Ichetucknee Springs State Park

Approved
Unit Management Plan

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL PROTECTION

Division of Recreation and Parks
April 2021

FLORIDA DEPARTMENT OF Environmental Protection

Marjory Stoneman Douglas Building
3900 Commonwealth Boulevard
Tallahassee, FL 32399

Ron DeSantis
Governor

Jeanette Nuñez
Lt. Governor

Noah Valenstein
Secretary

April 12, 2021

Mr. Steven Cutshaw
Division of Recreation and Parks
Department of Environmental Protection
3900 Commonwealth Boulevard, MS 525
Tallahassee, Florida 32399-3000

RE: Ichetucknee Springs State Park – Lease No. 2459

Dear Mr. Cutshaw,

On **April 9, 2021**, the Acquisition and Restoration Council (ARC) recommended approval of the **Ichetucknee Springs State Park** management plan. Therefore, Division of State Lands, Office of Environmental Services (OES), acting as agent for the Board of Trustees of the Internal Improvement Trust Fund, hereby approves the **Ichetucknee Springs State Park** management plan. The next management plan update is due April 9, 2031.

Pursuant to s. 253.034(5)(a), F.S., each management plan is required to "describe both short-term and long-term management goals and include measurable objectives to achieve those goals. Short-term goals shall be achievable within a 2-year planning period, and long-term goals shall be achievable within a 10-year planning period." Upon completion of short-term goals, please submit a signed letter identifying categories, goals, and results with attached methodology to the Division of State Lands, Office of Environmental Services.

Pursuant to s. 259.032(8)(g), F.S., by July 1 of each year, each governmental agency and each private entity designated to manage lands shall report to the Secretary of Environmental Protection, via the Division of State Lands, on the progress of funding, staffing, and resource management of every project for which the agency or entity is responsible.

Pursuant to s. 259.032, F.S., and Chapter 18-2.021, F.A.C., management plans for areas less than 160 acres may be handled in accordance with the negative response process. This process requires small management plans and management plan amendments be submitted to the Division of State Lands for review, and the Acquisition and Restoration Council (ARC) for public notification. The Division of State Lands will approve these plans or plan amendments submitted for review through delegated authority unless three

or more ARC members request the division place the item on a future council meeting agenda for review. To create better efficiency, improve customer service, and assist members of the ARC, the Division of State Lands will notice negative response items on Thursdays except for weeks that have State or Federal holidays that fall on Thursday or Friday. The Division of State Lands will contact you on the appropriate Friday to inform you if the item is approved via delegated authority or if it will be placed on a future ARC agenda by request of the ARC members.

Pursuant to s. 259.036(2), F.S., management areas that exceed 1,000 acres in size, shall be scheduled for a land management review at least every 5 years.

Conditional 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,

Deborah Burr
Office of Environmental Services
Division of State Lands

Ichetucknee Springs State Park

Lead Agency: Department of Environmental Protection
Division of Recreation and Parks

Common Name of Property: Ichetucknee Springs State Park

Location: Columbia and Suwannee counties

Acreage: 2,531.87 acres

Acreage Breakdown

Natural Communities	Acres
Mesic Flatwoods	3.58
Mesic Hammock	7.28
Sandhill	835.33
Sinkhole	0.43
Upland Hardwood Forest	323.39
Upland Mixed Woodland	960.06
Alluvial Forest	57.77
Dome Swamp	2.77
Floodplain Marsh	11.14
Floodplain Swamp	65.67
Sinkhole Lake	1.11
Blackwater Stream	0.53
Spring-Run Stream	27.49
Altered Landcover Types	
Clearing/Regeneration	1.09
Developed	55.77
Impoundment/Artificial Pond	0.25
Pine Plantation	118.03
Borrow Area	17.11
Spoil Area	16.74
Utility Corridor	15.11

Lease/Management Agreement Number: 2459

Use: Single Use

Management Responsibilities

Agency: Dept. of Environmental Protection, Division of Recreation and Parks

Responsibility: Public Outdoor Recreation and Conservation

Designated Land Use: Public outdoor recreation and conservation is the designated single use of the property.

Sublease: None

Encumbrances: Three powerline easements cross the Ichetucknee River near the South Takeout parking area. These easements were established decades prior to acquisition as a state park. An easement management plan developed in conjunction with Duke Power addresses maintenance, vegetation growth, and resource management needs for this utility corridor.

Unique Features

Overview: Ichetucknee Springs State Park is located in Columbia and Suwannee counties, five miles northwest of Fort White off U.S. Highway 27 and State Road 238. The park centers around the six-mile long Ichetucknee River. The park was initially acquired on January 6, 1970. Currently, the park comprises 2,531.87 acres.

The purpose of Ichetucknee Springs State Park is to provide opportunities for resource-based outdoor recreation and nature appreciation for the enjoyment of Florida residents and visitors, while protecting and preserving representative examples of upland karst topography, aquatic cave environments, and water resources within the Ichetucknee and Santa Fe watersheds. Under the unit classification system, the park is classified as a state park.

Natural: The park encompasses 3.5 miles of the Ichetucknee River, am iconic and hydrologically significant spring-run stream including eight major springs as well as numerous seeps, before flowing into the Santa Fe River. The most prominent aquatic karst features are two picturesque first and second magnitude springs – the Ichetucknee Headspring and Blue Hole. Upland areas of the park protect large tracts of hardwood forest, sandhill, floodplain forest, and marsh, which are critical aquifer recharge areas within the regional springshed and form a remarkable landscape for hiking, wildlife observation, and interpretation of the Gulf Coastal Lowlands environment. The Ichetucknee Trace tracts of the park protect three distinct hydrogeologic features, including Rose, McCormick, and Saylor sinks, remarkable for deep karst depressions, swallets, and prominent limestone outcroppings.

Archaeological/Historic: The park preserves various archaeological and historic sites spanning the Weeden Island period through Spanish Mission occupation to 20th century tobacco homesteads.

Management Goals, Objectives and Actions

Measurable objectives and actions have been identified for each of the Division's management goals for Ichetucknee Springs State Park. Please refer to the Implementation Schedule and Cost Estimates in the Implementation Component of this plan for a consolidated spreadsheet of the recommended actions, measures of progress, target year for completion, and estimated costs to fulfill the management goals and objectives of this park.

While the Division of Recreation and Parks utilizes the ten-year management plan to serve as the basic statement of policy and future direction for each park, various annual and short-term work plans provide more specific guidance for DRP staff to accomplish many of the resource management goals and objectives of the park. Where such detailed planning is appropriate to the character and scale of the park's natural resources, annual work plans are developed for prescribed fire management, exotic plant management, and

imperiled species management. Annual or longer-term work plans are developed for natural community restoration and hydrological restoration.

The work plans provide the DRP with crucial flexibility in its efforts to generate and implement adaptive resource management practices in the state park system. The work plans are reviewed and updated annually. Through this process, the resource management strategies of the DRP are systematically evaluated to determine their effectiveness. The process and the information collected is used to refine techniques, methodologies and strategies, and ensures that each park's prescribed management actions are monitored and reported as required by Chapters 253.034 and 259.037, Florida Statutes. The goals, objectives and actions identified in this management plan will serve as the basis for developing annual work plans for the park. Since the plan is based on conditions that exist at the time the plan is developed, the annual work plans will provide the flexibility needed to adapt to future conditions as they change during the ten-year management planning cycle. As the park's annual work plans are implemented through the ten-year cycle, it may become necessary to adjust the management plan's priority schedules and cost estimates to reflect these changing conditions.

Natural Resource Management

Hydrological Management

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

- *Objective: Conduct/obtain an assessment of the park's hydrological restoration needs.*
- *Objective: Restore natural hydrological conditions and functions to approximately 10 acres of spring-run stream natural community.*
- *Objective: Evaluate impacts of visitor use on the Ichetucknee River system and mitigate as needed.*

Natural Communities Management

Goal: Restore and maintain the natural communities/habitats of the park.

- *Objective: Within 10 years, have 1,460 acres of the park maintained within the optimum fire return interval.*
- *Objective: Conduct habitat/natural community restoration activities on 225 acres of upland pine and upland mixed woodland natural communities.*
- *Objective: Conduct habitat/natural community improvement activities on 25 acres of sandhill community.*

Imperiled Species Management
Goal: Maintain, improve or restore imperiled species populations and habitats in the park.

- *Objective: Monitor and document seven selected imperiled animal species in the park.*
- *Objective: Compile and convert imperiled species distribution and abundance data into electronic format in a geospatial database.*
- *Objective: Monitor and document two selected imperiled plant species in the park.*

Exotic Species Management
Goal: Remove exotic and invasive plants and animals from the park and conduct needed maintenance control.

- *Objective: Annually treat 10 acres of exotic plant species in the park.*
- *Objective: Develop and implement measures to prevent the accidental introduction or further spread of invasive exotic plants in the park.*
- *Objective: Implement control measures on a minimum of three nuisance and exotic animal species in the park.*

Cultural Resource Management

Cultural Resource Management
Goal: Protect, preserve and maintain the cultural resources of the park.

- *Objective: Assess and evaluate 25 of 55 recorded cultural resources in the park.*
- *Objective: Compile reliable documentation for all recorded historic and archaeological sites.*
- *Objective: Bring 6 of 58 recorded cultural resources into good condition.*

Listing, projected timeframes, and estimated costs of natural and cultural resource management goals, objectives, and actions included in the implementation spreadsheet of the Implementation Component.

Acquisition Needs/Acreage: Approximately 8,500 acres has been identified as desirable for addition to Ichetucknee Springs State Park. The majority of the additional land lies to the northwest of the park and contains significant examples of longleaf pine and xeric oak sandhill community. If acquired, the area will offer additional protected territory for listed species, such as the southern fox squirrel and the Southeastern American kestrel, and other species. Several aquatic caves exist within the area, which have been demonstrated to share hydrological connections with the park's springs. The recommended additions north of the park have a significant and demonstrated relationship with the spring system. Potential agricultural or urban development near the park may alter long-term resource conservation and restoration goals. Acquisition of these recommended areas will help to protect

surface and groundwater flows into the Ichetucknee Springs and River. Lands immediately adjacent to the park on the east, south, and west boundaries are considered significant for each of the identified reasons. These areas also contain resource elements that will complement the recreational opportunities currently found within Ichetucknee Springs State Park.

Surplus Lands/Acreage: No lands are considered surplus to the management needs or public interests of this state park.

Public Involvement: DRP provided opportunities for public input by conducting a public hearing and an advisory group meeting to present the draft management plan to the public. These meetings were held on Wednesday, March 29 and Thursday, March 30, 2017, respectively. Meeting notices were published in the Florida Administrative Register, March 19, 2017, Volume 43, Issue 54, included on the Department Internet Calendar, posted in clear view at the park, and promoted locally. The purpose of the advisory group meeting is to provide the Advisory Group members an opportunity to discuss the draft management plan (see Addendum 2).

On Tuesday, December 15, 2020, the DRP conducted an additional public forum in a virtual format to present new management strategies for river access and aquatic resource protection and to hear public comments regarding the proposed changes included in the management plan update. This forum was publicly noticed, promoted among regional stakeholders and the general public, and recorded, with the digital recording made available online for public viewing after the live session.

Summary of Significant Changes in the Management Plan Update

Change in Land Use and Recreation Access Goals:

New and improved facilities have been proposed that are appropriate for this park and consistent with the DRP mission. These include:

- Construct additional picnic facilities, expanded restrooms, bathhouse, and improved walkways.
- Safety improvements and renovations to access facilities along boardwalks and walkways to the existing river access points/tube launches at Midpoint and Dampier's Landing.
- Addition of up to six small picnic shelters is proposed in the vicinity of the restrooms, and swimming area.
- Redesign North Use Area to better integrate the picnic shelters, restrooms, and pedestrian access to the river access point.
- Develop new hiking trails parkwide to connect the North and South use areas.

Given the longitudinal data on submerged aquatic vegetation coverage and diversity, erosion, turbidity, water levels, and water quality – the best management action for protection of the upper Ichetucknee River is to:

- Remove all tubing from the upper river, i.e., from North Launch to Midpoint.
- Reallocate the current carrying capacity of 750 tubers per day to the lower river, i.e., Midpoint to South Takeout.
- Maintain the current carrying capacity of 2,250 tubers per day between Midpoint and South Take-out, i.e., total daily capacity of 3,000 persons south of Midpoint (*750 from upper + 2,250 on lower*).

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INTRODUCTION

Ichetucknee Springs State Park is located in Columbia and Suwannee counties, five miles northwest of Fort White off U.S. Highway 27 and State Road 238. The park centers around the six-mile long Ichetucknee River, a major tributary of the Santa Fe River (see Vicinity and Reference maps). The Vicinity Map also reflects significant land and water resources existing near the park.

Ichetucknee Springs State Park was initially acquired on January 6, 1970. Currently, the park comprises 2,531.87 acres. The Board of Trustees of the Internal Improvement Trust Fund (Trustees) holds fee simple title to the park and on September 4, 1970, the Trustees leased (Lease Number 2459) the property to DRP under a 99-year lease. The current lease will expire on September 3, 2069.

Ichetucknee Springs State Park is designated single-use to provide public outdoor recreation and other park-related uses. There are no legislative or executive directives that constrain the use of this property (see Addendum 1).

Purpose and Significance of the Park

The purpose of Ichetucknee Springs State Park is to provide opportunities for resource-based outdoor recreation and nature appreciation for the enjoyment of Florida residents and visitors, while protecting and preserving representative examples of upland karst topography, aquatic cave environments, and water resources within the Ichetucknee and Santa Fe watersheds.

Park Significance

- The park encompasses 3.5 miles of the Ichetucknee River, an iconic spring-run stream supplied by eight major springs as well as numerous karst seeps from the Floridan aquifer.
- The park provides recreational access to two picturesque first and second magnitude springs – Ichetucknee Head Spring and Blue Hole.
- The park protects large tracts of upland mixed woodland and sandhill, which are critical aquifer recharge areas within the regional springshed and form a remarkable landscape for hiking, wildlife observation, and interpretation of natural areas in Suwannee River region of northeast Florida.
- The park protects a diversity of rare plant species and cave invertebrates, as well as the only known population of the Ichetucknee siltsnail.
- The park preserves various archaeological and historic sites over a timespan ranging from the Weeden Island period through Spanish Mission occupation to 20th century tobacco homesteads.
- The Ichetucknee Trace tracts of the park protect three distinct hydrogeologic features - Rose, McCormick, and Saylor sinks – in a remarkable karst landscape of prominent limestone outcroppings and deep depressions and swallets with direct connections to underground conduits that supply the Ichetucknee springs complex.

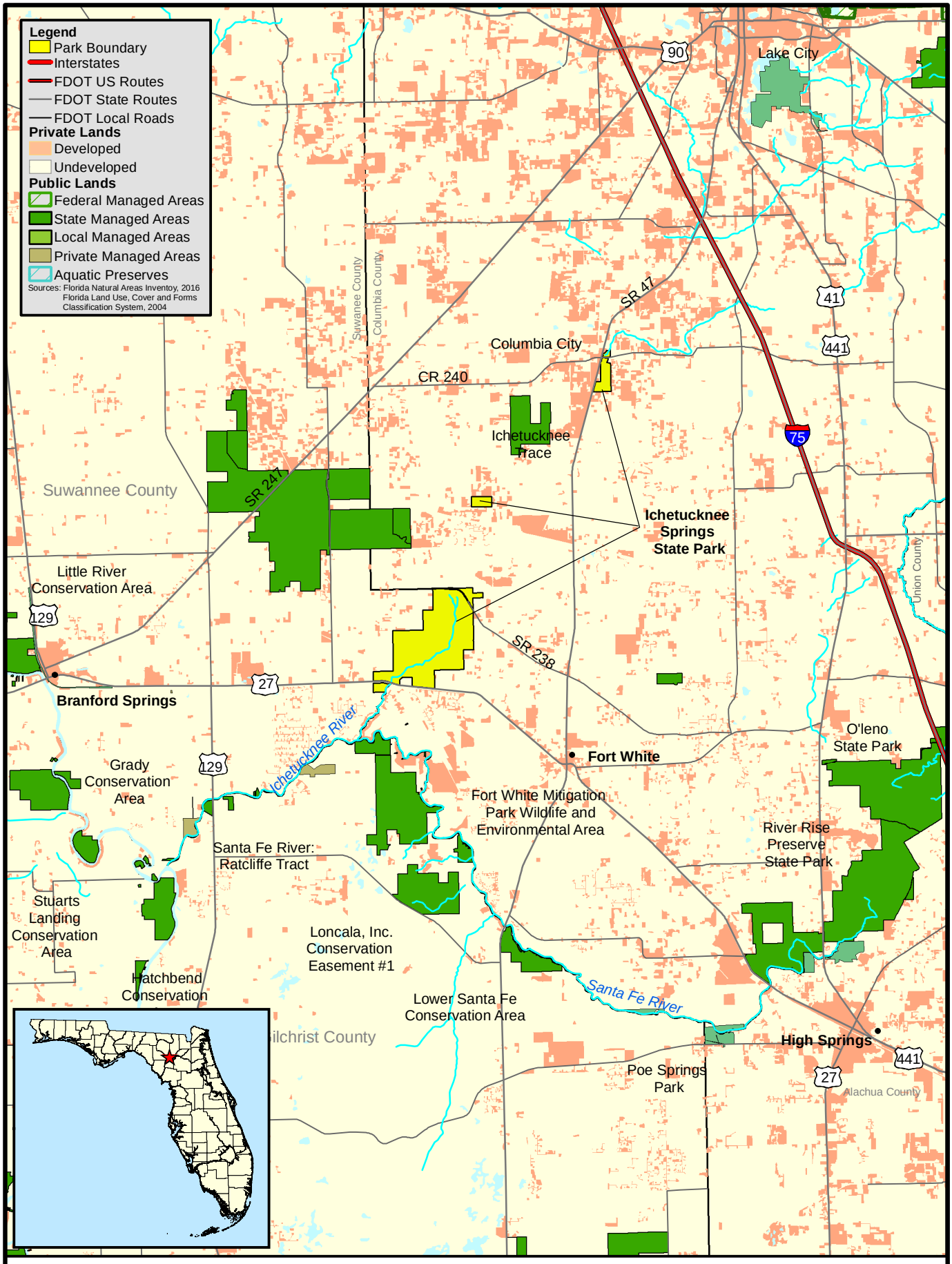
Ichetucknee Springs State Park is classified as a state park in the DRP unit classification system. In the management of a state park, balance is sought between the goals of maintaining and enhancing natural conditions and providing various recreational opportunities. Natural resource management activities are aimed at management of natural systems. Development is directed toward providing public access to and within the park, and to providing recreation facilities, in a reasonable balance and convenient and safe manner. Program emphasis is on interpretation of the park's natural, aesthetic, and educational attributes.

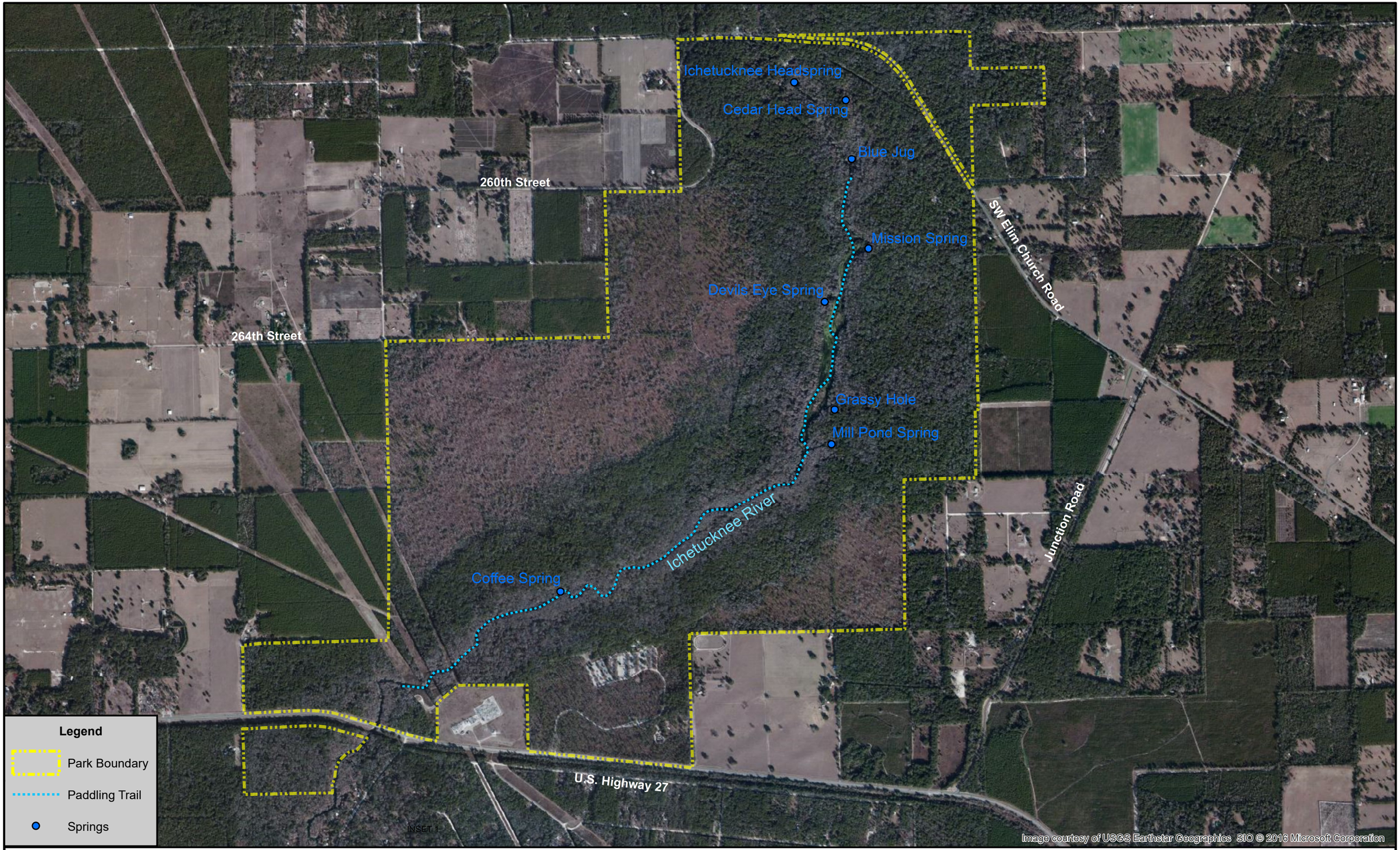
Purpose and Scope of the Plan

This plan serves as the basic statement of policy and direction for the management of Ichetucknee Springs State Park as a unit of Florida's state park system. It identifies the goals, objectives, actions and criteria or standards that guide each aspect of park administration and sets forth the specific measures that will be implemented to meet management objectives and provide balanced public utilization. The plan is intended to meet the requirements of Sections 253.034 and 259.032, Florida Statutes, Chapter 18-2, Florida Administrative Code, and is intended to be consistent with the State Lands Management Plan. With approval, this management plan will replace the 2000 approved plan.

The plan consists of three interrelated components: Resource Management Component, Land Use Component, and Implementation Component. The Resource Management Component provides a detailed inventory and assessment of the existing natural and cultural resources of the park. Resource management needs and issues are subsequently identified, and measurable management objectives are established for each of the park’s management goals and resource types. This component provides guidance on the application of such measures as prescribed burning, exotic species removal, imperiled species management, cultural resource management, and restoration of natural conditions.

The Land Use Component is the recreational resource allocation plan for the park. Based on considerations such as access, population, adjacent land uses, the natural and cultural resources of the park, and current public uses and existing development, measurable objectives are set to achieve the desired allocation of the physical space of the park. These objectives identify use areas and propose the types of facilities and programs as well as the volume of public use to be provided.


Legend
Park Boundary
Interstates
FDOT US Routes
FDOT State Routes
FDOT Local Roads
Private Lands
Developed
Undeveloped
Public Lands
Federal Managed Areas
State Managed Areas
Local Managed Areas
Private Managed Areas
Aquatic Preserves
Sources: Florida Natural Areas Inventoy, 2016
Florida Land Use, Cover and Forms
Classification System, 2004
Lake City
90
Columbia City
CR 240
SR 47
41
441
75
Suwannee County
Columbia County
Union County
Alachua County
Gilchrist County
SR 247
Ichetucknee Trace
Ichetucknee Springs State Park
Little River Conservation Area
129
27
SR 238
Branford Springs
Ichetucknee River
Fort White
O'leno State Park
Grady Conservation Area
Fort White Mitigation Park Wildlife and Environmental Area
River Rise Preserve State Park
Santa Fe River: Ratcliffe Tract
Stuarts Landing Conservation Area
Loncala, Inc. Conservation Easement #1
Hatchbend Conservation
Lower Santa Fe Conservation Area
Santa Fe River
High Springs
Poe Springs Park
ICHETUCKNEE SPRINGS STATE PARK
N
0
1.25
2.5
5 Miles
Florida Department of Environmental Protection
Division of Recreation and Parks
VICINITY MAP



Legend

- Park Boundary
- Paddling Trail
- Springs

ICHETUCKNEE SPRINGS STATE PARK

N

0 0.125 0.25 0.5 Miles

Florida Department of Environmental Protection
Division of Recreation and Parks
Date of aerial: 2011

REFERENCE MAP

The Implementation Component consolidates the measurable objectives and actions for each of the park's management goals. An implementation schedule and cost estimates are included for each objective and action. Included in this table are (1) measures that will be used to evaluate the DRP's implementation progress, (2) timeframes for completing actions and objectives and, (3) estimated costs to complete each action and objective.

All development and resource alteration proposed in this plan is 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.

In the development of this plan, the potential of the park to accommodate secondary management purposes was analyzed. These secondary purposes were considered within the context of the DRP's statutory responsibilities and the resource needs and values of the park. This analysis considered natural and cultural resources, management needs, aesthetic values, visitation, and visitor experiences. For this park, it was determined that timber management activities, for natural community restoration purposes, could be accommodated in a manner that would be compatible and not interfere with the primary purpose of resource-based outdoor recreation and conservation. These compatible secondary management purposes are addressed in the Resource Management Component 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 park.

The potential for generating revenue to enhance management was also analyzed. Visitor fees and charges are the principal source of revenue generated by the park. It was determined that timber management, for natural community restoration purposes, would be appropriate at this park as additional sources of revenue for land management since they are compatible with the park's primary purpose of resource-based outdoor recreation and conservation.

DRP may provide the services and facilities outlined in this plan either with its own funds and staff or through an outsourcing contract. Private contractors may provide assistance with natural resource management and restoration activities or a concessionaire may provide services to park visitors in order to enhance the visitor experience. For example, a concessionaire could be authorized to sell merchandise and food and to rent recreational equipment for use in the park. A concessionaire may also be authorized to provide specialized services, such as interpretive tours, or overnight accommodations when the required capital investment exceeds that which DRP can elect to incur. Decisions regarding outsourcing, contracting with the private sector, the use of concessionaires, etc. are made on a case-by-case basis in accordance with the policies set forth in DRP's Operations Manual (OM).

Management Program Overview

Management Authority and Responsibility

In accordance with Chapter 258, Florida Statutes and Chapter 62D-2, Florida Administrative Code, the Division of Recreation and Parks (DRP) is charged with the responsibility of developing and operating Florida's recreation and parks system. These are administered in accordance with the following policy:

It shall be the policy of the Division of Recreation and Parks to promote the state park system for the use, enjoyment, and benefit of the people of Florida and visitors; to acquire typical portions of the original domain of the state which will be accessible to all of the people, and of such character as to emblemize the state's natural values; conserve these natural values for all time; administer the development, use and maintenance of these lands and render such public service in so doing, in such a manner as to enable the people of Florida and visitors to enjoy these values without depleting them; to contribute materially to the development of a strong mental, moral, and physical fiber in the people; to provide for perpetual preservation of historic sites and memorials of statewide significance and interpretation of their history to the people; to contribute to the tourist appeal of Florida.

The Board of Trustees of the Internal Improvement Trust Fund (Trustees) has granted management authority of certain sovereign submerged lands to the DRP under Management Agreement MA 68-086 (as amended January 19, 1988). The management area includes a 400-foot zone from the edge of mean high water where a park boundary borders sovereign submerged lands fronting beaches, bays, estuarine areas, rivers or streams. Where emergent wetland vegetation exists, the zone extends waterward 400 feet beyond the vegetation. The agreement is intended to provide additional protection to resources of the park and nearshore areas and to provide authority to manage activities that could adversely affect public recreational uses.

Many operating procedures are standardized system-wide and are set by internal direction. These procedures are outlined in the OM that covers such areas as personnel management, uniforms and personal appearance, training, signs, communications, fiscal procedures, interpretation, concessions, public use regulations, resource management, law enforcement, protection, safety and maintenance.

Park Management Goals

The following park goals express DRP's long-term intent in managing the state park:

- Provide administrative support for all park functions.
- Protect water quality and quantity in the park, restore hydrology to the extent feasible and maintain the restored condition.
- Restore and maintain the natural communities/habitats of the park.
- Maintain, improve or restore imperiled species populations and habitats in the park.
- Remove exotic and invasive plants and animals from the park and conduct needed maintenance-control.
- Protect, preserve and maintain the cultural resources of the park.
- Provide public access and recreational opportunities in the park.
- Develop and maintain the capital facilities and infrastructure necessary to meet the goals and objectives of this management plan.

Management Coordination

The park is managed in accordance with all applicable laws and administrative rules. Agencies having a major or direct role in the management of the park are discussed in this plan.

The Florida Department of Agriculture and Consumer Services (FDACS), Florida Forest Service (FFS), 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 (FWC) assists staff in the enforcement of state laws pertaining to wildlife, freshwater fish and other aquatic life existing within the park. In addition, the FWC aids DRP with wildlife management programs, including imperiled species management. The Florida Department of State (FDOS), Division of Historical Resources (DHR) assists staff to ensure protection of archaeological and historical sites. The Florida Department of Environmental Protection (DEP), Florida Coastal Office (FCO) aids staff in aquatic preserves management programs. The DEP, Bureau of Beaches and Coastal Systems aids staff in planning and construction activities seaward of the Coastal Construction Control Line (CCCL). In addition, the Bureau of Beaches and Coastal Systems aid the staff in the development of erosion control projects.

Public Participation

DRP provided an opportunity for public input by conducting a public hearing and an advisory group meeting to present the draft management plan to the public. These meetings were held on Wednesday, March 29 and Thursday, March 30, 2017, respectively. Meeting notices were published in the Florida Administrative Register, March 19, 2017, Volume 43, Issue 54, included on the Department Internet Calendar, posted in clear view at the park, and promoted locally. The purpose of the advisory group meeting is to provide the Advisory Group members an opportunity to discuss the draft management plan (see Addendum 2).

On Tuesday, December 15, 2020, the DRP conducted an additional public forum in an interactive virtual format to present new management strategies for river access and aquatic resource protection and to hear public comments regarding the proposed changes included in the management plan update. This forum was publicly noticed, promoted among regional stakeholders and the general public, and recorded, with the digital recording made available online for public viewing after the live session.

Other Designations

Ichetucknee Springs State Park is not within an Area of Critical State Concern as defined in Section 380.05, Florida Statutes, and it is not presently under study for such designation. The park is a component of the Florida Greenways and Trails System, administered by the Department's Office of Greenways and Trails.

The Ichetucknee River within the state park has been designated as a National Natural Landmark and also as an Outstanding Florida Spring.

All waters within the park have been designated as Outstanding Florida Waters, pursuant to Chapter 62-302, Florida Administrative Code. Surface waters in this park are also classified as Class III waters by the Department. This park is not within or adjacent to an aquatic preserve as designated under the Florida Aquatic Preserve Act of 1975 (Section 258.35, Florida Statutes).

RESOURCE MANAGEMENT COMPONENT

INTRODUCTION

In accordance with Chapter 258, Florida Statutes, the Division of Recreation and Parks has implemented resource management programs for preserving for all time the representative examples of natural and cultural resources of statewide significance under its administration. This component of the unit plan describes the natural and cultural resources of the park and identifies the methods that will be used to manage them. The management measures expressed in this plan are consistent with the Department's overall mission in ecosystem management. Cited references are contained in Addendum 3.

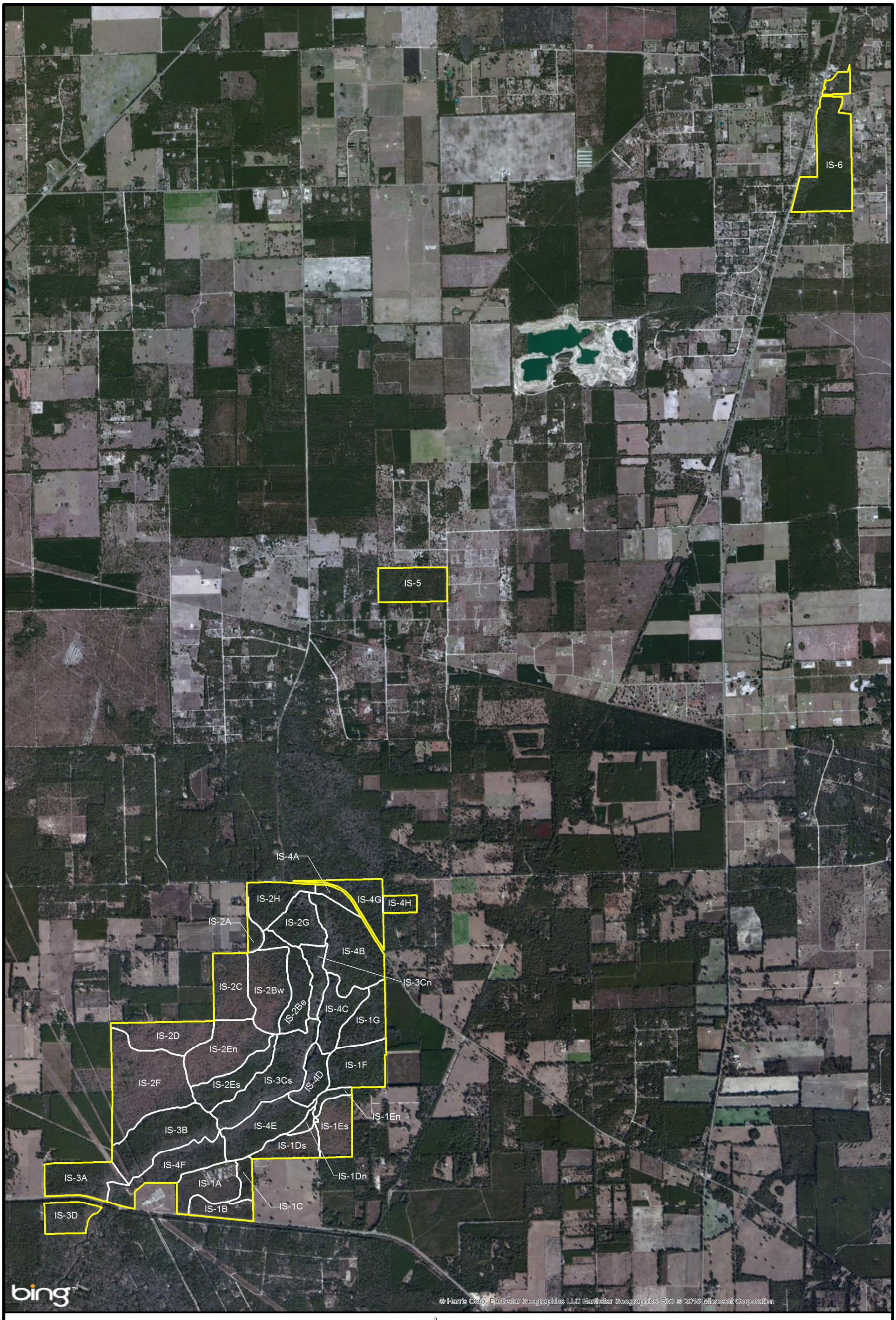
The DRP philosophy of resource management is natural systems management. Primary emphasis is placed on restoring and maintaining, to the degree possible, the natural processes that shaped the structure, function and species composition of Florida's diverse natural communities as they occurred in the original domain. Single species management for imperiled species is appropriate in state parks when the maintenance, recovery, or restoration of a species or population is complicated due to constraints associated with long-term restoration efforts, unnaturally high mortality, or insufficient habitat. Single species management should be compatible with the maintenance and restoration of natural processes, and should not imperil other native species or substantially compromise park values.

The DRP management goal for cultural resources is to preserve sites and objects that represent Florida's cultural periods, significant historic events, or persons. This goal often entails active measures to stabilize, reconstruct or restore resources, or to rehabilitate them for appropriate public use.

Because park units are often components of larger ecosystems, their proper management can be affected by conditions and events that occur beyond park boundaries. Ecosystem management is implemented through a resource management evaluation program that assesses resource conditions, evaluates management activities and refines management actions, and reviews local comprehensive plans and development permit applications for park/ecosystem impacts.

The entire park is divided into management zones, which delineate areas on the ground that are used to reference management activities (see Management Zones Map). The shape and size of each zone may be based on natural community types, burn zones, and the location of existing roads and natural fire breaks. It is important to note that all burn zones are management zones; however, not all management zones are burn zones or include fire-dependent natural communities. Table 1 reflects the management zones with the acres of each zone.

Table 1. Ichetucknee Springs State Park Management Zones			
Management Zone	**Acreage**	**Managed with Prescribed Fire**	**Contains Known Cultural Resources**
IS-1A	73.83	Y	Y
IS-1B	38.33	Y	Y
IS-1C	20.88	Y	Y
IS-1Dn	9.33	Y	Y
IS-1Ds	49.34	Y	Y
IS-1En	13.14	Y	Y
IS-1Es	67.47	Y	Y
IS-1F	82.04	Y	Y
IS-1G	65.77	Y	Y
IS-2A	15.10	Y	Y
IS-2Be	74.65	Y	Y
IS-2Bw	100.92	Y	Y
IS-2C	81.80	Y	Y
IS-2D	83.23	Y	Y
IS-2En	114.78	Y	Y
IS-2Es	69.75	Y	Y
IS-2F	189.05	Y	Y
IS-2G	66.29	Y	Y
IS-2H	64.20	Y	Y
IS-3A	80.60	Y	Y
IS-3B	142.35	Y	Y
IS-3Cn	39.07	Y	Y
IS-3Cs	137.27	Y	Y
IS-3D	48.70	Y	Y
IS-4A	17.42	Y	Y
IS-4B	144.88	Y	Y
IS-4C	68.34	Y	Y
IS-4D	45.92	Y	Y
IS-4E	100.02	Y	Y
IS-4F	101.73	Y	Y
IS-4G	55.78	Y	Y
IS-4H	19.72	Y	Y
IS-5	80.67	Y	UNK
IS-6	169.59	Y	Y



ICHETUCKNEE SPRINGS
STATE PARK

N

0 0.25 0.5 1 Miles

Florida Department of Environmental Protection
Division of Recreation and Parks
Date of aerial: 2011

MANAGEMENT ZONES
MAP

RESOURCE DESCRIPTION AND ASSESSMENT

Natural Resources

Topography

Ichetucknee Springs State Park lies in a physiographic region called the Coastal Lowlands, which is described as a low karst plain with elevations typically less than 100 feet above mean sea level (msl) (White 1970). Complete and rapid infiltration of runoff is characteristic of the drainage within this region. Lakes and wetlands are relatively infrequent. Sinkholes are quite numerous but tend to be small in area. Northward of the Coastal Lowlands is the Northern Highlands region, which is an upland area capped by relatively impermeable, clay-rich sediments with elevations typically greater than 150 feet above msl. The Northern Highlands are relatively flat and karst development is minor. Drainage in this region, in contrast with that of the Coastal Lowlands, is characterized by considerable surface water runoff and a more extensive development of lakes and wetlands (Champion and Upchurch 2003).

Between these two physiographic regions, about halfway between the headwaters of the Ichetucknee River and the town of Lake City in Columbia County, is a transitional zone containing an important karst feature known as the Cody Escarpment, familiarly known as the Cody Scarp (Puri and Vernon 1964). This escarpment is one of many analogous geologic features located in the northern half of the state that share similar geological, geomorphic and hydrological characteristics (Upchurch 2002). The Cody Scarp has an abundance of sinkholes, sinkhole lakes and sinking streams (swallets), topographic features that profoundly affect the hydrology of the region. Elevations along the section of scarp that lies northeast of the Ichetucknee River typically range between 100 and 150 feet above msl.

The Ichetucknee Trace is a topographic anomaly of a former stream valley of the Ichetucknee River created as erosion processes shaped the retreat of the Cody Scarp (Champion and Upchurch 2003). The Trace stretches north/northeast from the Ichetucknee River to the Lake City area, which is located in the southern portion of the Northern Highlands. Elevations within the Trace typically range from 50 to 70 feet above msl. Recent acquisition efforts in the Ichetucknee Trace region have resulted in the addition of several important parcels to the park, including the McCormick Sink, Rose Sink, and Saylor Sink properties. Each of these parcels contains portions of the ancient riverbed as well as sinkhole lakes (karst windows) that open into extensive subterranean water conduits running beneath the Trace. These conduits are hydrologically linked with the Ichetucknee Springs system.

Elevations within Ichetucknee Springs State Park range from less than 20 feet (msl) along the river floodplain to over 85 feet (msl) on the McCormick parcel that lies northeast of the main park (see Topographic Map). Slopes are gradual in some areas, abrupt in others. Limestone outcrops are common, particularly along the

upper edge of the floodplain and along much of the riverbank. Noticeable alterations of the natural landscape include roads and firebreaks; multiple historic phosphate pits and settling ponds; old tram beds; and a long disused borrow pit in the southwest corner of the park.

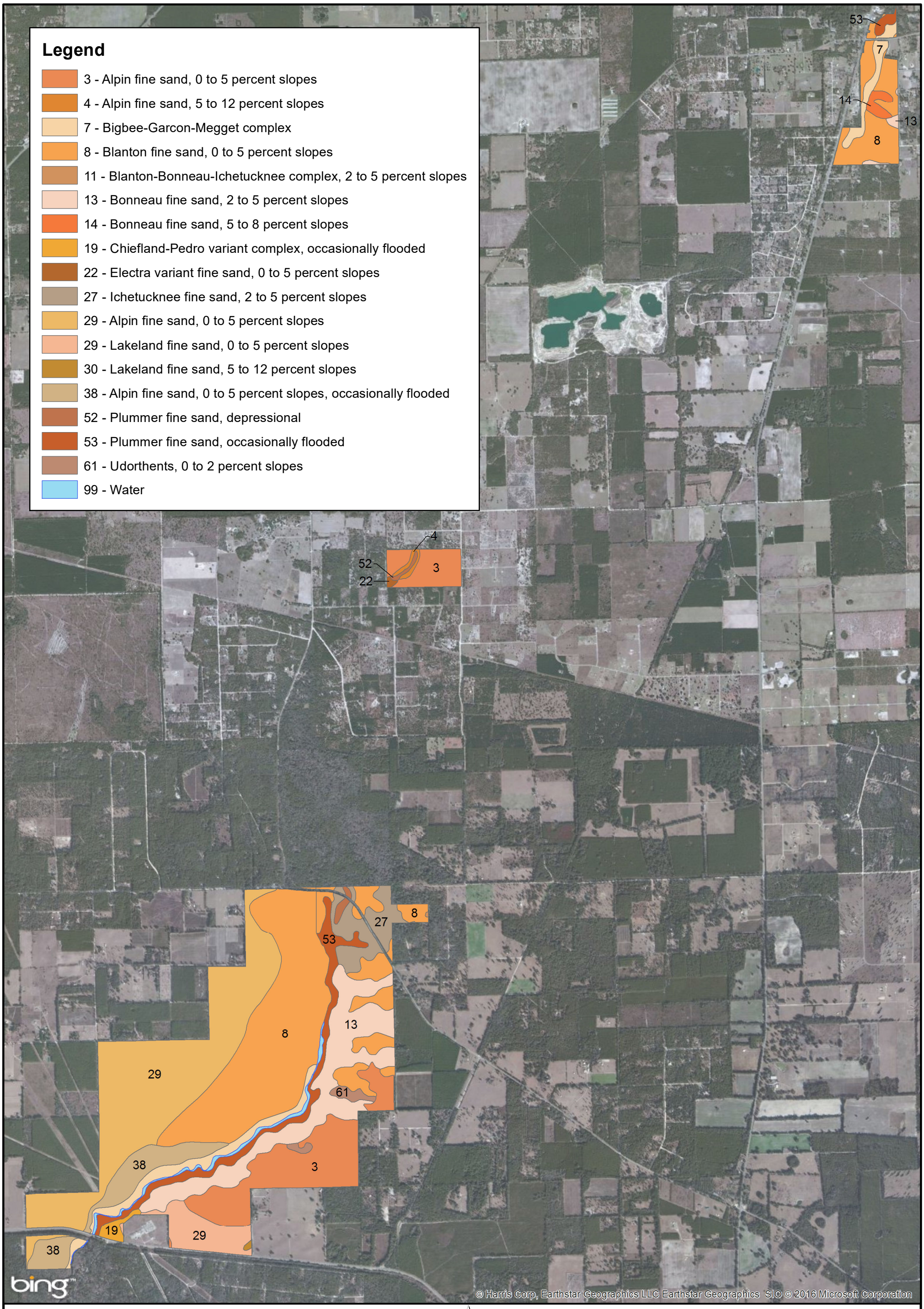
The phosphate mining operations at Ichetucknee Springs, which occurred in two phases, had a major effect on the topographic features of the park. In the first phase, during the phosphate boom era of the late 1800s and early 1900s, the Dutton Phosphate Company opened the majority of the phosphate pits on the property and extracted hard rock phosphate. Most of the extraction was accomplished by hand and the ore was transported to Fort White or High Springs via narrow gauge rail cars on the numerous tram roads that were constructed in the region (Doig 1992). Although Loncala Phosphate, Inc. acquired the property in the 1920s, it did not mine additional phosphate until the 1950s, when the company reopened the old pits and scraped them to reclaim colloidal phosphate residues. It was at this time that the settling or "slime" ponds were constructed (Doig 1992).

Geology

Geological formations in the Florida carbonate platform are divided into both lithologic and hydrologic units because aquifers cut across formational boundaries. The limestone exposed in the park belongs to the Ocala Group Limestone of Eocene age. This formation is approximately 40 million years old. Regionally, three other formations of Eocene age lie beneath the Ocala Group. From youngest to oldest, these are the Avon Park Limestone, Lake City Limestone and Oldsmar Limestone. A Paleocene deposit, the Cedar Keys Limestone, is located below those Eocene formations (Meyer 1962).

Ordinarily, formations of more recent age than the Ocala Group, such as Suwannee Limestone of Oligocene age and the Hawthorn Formation of Miocene age, would overlie the Ocala Group, but these have either never developed here or have completely eroded over time. Miocene deposits are carbonates with minor siliciclastics, while younger formations are largely siliciclastics with minor discontinuous carbonate lenses. Miocene-aged siliciclastic rocks make up the Hawthorn Formation, which acts as the confining unit for the Floridan aquifer. Erosion has removed the Miocene-aged and younger sediments that once overlaid the Ocala Group in much of the western half of north-central Florida, leaving the Floridan aquifer unconfined there (Meyer 1962). The erosional edge of the Hawthorn Formation, also known as the Cody Escarpment, is located just northeast the Ichetucknee River. The Cody Escarpment is a major influence on the geology of the region and represents the boundary between the confined and unconfined Floridan aquifers (Skiles et al. 1991).

The Ichetucknee Trace is a transitional area between the Northern Highlands and Gulf Coastal Lowlands and is an area of active karst solution. Within the Trace, multiple creeks flow underground in the form of confluent insurgence. These sinking points convey carbon dioxide enriched waters through conduits into the top layers of the Ocala Group Limestone. As a meandering surface feature, the Trace extends



ICHETUCKNEE SPRINGS
STATE PARK

N

0 0.25 0.5 1 Mile

Florida Department of Environmental Protection
Division of Recreation and Parks
Date of aerial; 2011

SOILS MAP

north-northeast from the Ichetucknee Headspring to the Lake City area. It constitutes a pathway for a series of surface and groundwater conduit connections that ultimately feed the Ichetucknee River from its northerly headwaters. Regardless of its geomorphology, the Trace is a zone of increased permeability, and carries a high vulnerability and high recharge classification (Skiles et al. 1991).

The only major disturbance of the park's geological formations has been the extraction of phosphate. Just outside the park, some limestone mining operations continue. Three miles west of the park is an active quarry associated with a cement manufacturing facility. Limestone extraction at this quarry could affect park resources if the mining has a negative impact on regional groundwater resources. Also of concern are limestone mines located north of the park in the Ichetucknee Trace. A continuation of mining in the Trace would have elevated the risk of severing a major conduit system, which could have had a devastating effect on the water clarity and quality of springs associated with that conduit system. For that reason, the State of Florida acquired the mines, which were placed under the management of the Office of Greenways and Trails. The property is currently managed by the DRP as a satellite of Ichetucknee Springs State Park.

Soils

Fifteen soil types are mapped within the Columbia County portion of the park (Howell 1984) and four types are mapped within the Suwannee County portion (Houston 1965). A different soil numbering system was used in each county, so it may appear that the soil type on one side of the county line is different from that just across the line, when in fact they may be the same (see Soils Map). Park soils range from excessively well drained sands in the sandhills to poorly drained mine tailings adjacent to phosphate pits and poorly drained alluvial soils in floodplain areas. Detailed soil descriptions are contained in Addendum 4.

Historical soil disturbances at the park are primarily restricted to phosphate mining areas and include many deep mine pits and several elevated tram roads. Agricultural fields once covered large areas in the McCormick Sink and Saylor Sink parcels.

More recently, foot traffic from recreational users has had an impact on the park. Many of the park's limestone bluffs, particularly those at the river's edge, have been elaborately sculpted by flowing water and upland runoff. Recreational users of the river have discovered that some these bluffs, as at Devil's Den, may be attractive resting areas. Unfortunately, the resulting foot traffic causes increased erosion of the bluffs and may damage the delicate limestone formations. Foot traffic also damages vegetation that clings to the calcareous soils of the unstable bluffs. Management activities in the park will follow generally accepted best management practices to prevent further soil erosion and conserve soil and water resources on site.

Minerals

Phosphate mining occurred on uplands along the Ichetucknee River prior to state acquisition as a park in 1970. Hard rock phosphate was extracted during the phosphate boom era of the late 1800s. Subsequent phosphate operations in the area reprocessed some of the residues from the original operations. It is likely that phosphate deposits remain within the park, but the economic value of the deposits is unknown. Commercially viable limestone deposits occur within the Ichetucknee Trace and in areas west of the park.

Hydrology

The Ichetucknee River watershed, measuring approximately 200 square miles, is a hydrologic unit of the Santa Fe River watershed (Champion and Upchurch 2003; Hunn and Slack 1983; Fernald and Purdum 1998). The Ichetucknee Springs groundwater basin is a recently delineated, subsurface hydrologic feature that covers up to 400 square miles (Sepulveda et al., 2006; Wetland Solutions Inc. 2010). Together, the surface watershed and groundwater basin make up the Ichetucknee springshed. Hydrologists have assigned a 900-square mile study area within central and southern Columbia County and eastern Suwannee County as being important for our understanding of the entire Ichetucknee springshed. Smaller portions of the Ichetucknee springshed extend into western Baker County and northwestern Union County.

The regional karst feature that defines surface and groundwater geologic, geomorphic and hydrologic characteristics of this springshed is the Cody Escarpment (Puri and Vernon 1964; Upchurch and Champion 2002; Upchurch 2002; White 1970). The Cody Scarp within the Ichetucknee springshed contains numerous karst dominated features such as sinkholes, swallets and sinking streams (Means and Scott 2005; Copeland 2003). A large portion of the surface runoff from the Northern Highlands drains across the Cody Scarp and becomes groundwater as it rapidly infiltrates subsurface limestone conduits of the Upper Floridan aquifer. Groundwater within the Ichetucknee springshed moves through a complex matrix of disjointed, and sometimes linked, underground conduits that may return the water to the surface through springs along the Ichetucknee River (Martin and Screaton 2001). Dye trace studies have revealed that surface runoff in the Ichetucknee springshed often moves very rapidly from inputs at these surface karst features to exit points at springs (Karst Environmental Services 1997; Butt and Murphy 2003).

The northern limit of the Ichetucknee springshed is the southwestern portion of Osceola National Forest, while the southernmost extent is the mouth of the Ichetucknee River where it meets the Santa Fe River. In the Osceola Forest region of the springshed, many small cypress and bay dominated wetlands exist at 98 to 190 feet above msl. These wetlands drain to the west via tributaries of the Suwannee River, and to the southwest by sinking streams that disappear in sinkholes or swallets.

The most developed portion of the Ichetucknee springshed, Lake City, is also located in the northern extent. One of the most prominent surface water features in Lake City is Alligator Lake, which is part of a headwaters area that has direct connections to the Ichetucknee Springs, and therefore plays a crucial role in water quality issues for the springs. Previous studies have documented that eutrophic discharge plumes within the surficial aquifer may extend several miles beyond Alligator Lake. These plumes have the potential to infiltrate underground conduits that eventually connect with the Ichetucknee Springs. Dye trace studies have shown that groundwater can travel up to a mile each day in the Ichetucknee Basin (Champion and Upchurch 2003). In addition to Alligator Lake, several sinking streams, including Rose Creek, drain upland surface waters as they cross the Cody Scarp.

Ichetucknee Trace

The Ichetucknee Trace is a meandering, surface landscape feature that follows lower elevation topographic contours extending between Lake City and the Ichetucknee River. The Trace encompasses an area of active karst solution and contains multiple, highly intermittent sinking streams whose flow can go underground and mix with the Upper Floridan aquifer (Upchurch and Champion 2004). During extreme flooding events when the volume of water entering the sinking streams exceeds their capacity, the excess water begins to flow overland and may even flood this normally dry surface feature along its entire length (Champion and Upchurch 2003). This type of flood event happened historically in the Ichetucknee Trace, with the most recent occurrence in September 2004 following Hurricane Frances. Hydrological evidence now indicates that the Ichetucknee Trace delineates a former stream valley of a once considerably longer Ichetucknee River, and that it has a complicated underground conduit system with surface and groundwater connections (Martin and Screaton 2001; Champion and Upchurch 2003). Additional evidence, according to Milanich and Hudson (1993), is an 1829 regional map that depicts the Trace as a former river valley. Underground conduit systems throughout the Trace may connect directly to various individual springs in the Ichetucknee system (Skiles et al. 1991; Hirth 1995; Karst Environmental Services 1997; Gordon 1998; Butt and Murphy 2003; Butt 2005). The complex mixing of surface water and groundwater of various ages within the Ichetucknee River watershed tends to complicate assessments of spring ecosystem health and vulnerabilities (Katz and Hornsby 1998; Katz et al., 1999).

Since approval of the last Ichetucknee unit management plan in 2000, the state has made considerable progress in acquiring key parcels within the Ichetucknee Trace. Three significant purchases include the Rose Sink and McCormick Sink parcels in the Columbia City area, and Saylor Sink about two miles north of the Ichetucknee Headspring. The DRP manages all three as part of Ichetucknee Springs State Park. In addition, in 2000 and 2001 respectively, the state acquired the Anderson and Kirby limerock mines. They are managed by the DRP as a satellite of the park.

The Rose Sink cave system includes two distinct surface water features located at the northeast corner of the intersection of County Roads 47 and 240, Rose Sink and Rose Creek Swallet (Butt and Murphy 2003). Rose Creek Swallet is a sinking point of Rose Creek, which is an intermittent stream that ceases to flow during periods of low rainfall. During normal flows, the swallet captures the entire stream, which generally drains an area southeast of Lake City. During periods of flooding, however, both Rose Creek Swallet and Rose Sink capture the flow of the creek. In essence, Rose Sink receives excess flow that the swallet cannot handle. Overflow swallets such as these are sometimes called midway swallets, and they occur along the entire length of the Ichetucknee Trace. Significant midway swallets in this region include Cannon, Clay Hole, Black, Dyal, Rose Creek, McCormick, Corbitt, and Saylor (Wes Skiles, Karst Environmental Services, pers. comm.).

Rose Creek Swallet, which lies roughly 200 feet northeast of Rose Sink, is currently the furthest upstream point in the Rose Creek cave system. The swallet is a circular cave, about 10 feet in diameter, with a maximum depth of 50 feet. Rose Sink is also circular, with a diameter of about 75 feet. It initially deepens to about 20 feet, but later stair-steps down to a maximum depth of 144 feet. The majority of the cave is about 140 feet deep. The main entrance to the system, located in a cave wall downstream from Rose Sink, is huge at 26 feet tall and 66 feet wide. About 700 feet downstream, however, the cave passage shrinks dramatically as it becomes a small bedding plane with intersecting joints. Several groundwater vents are located in the western wall of Rose Sink. These account for the sink's flow when Rose Creek is dry.

Rose Creek Swallet and Rose Sink are linked via a small passage named Swallet Tunnel, which connects to the main cave system approximately 70 feet southeast of the main cave entrance. Swallet Tunnel is a 10-foot diameter horizontal passage, about 300 feet long and 50 feet deep. It is largely free of sediments due to the high velocity flows regularly experienced there. However, the upstream section nearest the swallet does contain significant amounts of visible bacteria (Butt and Murphy 2003). A number of cave diving researchers, including Amy Gionnotti of the Cambrian Foundation, are currently investigating this phenomenon (Amy Gionnotti, pers. comm.). Periodically, organic debris (tree limbs and leaves) and manmade trash appear in the Swallet Tunnel, a result of upstream displacement during heavy rainfall episodes.

The Rose Creek cave system is rich in detritus, and organic silt covers the cave floor nearly everywhere. The abundant supply of organics appears to support a robust troglobite fauna. Voucher specimens of pallid cave crayfish (*Procambarus pallidus*) have been collected from this cave and are contained in the collection of the U.S. National Museum. In September 2002, divers observed a single spider cave crayfish (*Troglocambarus maclanei*) at a depth of 140 feet near the mouth of the downstream feeder to this cave. This represents a significant range extension for the species. Divers have also reported a number of isopods and amphipods from this site (Franz 1994; Kelly Jessop, National Speleological Society Cave Diving Section, pers. comm.). Notably, water quality conditions in the Rose Creek cave system can vary significantly and temporally. The variations may be directly

dependent on weather-driven fluctuations in the intermittent creek that feeds the cave (Morris 2003). Not surprisingly, cave divers have documented small scale, abbreviated die-offs of troglobites following significant storm events (Morris 2003; Kelly Jessop, pers. comm.). Cave divers began conducting quarterly surveys for troglobites in the Rose Creek system in 2008.

In 2006, the DRP coordinated with the Florida Department of Transportation to obtain an easement to install a retention pond upslope of Rose Sink to improve the water quality of local runoff entering the Ichetucknee Trace cave system via the sink. In addition, and subsequent to this action, volunteers from the Ichetucknee Springs Basin Working Group installed a fence/grate across Rose Creek upstream of the swallet to catch debris before it enters the cave system. Several clean-ups involving volunteer cave divers have also occurred in the Rose Creek system (Jerry Murphy, pers. comm.).

McCormick Sink is the primary hydrogeological feature of interest on the McCormick parcel, a 156-acre partially forested tract immediately south of County Road 240 and the Rose Sink parcel. Besides McCormick Sink (also known as Church Bell Sink or Rose Creek Swallet Overflow Cave), there are three unnamed surface depressions on the property (J. Murphy, pers. comm.). Of the four features, only two usually hold water to any extent. The northernmost sinkhole on the tract (Sinkhole #1) only has exposed limestone at its bottom (J. Murphy, pers. comm.). The easternmost sinkhole (Sinkhole #2) has somewhat of a cavernous limestone outcropping at its surface and it periodically holds water. Sinkhole #3 is a slumped depression southwest of Sinkhole #2 that has no limestone outcrops. McCormick Sink, the westernmost sinkhole, is a karst window and is the only actively researched sink on the property. McCormick Sink is located along the Ichetucknee Trace about 3,000 feet south of Rose Sink. It is a former swallet of Rose Creek, but it now receives creek flow only during extreme flood events when Rose Creek spills over County Road 240. The entrance to the cave is small and silted. The cave passage extends laterally approximately 1,000 feet before stepping down to a maximum depth of 145 feet. In March 2009, divers excitedly confirmed for the first time the connection between the main water source of McCormick and the "Downstream Section" of the Rose Sink cave system (Murphy 2009). The McCormick cave system has a relatively stronger flow than the Rose system, causing McCormick to have more of a sand floor rather than silt/clay. During the 2003 troglobite survey, cave divers found no evidence of a die-off in this cave system, suggesting that McCormick may have some groundwater sources other than Rose Creek (Morris 2003). Nonetheless, cave fauna in this system resembles that of Rose Sink Cave.

Saylor Sink is the primary hydrologic feature on the Saylor parcel, an 80-acre forested tract located west of County Road 47 and about one mile southwest of the Kirby Limerock Mine. Other names for Saylor Sink include Boy Scout Sink and Troop Sink. Both the Kirby Mine and Saylor Sink are located within the southern part of the Ichetucknee Trace. This area of the Trace is very distinct, with a well-defined and ravine-like topography, which is especially apparent in the western portion of the Saylor Sink parcel.

Other than a few cave diving reports, very little information is available for Saylor Sink (Morris 2003). Some cave experts suggest that Saylor may be a collapse sink, while others say it may have once functioned as a midway swallet along the Trace. The entrance to Saylor Sink is a small solution chimney about 15 feet in diameter. Water depth in the sink is about 20 feet, but it fluctuates depending on the amount of regional rainfall. The cave is very short, no more than 100 feet long, and has a maximum depth of 30 feet. Divers entering the cave in March 2004 found abiotic conditions and a water temperature of 60 degrees F, which is atypically cold for groundwater (J. Murphy, pers. comm.). Other researchers have found similar conditions in the sink, suggesting that there may be little in the way of groundwater exchange between the cave and the surrounding area (Morris 2003). There is a small conduit in the back of the cave, but in general, divers have observed that water in the cave is green, tannic, and has no significant flow other than the small amount of "blue water" that enters from the ceiling. Some have also suggested that a naturally occurring "sediment plug" may have caused an impermeable layer of organic silt to block water exchange between the surface and the aquifer, which typically occurs in cycles within intermittent sinking stream systems (W. Skiles, pers. comm.). If that is so, it may indicate that Saylor Sink is directly connected to underground conduit systems and is thereby linked to springs along the Ichetucknee River (Butt and Murphy, 2003).

In 2003, researchers documented an Alachua light-fleeing cave crayfish (*Procambarus lucifugus*) in the Saylor Sink cave system, which represents a large range extension to the north for this species and the first record for Columbia County (Morris 2003). The Santa Fe cave crayfish (*Procambarus erythrops*) is also known from this location (FWC 2013).

Ichetucknee Springs Group

Water from the many streams, swallets, and sinkhole lakes located along the Ichetucknee Trace, and from the associated underground conduit system within the Upper Floridan aquifer, resurfaces just northwest of Fort White to form the Ichetucknee Springs Group. This "springs group" lies wholly within the boundaries of Ichetucknee Springs State Park, and provides the base flow for the Ichetucknee River (Scott et al., 2004). The park contains a 3.5-mile long stretch of the Ichetucknee River, a bit more than half the total length. Biologists have divided the park's portion of the river into three distinct regions: Headspring Reach, Rice Marsh Reach, and Floodplain Reach (Dutoit 1979). Immediately downstream from the park, the character of the river changes again, with the most significant difference being the addition of numerous shallow-water limestone shoals.

The Ichetucknee Springs Group contains 10 named and numerous unnamed springs and seepages (Hornsby and Ceryak 1998; Scott et al., 2004; Butt and Murphy 2003; Butt 2005). Starting at the head of the river and proceeding downstream, the named springs include: Ichetucknee Headspring, Cedar Headspring, Blue Hole Spring, Mission Springs Complex (total of eight known springs including Roaring, Singing, and Fig Springs), Devil's Eye Spring, Grassy Hole Spring, Mill Pond Spring, and Coffee Spring.

Ichetucknee Headspring forms a 75-foot by 105-foot wide pool. This second magnitude spring is the first major source of the Ichetucknee River. Prior to establishment of the state park, this spring had received very little protection from erosion and overuse. The result was that, over the years, severe sediment deposition had slowly decreased the pool's depth to 14 feet at the main vent. Historically the spring had been substantially deeper. A restoration project, started in 1994, has since increased the depth of the main vent to about 30 feet. Materials removed from the spring have included 46 cubic yards of concrete, some rubble, scrap metal, 266 gallons of trash, and 3,000 gallons of soil sediments. A small seep discharges to the spring from the west edge of the main pool.

Cedar Head Spring, also called Alligator Hole, is a more isolated spring located approximately 1,000 feet southeast of the Ichetucknee Headspring. It forms a pool measuring 30 feet by 60 feet in size. This second magnitude spring discharges to a 1,100-foot run that flows south toward Blue Hole Spring. Access to Cedar Head Spring is limited to authorized researchers.

Blue Hole Spring, also known as Blue Jug, discharges to a short run which joins the east side of the main stream about 1,800 feet below Ichetucknee Headspring. This spring is one of only two first magnitude springs among the ten named springs that feed the Ichetucknee River. Blue Hole Spring forms a pool about 85 feet by 125 feet in size. About seven feet below the surface of the pool is a powerfully flowing spring vent. The cavern associated with the vent is 40 feet deep and extends horizontally into a complex cave system. The park has traditionally allowed only divers who possess cave certification to access Blue Hole, but cavern divers may also access the main chamber. This is the only spring in the park where recreational cave diving is allowed. Divers call it "The Jug" because of its unique shape. Water that flows out of Blue Hole passes through the narrow neck of the jug. Cave divers have been conducting quarterly troglobite surveys in the Blue Hole cave system since 2004.

Mission Springs Complex is composed of eight separate springs, three of which contribute the majority of the discharge for this group: Roaring, Singing, and Fig Springs. This spring complex is located on the east side of the Ichetucknee River about 1,500 feet south of Blue Hole Spring. The combined discharges of this spring complex make it a first magnitude spring group that produces the second largest outflow along the river. Roaring Spring, which discharges from the north side of Fig Island, is the largest of the complex. Singing Spring is located on the south side of Fig Island. Additional smaller springs and seeps flow from the base of an exposed limestone formation along the east shoreline about 250 feet from the river, where the topography rises dramatically. Another significant spring in this group discharges from the bottom of the river channel south of Singing Spring. Discharge from the three major springs in this complex has created two separate spring runs that flow on opposite sides of Fig Island. The Mission Springs Complex is the second major spring on the river (see below) where native submerged aquatic vegetation (also referred to as submerged macrophytes) has experienced significant die-off stress since 2002. According to staff at Ichetucknee Springs State Park, large areas of submerged macrophytes at the Mission Complex had suffered significant die-offs

by 2005, similar to the Devil's Eye scenario (Sam Cole, pers. comm.). The cause of the die-offs is unknown, but experts suspect increased levels of macro algae (also referred to as periphyton) in the springs, and water quality issues within the springshed (FDEP 2006; Hand 2006; Stevenson et al. 2007).

Devil's Eye Spring, also called Boiling Spring, is located about 850 feet south of the Mission Springs Group. This second magnitude spring is comprised of two large vents that discharge within a 60 by 120-foot pool with a short 30 foot run that empties into the main channel of the river. Smaller secondary vents occur in the slough on the north side of the spring pool. This is the first spring on the river to have experienced a major die-off of native submerged macrophytes, beginning in 2000. As recently as 1997, research had indicated that 80% of the Devil's Eye spring-run bottom had characteristically high plant diversity with no visible signs of stress. In 2016 by comparison, 15 years after the initial indications of severe vegetation die-off, the percentage of damaged or dead submerged macrophytes at Devil's Eye remains significantly high. At the worst stage of the die-off, submerged macrophytes in the entire Devil's Eye complex were completely absent (100% die-off), including the slough area to the north of the boil (Sam Cole, pers. comm.). Vegetation along the west shoreline of the river for a distance of about 100 feet below the mouth of the Devil's Eye spring run also suffered severe losses. There have been periods of recovery during the past fifteen years, but as of 2016 most of the recovery is restricted to the lower part of the spring run and the adjacent river. The exact cause of the die-off is still unknown, but recent research has pointed specifically to water quality issues in the Ichetucknee groundwater basin, increased periphyton levels in the springs (i.e., decreased light transmittance to plants), and potentially long-term groundwater flow reductions (FDEP 2006; Hand 2006; Grubbs and Crandall 2007; Heffernan et al. 2010).

Grassy Hole Spring is a series of several small shallow vents that discharge into a 200-foot spring run, which flows into the east side of the Ichetucknee River about 1350 feet downstream from Devil's Eye Spring. Collectively, the vents at this spring produce a second magnitude discharge.

Mill Pond, a second magnitude spring, is located about 800 feet downstream from Grassy Hole on the east side of the river. It vents into a 50 by 100-foot shallow pool at the head of a 500-foot spring run that empties into the mainstream. An historic gristmill once existed at the site, harnessing power generated by the spring boil; hence the name given to the spring.

Coffee Spring is the last named spring to discharge into the Ichetucknee River. This third magnitude spring is located about one mile downstream from Mill Pond Spring, but on the west side of the river. This is the only spring in the Ichetucknee watershed where the critically imperiled and endemic Ichetucknee siltsnail (*Floridobia mica*) occurs. According to Fred Thompson, former Invertebrates Curator at the Florida Museum of Natural History, there is evidence of a population decline in this species based on early surveys from 1989 to early 2002 (District 2 files; Fred Thompson, pers. comm.). FWC biologists conducted the first quantitative population assessment in November 2015 (Warren and Bernatis 2015). The siltsnail

was moderately abundant but had an extremely clumped distribution within the spring run. A reported collection of another rare gastropod, *Elimia albanyensis*, from Coffee Springs in 2000 has not been verified adequately and needs further investigation (Florida Natural Areas Inventory element occurrence records). Groundwater discharge at this spring emerges from the base of an elaborate rock outcropping about 30 to 50 feet from the mainstream. In order to protect the sensitive nature of this seepage community, park staff installed a fence along the mainstream in 1989 that prevents human access to the spring from the river. Coffee Spring is the only named spring in the Ichetucknee River that past dye trace studies have failed to define its groundwater source within the springshed.

Additional unknown or unnamed springs and seepages that occur along the riverbank and on the bottom of the Ichetucknee River can contribute up to 19 percent of the total river flow.

Ichetucknee Springshed Hydrology

One watershed level process that seldom receives adequate consideration during studies of river hydrology is flooding. Especially important is the relationship between downstream flooding in a major river and upstream back flooding in its tributaries (Pringle 1997; Diehl 2000; Garza and Mirti 2003). In the case of the Ichetucknee River, back flooding occurs periodically when hydrologic conditions in the Santa Fe River downstream from the Ichetucknee cause a reduction in outflow from the Ichetucknee into the Santa Fe. The back flooding can occur under at least two different scenarios: 1) when the flow of the Santa Fe generated within its own watershed is high enough for it to reach flood stage; 2) when the Suwannee River is at flood stage, causing its Santa Fe tributary to back flood. Under both circumstances, a specific resistance of the Santa Fe to flow entering from the Ichetucknee occurs at the confluence of the two rivers. The full flow of the Ichetucknee is unable to penetrate the Santa Fe, and back flooding of the Ichetucknee river results.

In the Ichetucknee watershed, at least three natural communities significantly benefit from this phenomenon of ephemeral back flooding: alluvial forest, floodplain marsh and floodplain swamp. These floodplain communities are highly dependent on the ephemeral nature of this flooding regime. If the back flooding did not occur periodically, major changes in the soils and the species compositions of these communities would ensue. Alteration of the back-flooding regime on the Ichetucknee River, especially in conjunction with reductions in base flow of springs along the river, could cause significant changes in the character of these wetland communities (Light et al. 2002; Sepulveda 2002).

Another very prominent ecosystem process occurring in the Ichetucknee springshed is the movement of contaminants and nutrients through surface and ground waters within the basin (Katz and Hornsby 1998; Heffernan et al. 2010). The Ichetucknee springshed is a sub-basin of the Santa Fe River, which ultimately flows into the Suwannee River. The entire Suwannee River watershed drains approximately 10,000 square miles in Florida and Georgia. The Suwannee has an average flow of

7,100 million gallons per day (mgd) that ultimately discharges into the Gulf of Mexico. Hydrologists have been measuring total nutrient loads dumped into the Gulf of Mexico via the Suwannee River for the past 50 years (Berndt et al. 1998; Hand et al. 1996; Kenner et al. 1991; Ham and Hatzell 1996; Pittman et al. 1997). Nitrogen and phosphorus are the two most common nutrient pollutants that regulate macro algae growth in marine and freshwater ecosystems (Stevenson et al. 2007). Excessive nitrogen, specifically in its nitrate form (NO3), is partially responsible for the creation of unhealthy, polluted aquatic ecosystems worldwide (Quinlan 2003; Upchurch et al. 2007).

As illustrated in Table 2, the Santa Fe River watershed contributes a significant proportion of the yearly nitrate-nitrogen (NO3) input to the Suwannee system.

Table 2. Total % contribution per year (NO_3)

Suwannee River Sections and Tributaries

	Upper	**Middle**	**Lower**	**Alapaha**	**Withlacoochee**	**SantaFe**	**Ichetucknee**
Area (mi^2)	**2873**	**824**	**686**	**1801**	**2382**	**1184**	**200**
%Coverage	**28.80%**	**8.30%**	**6.90%**	**18.10%**	**23.90%**	**11.90%**	**2.01%**
Year							
1998	18.1	46.0	2.4	3.0	13.1	16.8	1.9*
1999	10.8	47.0	5.2	4.0	11.9	21.2	1.9*
2000	14.0	36.0	3.0	6.0	11.0	22.6	7.4
2001	2.8	45.5	2.8	12.8	20.2	23.0	4.3
2002	7.2	29.3	31.4	3.6	8.9	19.7	2.5
2003	0.8	34.4	14.4	12.2	23.8	16.2	1.9
2004	3.6	34.7	19.2	9.7	18.6	21.5	2.4
2005	13.5	28.9	16.1	2.4	19.4	19.6	2.5
Mean total	8.9	37.7	20.3	6.7	15.9	20.1	3.5

* low estimate

In fact, the Santa Fe watershed rivals two other upstream Suwannee River sections in terms of total yearly input of nitrogen into the Suwannee system (District 2 DRP files). The middle section is located in the central region of the Suwannee River, with over 95% of its area situated in Suwannee and Lafayette Counties (Mirti et al. 2006). This section is also an area of significant karst topography, and similar to the Ichetucknee, is predominantly groundwater influenced during times of low flows. The Ichetucknee basin's average contribution of NO_3 to the Suwannee appears to be about 3.5% of the total.

Nutrient loading from the Suwannee into the Gulf of Mexico over an eight-year period from 1998 to 2005 totaled nearly 40 thousand tons of nitrogen (N) and 11 thousand tons of phosphorus (P) (Table 3).

The Ichetucknee basin contributed just less than 3% of the total N (also 3% of the total P) dumped into the Gulf of Mexico via the Suwannee watershed every year

(SRWMD 1998-2006 data; Hornsby and Ceryak 1998). In the majority of Florida's springs, including the Ichetucknee, increased nitrogen and phosphorus levels are now recognized as a significant driving force behind large-scale benthic macro algae blooms (Stevenson et al. 2007; Heffernan et al. 2010). Periphyton growth in many Florida springs is now so rampant that submerged macrophytes are being smothered, and in fact, large-scale macrophyte die-offs have occurred (District 2 Files; Wetland Solutions Inc. 2010).

Table 3. Total Nutrient Loading into Gulf of Mexico (tons/year)

	Suwannee Basin		Santa Fe		Ichetucknee	
	N	**P**	**N**	**P**	**N**	**P**
1998	7113*	1955*	1196	240	85*	60*
1999	4745*	693*	1004	109	85*	60*
2000	2676	493	593	47	193	18
2001	3067	909	689	68	128	14
2002	3012	829	584	68	73	11
2003	4591	1910	726	241	85	60
2004	5507	1309	1143	188	129	36
2005	7040	2939	1358	369	172	59
Total	37751	11037	7293	1330	950	318

* low estimate

One significant outcome of the nutrient loading research conducted in recent years is that numerous government agencies and researchers have finally begun to recognize the need for a greater understanding of water budgets and nutrient cycles as they apply to smaller, but equally important watersheds such as the Ichetucknee. During the period from 1990-2016, the Division of Recreation and Parks issued over 110 different permits for research/monitoring projects targeting water resources within the Ichetucknee Basin (District 2 files). The diverse projects have included exploration of aquatic caves, investigation of aboveground and belowground hydrogeologic connections, evaluation of surface and groundwater quality and quantity, assessment of economic impacts, evaluation of recreational carrying capacity numbers, and assessment of ecosystem health, to name a few. Application of the broad spectrum of knowledge gained from these endeavors will be integral to a successful separating out of natural from anthropogenic sources when assessing impacts to natural communities within this springshed system.

Water Monitoring

Concerns about the future water quality of the Ichetucknee River led to the formation of the Ichetucknee Springs Basin Working Group (IWG) in 1995. The FDEP funding for this and several other springshed stakeholder groups ended in 2011. As of 2016, the Santa Fe River Springs Basin Working Group was the only remaining springs stakeholder group in Florida and is led by Alachua County Environmental Protection Department (ACEPD 2016).

The IWG was composed of numerous stakeholders including federal, state, regional, and local agencies that have responsibilities in, or knowledge about, the Ichetucknee basin. Other regular members of this group included local citizens, private landowners, educators, businesses, and conservation organizations. The IWG gathered information about the Ichetucknee system using past studies, new research, and interviews to help to recognize and define water quality and quantity threats. The success of this north-central Florida group and of the Wakulla Springs Working Group in north Florida led to their use as models for the establishment of several other working groups in the region.

The IWG played an integral role in coordinating work such as dye trace studies that provided direct evidence of connections between surface and groundwater features in the Ichetucknee Trace and springs along the Ichetucknee River (Skiles et al. 1991; Hirth 1995). A well-deserved credit goes to the IWG for significant accomplishments during its existence. The group played a very active role in the education of local communities by bringing people together to cooperatively find solutions to water issues as they cropped up. The town of Lake City's efforts to improve Alligator Lake serves as a good example of the type of success attributable to the group's endeavors (Kays 2005).

State and federal agencies have sporadically collected water quality and water level data for surface water and groundwater resources in the Ichetucknee River basin since 1917 (Rosenau et al. 1977; Strong 2004). From 1917 to the 1980s, the U.S. Geological Survey (USGS) was responsible for collecting river stage data at the Highway 27 bridge over the Ichetucknee River. Until the 1990s, hydrological data collection was infrequent and rarely published. In 1989, the Suwannee River Water Management District (SRWMD), with USGS assistance, began to better organize and coordinate specific data collection activities. In the 1990s, the FDEP embarked on a period of much greater involvement in surface and groundwater assessment by initially accumulating and analyzing all available datasets associated with required water quality assessments in Florida (Hand et al. 1990; FGS 1991).

Over the past 20 years, in its capacity as a lead agency for water resources, the SRWMD has increased its involvement in coordinating assessments of water quality and quantity and in supporting springs protection research. It has also implemented an ambitious monitoring network for numerous waterbodies within the district (McKinney et al. 2008). This network consists of stations at numerous rivers, lakes, and springs, as well as at surface and groundwater wells. The sampling protocol includes measurement of water levels, discharge or flow rates, and rainfall amounts, as well as several parameters that assess water quality. The SRWMD is also conducting trend analyses of current water quantity and quality conditions that are used in addressing future water supply needs (Suwannee River Hydrologic Observatory 1997; Upchurch et al. 2007). The data collected by the SRWMD primarily guides its decision-making process in issuing consumptive use permits and approving water supply projects, in watershed planning, and in managing district projects. It also aids SRWMD in the development of state-mandated minimum flows and levels (MFLs) for water bodies throughout the district.

In 1996, with expanded efforts in 2000, FDEP initiated its own statewide water-monitoring program (FDEP 1996, FDEP 2001, FDEP 2005). Referred to as the Integrated Water Resource Monitoring Program, it has evolved from the initial efforts to become a mandate for implementing the requirements of the 1999 Florida Watershed Restoration Act and Section 303(d) of the Federal Clean Water Act (Copeland et al. 1999; Maddox et al. 1992; FDEP 2005). This program now offers a much broader, more comprehensive way of monitoring Florida's water resources, one that is based on natural hydrologic units and a holistic watershed approach. Accordingly, 52 hydrologic basins have been delineated in Florida, with a five-year rotating schedule that allows water resource issues to be addressed at different geographic scales (Livingston 2003). This watershed approach also provides a framework for implementing the Total Maximum Daily Load (TMDL) requirements necessary for restoring and protecting water quality in specific watersheds (Hallas and Magley 2008). Implementation of a Basin Management Action Plan (BMAP) is FDEP's primary resource for addressing specific water issues and reducing the amount of water quality impacts through use of numeric nutrient criteria (FDEP 2007; Grubbs 2001). All priorities for TMDL development in Florida follow strict adherence to verified priority waterbody lists reviewed by the United States Environmental Protection Agency (USEPA 1995).

Important hydrological information collected, stored, and managed by these agencies can now be accessed through a variety of web-based databases (FGS 2007; USGS 2016; FDEP 2016a, FDEP 2016b). A comprehensive assessment of existing hydrological data within the Ichetucknee springshed was summarized in two works: Ichetucknee Work Plan (Wetland Solutions Inc. 2006) and Ichetucknee Springs Ecosystem Study (Wetland Solutions Inc. 2010). The latter work was a two-year, synoptic, ecosystem-level study of Florida springs. The extended appendix in this work includes a summary of all existing physical, chemical and biological data for the Ichetucknee system. In addition, this group issued a science-based environmental health report card based on six parameters including spring discharge, water clarity, nitrate concentration, submerged macrophytes, macroalgae cover, and visitor allergic reactions (Wetland Solutions Inc. 2008). The Ichetucknee received its lowest grades for persistent water quality issues associated with nitrate increases (the six-spring average in 2008 was 0.63 mg/L) and for macro algae impairment (58% average algae cover at Blue Hole, Mission and Devil's Eye Springs). In 2012, the Howard T. Odum Florida Springs Institute (FSI) developed a restoration plan for the Ichetucknee River and its spring ecosystems (FSI 2012a). The report uses best available science to provide a blueprint for ecosystem restoration of the Ichetucknee River and springs.

Water Quality, Quantity and Spring Protection Areas

The Ichetucknee River is a crown jewel of the Florida Park Service because of its relatively pristine nature and its classification as one of the 15 largest spring groups in the state (Stevenson and Rupert 2000; Scott et al. 2004). Despite a recent decline, the Ichetucknee remains a unique, highly buffered, alkaline spring ecosystem that owes its clarity to a direct groundwater connection with the Upper Floridan aquifer, which is typical of many other spring-fed streams in Florida (Whitford 1956; Bass and Cox 1985, Canfield and Hoyer 1988). Unfortunately, over

the past twenty years, the health of this spring ecosystem has progressively deteriorated and it has begun to show signs of lasting impairment (Stevenson et al. 2007; Hallas and Magley 2008). This impairment is not unique to the Ichetucknee, however. Within the nearby Middle Suwannee River, nutrient concentrations, particularly of nitrates, have steadily increased over the past 50 years (Ham and Hatzell 1996). Similarly, nitrates have increased in other springs across the state over the past 30 years (Hornsby and Ceryak 1998; Means et al. 2003). The Middle Suwannee basin is similar to the Ichetucknee in that it lacks any major inputs from tributaries. Therefore, most contaminants in the water are attributable to groundwater discharged at the springs (Katz and Hornsby 1998). Both the Middle Suwannee and the Ichetucknee rivers contain nutrient loads that are relatively high for springs because of long-term groundwater nutrient contamination (Katz et al. 1999). Data indicates that specific land-use activities outside the park boundary are playing a significant role in the declining health of this spring ecosystem (Odum 1957a; Cohen et al. 2007).

Two significant anthropogenic factors that may have contributed to a decline in spring ecosystem health are increases in groundwater nutrient pollution and reductions in groundwater flow due to human withdrawals (Wetland Solutions Inc. 2010). Until the year 2000, these two factors seemed to be of relatively low extent in the Ichetucknee springshed and they did not appear to pose a discernable threat to the Ichetucknee ecosystem. Subsequent to the year 2000, research has demonstrated that a complex relationship exists between increased groundwater nutrient levels and increased presence and abundance of periphyton within specific springs along the Ichetucknee (Stevenson et al. 2007). These macro algae increases have played a significant role in the declining health of the Ichetucknee River, as evidenced by two ongoing, persistent large-scale die-offs of submerged aquatic vegetation (Sam Cole, pers. comm.; WSI 2008).

Before 2000, the main impact to the Ichetucknee occurred each summer as recreational users such as swimmers and tubers inadvertently uprooted or trampled significant amounts of submerged macrophytes along the shallower parts of the river. In 2003, research documented that aquatic plant beds covered 78% of the Ichetucknee River bottom. Remapping in 2004 revealed that this coverage had decreased by 2%. Additional user impacts to the Ichetucknee spring ecosystem are also now apparent. Long-term plant transect data collected by park staff, and supporting photo-documentation, have shown that degradation becomes more severely pronounced during times of drought, especially when water levels in the upper reaches of the river are at their lowest (Sam Cole, unpublished, pers. comm.; District 2 files; Kurtz et al. 2004; FSI 2012a). The most significant vegetation damage occurs primarily within the Ichetucknee Headspring and Rice Marsh reaches (Dutoit 1979; District 2 files; Kurtz et al. 2004). Recreational use is also likely the predominant cause of increased turbidity in the river, which is especially noticeable on busy summer weekends (WSI 2011) (Faraji 2017). Visitor activity in shallow water tends to disturb silt beds, which causes fine silt particles to suspend in the river current and flow downstream. These particles eventually settle and may cover submerged plant beds. These impacts occur primarily in the shallow sections of the river between the Headspring and the Midpoint Launch (FSI 2012a).

In summary, research indicates that several factors contribute to the declining health of the Ichetucknee ecosystem: higher nutrient levels, reductions in groundwater flow, and visitor carrying capacities that may be too high for shallower reaches of the river. While certain impacts are attributable to recreational activities within the park, most originate outside the park within the roughly 576,000-acre Ichetucknee springshed. Park management must continue to monitor hydrological resources closely and remain an active stakeholder in shaping growth management within the Ichetucknee springshed. Management will need to reassess the extent and type of recreational use allowed in the more ecologically sensitive parts of the river as recommended in the Ichetucknee Springs Restoration Plan (FSI 2012a).

Water Quality

In 1996, FDEP initiated a baseline monitoring project within the Ichetucknee springshed, beginning a long-term investigation into surface water quality and sources of waterbody contamination. Initial efforts focused on surface waters and included quantification of levels of nutrients, minerals, and coliform bacteria, as well as macroinvertebrate diversity. Additional work included analyses of water columns, sediments and biota for the presence of heavy metals, pesticides, herbicides, and other organic pollutants. Results of those studies indicated that the condition of the aquatic environments in the park was "remarkably good" during this period, with the exception of some increased nutrient levels near individual springs (FDEP 1996; FDEP 1997). Similarly, when macroinvertebrate communities in the Ichetucknee were compared with those found in other undisturbed streams fed by the Floridan aquifer, indications were that the river had relatively healthy conditions up to the year 1997 (FDEP 1997). Data also suggested that human activities within the springshed did not appear to be causing negative impacts to benthic macroinvertebrate communities during that period.

Quarterly water quality monitoring in 18 important springs in Florida began in 2000 (FDEP 2008c). Reports from this work, referred to as Ecosummary, contain quarterly ecosystem health assessments of the Ichetucknee River. An overall summary of seven years of work on the Ichetucknee indicates several notable trends that may help explain the declining health of the system, despite some assessments that are more positive. For example, Stream Condition Indices have continued to rank the Ichetucknee as one the healthiest of the 18 monitored springs in terms of benthic macroinvertebrate diversity. The river also has the best overall habitat assessment of the 18 springs examined. However, the average concentration of total phosphorus found in the system was quite high (ranging from 0.028 to 0.810 mg/L), and the Ichetucknee is ranked as one of the worst in this category. Other researchers have cited this same trend of increased phosphorus levels in the Ichetucknee, even suggesting that it is a 'limiting factor' for periphyton abundance in the springs (Kurtz et al. 2003; Stevenson et al. 2007). In a related Ichetucknee study, periphyton abundance was significantly higher than that considered normal under EPA guidance rules (FDEP 2006). The EPA has suggested that water bodies with periphyton levels exceeding 150 mg/m^2 may be impaired. According to the Ichetucknee study, periphyton levels just below Mission Spring have reached 537 mg/m^2, well in excess of EPA guidelines. During the period

between the 1996 baseline study and the 2005 follow-up work, according to Rule 62-302.500 (48) (b) FAC, a severe imbalance of aquatic macrophytes occurred in surface waters near Mission Spring. The FDEP basin status report for this region indicates that the Ichetucknee River became a potentially impaired waterbody in 2001 because of unbalanced abiotic levels, including dissolved oxygen (FDEP 2001). A total maximum daily load assessment of the Ichetucknee river and its priority springs was completed in 2008 (Hallas and Magley 2008). Currently, the Ichetucknee is a verified impaired water body listed for nutrients and dissolved oxygen, meaning that its surface waters do not meet applicable state water quality standards for the two parameters. In 2012, FDEP developed a Basin Management Action Plan (BMAP) for the entire Santa Fe Basin, including the Ichetucknee (FDEP 2012). In 2016, FDEP implemented stronger legislative protections to the Ichetucknee Springs Group by mandating it as one of 30 Outstanding Florida Springs (Florida Springs and Aquifer Protection Act (Part VIII of Chapter 373, F.S.). This legislation required additional protections specifically designed to assist efforts with the BMAP process including water quality restoration. Integral to this BMAP process is the designation of important springshed protection zones called Primary Focus Areas (PFA). The intent of PFA's are to institute the highest protection level to these 30 important freshwater spring ecosystems within their most vulnerable springshed areas (Scott et al. 2014; Upchurch and Champion 2004).

There is widespread recognition that nuisance periphyton is increasing in abundance in most Florida springs, which is a recognized symptom of declining spring health (Mirti et al. 2006; Stevenson et al. 2007). In the mid-1900s, a diverse assemblage of macroalgae naturally comprised at least 50% of the aquatic plant growth within the Ichetucknee River and it spring ecosystems (Whitford 1956). In other words, a healthy Ichetucknee ecosystem should include a biologically diverse assemblage of algae and microscopic diatoms, as well as a rich diversity of submerged aquatic vegetation. However, along the Ichetucknee River, the surge in nuisance periphyton abundance is most predominant in the upper reaches near spring boils and along short stretches of spring runs associated with those boils, e.g. Devil's Eye. *Lyngbya* and *Vaucheria* appear to be the two most common types of nuisance algae observed (Kurtz et al. 2004; Stevenson et al. 2007). Some periphyton species, such as *Vaucheria* spp., show significant responses to increased levels of phosphorus and nitrogen in the system. These two nutrients apparently play a substantial role in regulating periphyton growth rates. In the past, several groups had been involved in quantifying periphyton abundance in the Ichetucknee (Canfield and Hoyer 1988; Kurtz et al. 2003, Kurtz et al. 2004, Steigerwalt 2005; Stevenson et al. 2007, FDEP 2006, Wetland Solutions Inc. 2010). These groups used at least three different protocols to collect data and monitor changes in periphyton levels. Currently, however, FDEP Bureau of Laboratories is the only group conducting periphyton assessments in the Ichetucknee (FDEP 2008d). Their most recent guidance recommends use of the Rapid Periphyton Assessment Method for monitoring long-term changes within affected water bodies.

Because of the unconfined nature of the aquifer in the Ichetucknee basin, non-point nutrient sources including leached fertilizers, storm water runoff, and malfunctioning septic tanks are causing levels of these specific nutrients in the

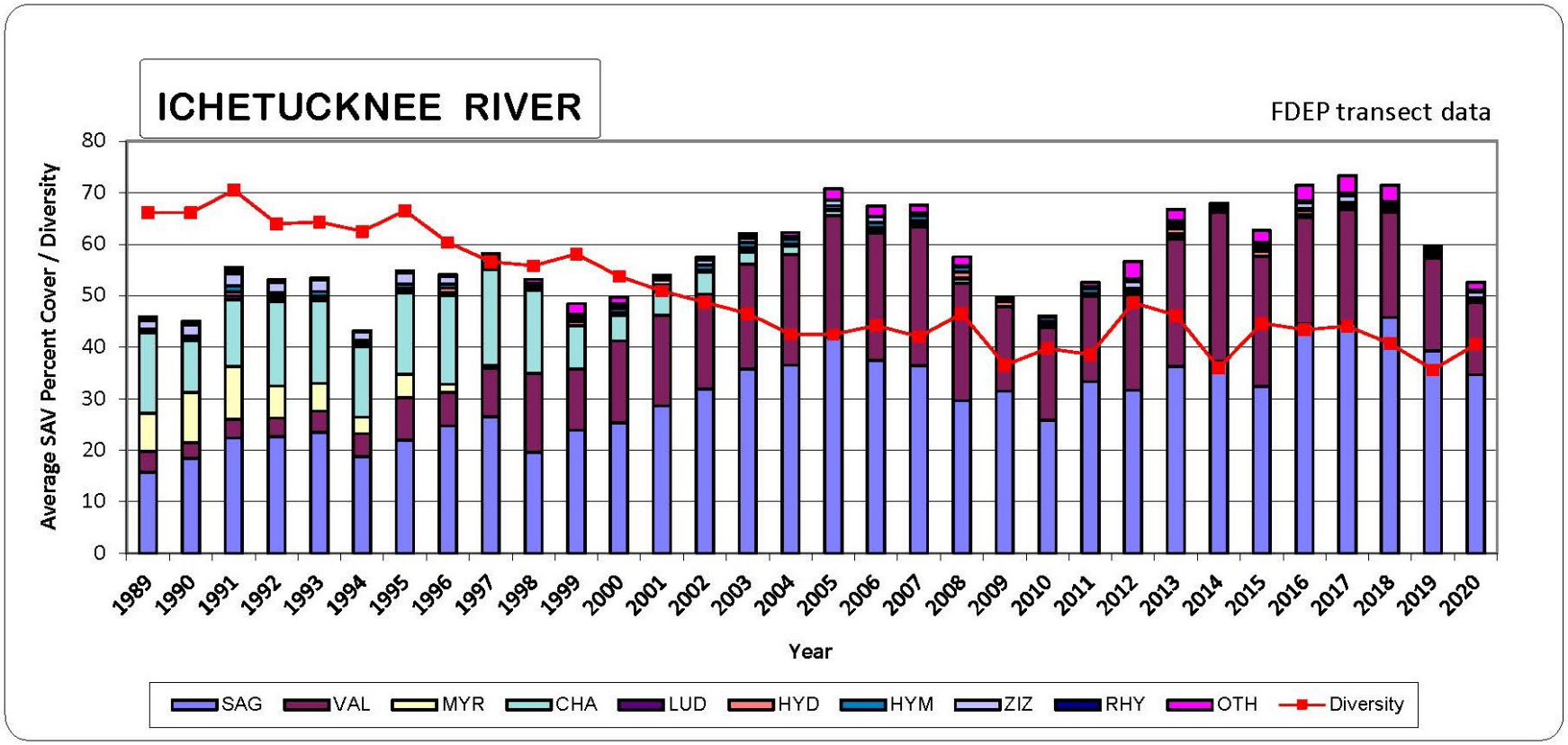
Ichetucknee springshed to become artificially elevated (Upchurch et al. 2007; Cohen et al. 2007). Research has indicated that the nitrates found at Blue Hole Spring are inorganic in origin, which indicates that the recharge area for Blue Hole must contain an abundance of fertilized agricultural fields and yards (Cohen et al. 2007). Average nitrate-nitrogen levels recorded in the Ichetucknee springs range from 0.34 mg/L at Mill Pond to 0.87 mg/L at Cedar Head (Wetland Solutions Inc. 2006; WSI 2010). Determining nutrient level trends in this system seems to depend on the area of the river being sampled (FDEP 2008c). For springs along the upper part of the Ichetucknee, an upward trend in nitrate levels is evident, but for the lower half of the river, the apparent trend is toward decreased levels (FDEP 2008c; Upchurch et al. 2007). Phosphorus, on the other hand, shows the opposite trend, with increased levels in the lower portions of the river. These trends correlate significantly with the increase in two native submerged macrophytes within the lower portions of the Ichetucknee: strap-leaf sagittaria (*Sagittaria kurziana*) and tapegrass (*Vallisneria americana*). With the lack of information concerning the groundwater origin of Coffee Spring, the threat of groundwater contamination to this vulnerable spring and the continued protection of the endemic Ichetucknee siltsnail is extremely problematic.

Research has sparsely addressed how the increase in contaminants in the Ichetucknee may have affected benthic macroinvertebrate communities (Woodruff 1993; Steigerwalt 2005; Dormsjo 2008; Politano 2008). It has been suggested that the presence of a diverse freshwater gastropod population in the river could be used as an indicator of good water quality, and therefore could function as a reliable indicator of ecosystem health (Thompson 2000). Surveys of the Ichetucknee siltsnail at Coffee Spring between 1989 and 2004 indicate that the population of this species, which is endemic to the site, had decreased dramatically from hundreds of thousands in early surveys to merely tens of thousands in 2004, a decline never before witnessed by the researcher (District 2 files; Fred Thompson, pers. comm.). A quantitative survey in 2015 (Warren and Bernatis 2015) found the snails to be moderately abundant with significant juvenile recruitment. However, they did point out that the siltsnail is potentially threatened by increasing groundwater nitrate levels.

In 1978 and 1979, researcher Charles DuToit developed detailed maps of submerged macrophyte populations in the Ichetucknee River (DuToit 1979). At his recommendation, photo points were then established at various locations along the river so staff could document subsequent changes in submerged plant beds. In 1989, park staff began to monitor submerged macrophytes quantitatively through semiannual surveys at multiple permanent transects established along various river reaches within the park. Even though this monitoring effort was originally designed to record changes in aquatic plant abundance relative to varying intensities of recreational use, it has also revealed that a significant shift in species diversity of submerged macrophytes occurred between 1989-2008 (WSI 2010). Figure 1 provides a summary of submerged aquatic vegetation cover and species diversity from 1989 to 2020 and is derived from the data collected on the park's monitoring transects. Interestingly, a comparison of the 1979 assessment of submerged macrophytes with that of a 2004 study suggests that over a 24-year period,

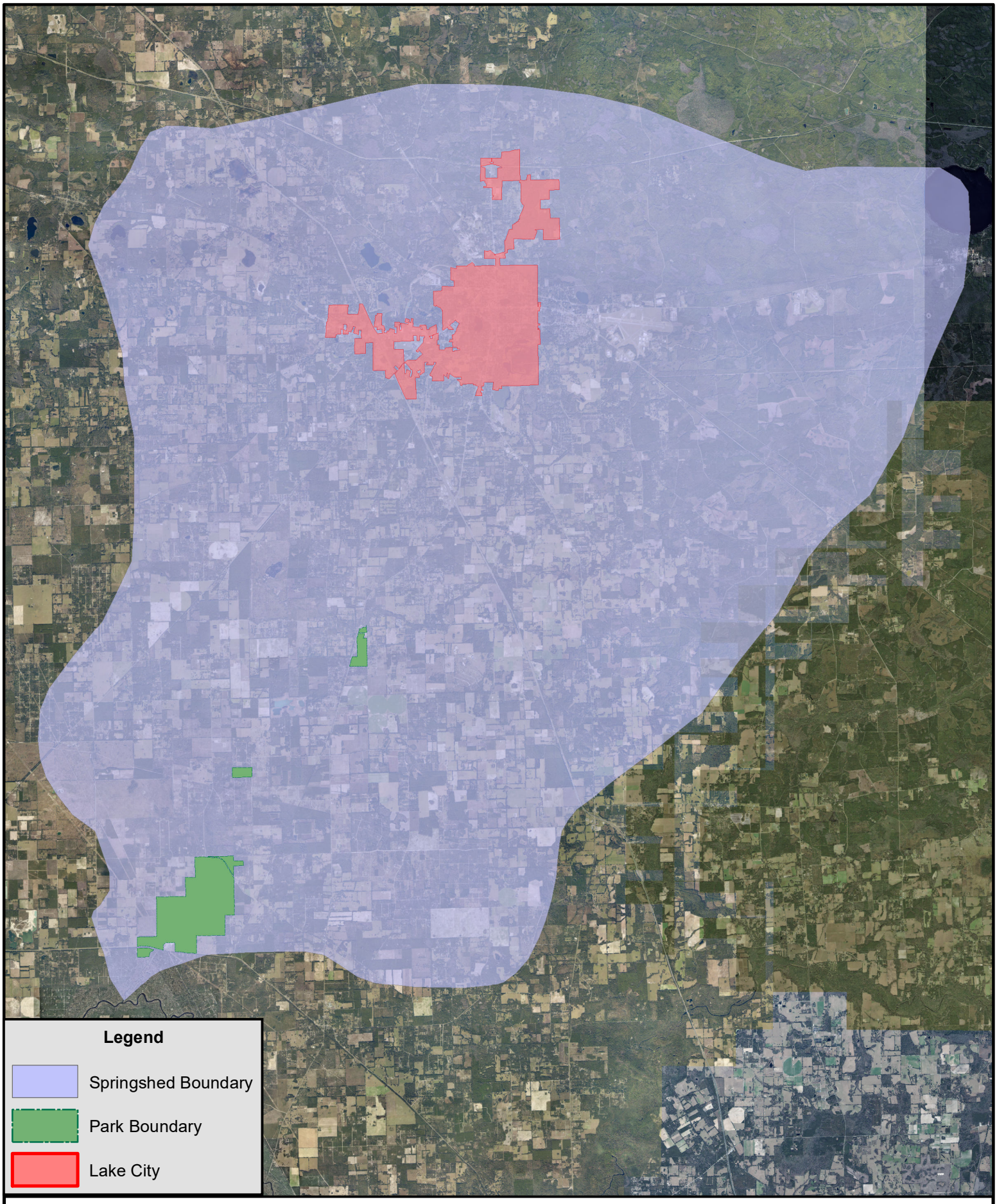
vegetation cover in the river has increased by over 350% (WSI 2010). This increase has been attributed to increased nutrient loads in the springs. To understand the long-term changes in submerged aquatic vegetation diversity within the Ichetucknee River, implementation of a regular monitoring program, similar to the Rainbow River, is recommended (ANAI and DCWI 2012).

In 2005, park staff discovered that the septic system for one of the park facilities had failed. The drain field for the system was located above conduits with direct connections to Mission, Devil's Eye, and Grassy Springs, such that the potential for contamination of those springs was considerable. The DRP quickly achieved funding for septic system upgrades, including an aerobic digester, which resolved the problem. Since 2000, upgrades to several other wastewater treatment facilities in the park have also taken place. The emphasis has been on relocating septic systems an adequate distance away from the springs and river and on improving system performance and efficiency. Even though park septic system issues have been addressed successfully, this illustrates the importance of a continued active involvement by concerned stakeholders in identifying water quality issues and finding solutions.



SAG = Sagittaria kurziana
VAL = Valisineria americana
MYR = Myriophyllum heterophyllum
CHA = Chara (prob.)zeylonica
LUD = Ludwigia repens
HYD = Hydrocotyle (prob.) verticillata
HYM = Hymenocallis rotata
ZIZ = Zizania aquatica
RHY = Rhynchospora sp. or Carex sp.
OTH = Lobelia cardinalis, Rorippa officinale, Cicuta maculata

Figure 1. Average submerged aquatic vegetation cover and diversity for Ichetucknee River.
Data from FDEP vegetation transects, analysis and graph courtesy of Howard T. Odum Florida Springs Institute.



ICHETUCKNEE SPRINGS
STATE PARK

N

0 0.75 1.5 3 Miles

Florida Department of Environmental Protection
Division of Recreation and Parks
Date of aerial; 2016

ICHETUCKNEE SPRINGS
SPRINGSHED BOUNDARY

Water Quantity

The average total discharge of the Ichetucknee River is approximately 348 cubic feet per second (cfs) (USGS 2016). Two primary sources of the river are the Ichetucknee Headspring (about 53 cfs) and Blue Hole Spring (152 cfs), with the balance of the remaining flow contributed by the six other major springs (Table 4). The minimum flow ever recorded for the entire river was 132 ft^3/sec (at the U.S. Highway 27 Bridge in 2003), while the maximum was 579 ft^3/sec on April 29, 1948. Flows which have greatly exceeded the 364 ft3/sec average (n=400) have been caused by back flooding from the Suwannee and Santa Fe Rivers. This aspect of back flooding may result in an underestimation of the total discharge of the river (WSI 2006). There is evidence suggesting that over the period of record at the U.S. Highway 27 Bridge, the Ichetucknee River discharge has declined approximately 0.8 cfs per year since 1935 (Grubbs et al. 2009). This reduction in flow constitutes a loss of nearly 60 cfs or roughly 15% of the river's historic discharge. There is some evidence that this reduction in historic flows is even as high as 25% (FSI 2012b). A complete summary of the long-term flow data for the Ichetucknee is available in a work plan that addresses impairment status in the Ichetucknee springshed (Wetland Solutions Inc. 2006). In addition, a recent springs ecosystem-level study summarizes all flow data for this system (WSI 2010; FSI 2012b).

Table 4. Ichetucknee Springs Discharge (cfs)

Location	Max(year)	Min(year)	A	B	C	D	E
Blue Hole	296 (2005)	62 (2003)	59*	106	137	107	122
Mission Group	169 (2005)	34 (2003)	91*	85	111	87	101
Headspring	80 (2006)	13 (2003)	42	42	41	34	51
Devil's Eye	70 (2005)	39 (2002)	40	60	55	47	50
Cedar Head	15 (2005)	2.8 (2002)	10	17	9	6	7
Mill Pond	58 (2005)	6.2 (2005)	20	23	35	25	30
Grassy Hole			3	10		7	
Coffee				3		3	
Other Flows*			61		13		
Springs Subtotal			**266**	**346**	**388**	**316**	**361**
Dampier's	613 (2005)	156 (2003)			401		336
Hwy27 Bridge	579 (1948)	132 (2003)	327	207	394	289	416

* Calculated

[A] Skiles et al 1991 [B] Hornsby/Ceryak 1998 [C] USGS 9/2003 [D] WSI 2006 [E] USGS 4/2008

An oddity of flow rates in the Ichetucknee system is that the sum of all the individually measured spring outputs is often substantially higher than the total river flow measured at the U.S. Highway 27 Bridge. This observation is based on a USGS analysis of real time data from Dampier's Landing to the U.S. Highway 27 Bridge (USGS 2016). Sam Upchurch, hydrologist with SDII Global Corporation, has speculated that an unknown river siphon (underwater geologic feature) may be responsible for this loss of water in the system (Upchurch, pers. comm.; Heffernan et al. 2010).

The SRWMD is responsible for issuing water use permits in the region, and in doing so, must ensure that proposed uses are in the public interest, which includes the conservation of fish and wildlife habitat and the protection of recreational values. Water scientists who have noticed the recent trend in the Suwannee River Basin toward longer drought cycles and increased consumptive use of groundwater resources have begun to express strong concerns about lowered water tables and decreased spring flows. Given the projected water supply needs for the area, the USGS predicts that spring flows throughout the state, including those in the Ichetucknee River, will continue to decline (Sepulveda 2002).

The SRWMD is also responsible for prioritizing and establishing MFLs for water bodies within its boundaries. The SRWMD developed an MFL for the Lower Santa Fe River and Ichetucknee River in 2013 (SRWMD 2013). Concurrently, the MFL proposed by the SRWMD for the Middle Suwannee River, which extends from the mouth of the Withlacoochee River south to Fanning Springs, is under review. The Middle Suwannee River is integral to the establishment of the lower Santa Fe River MFL because of the back flooding that occurs periodically in the Ichetucknee River.

Water managers are addressing concerns about the quality and quantity of the water that discharges from the Ichetucknee and other major springs in Florida (Upchurch and Champion 2004). The development of standards for Spring Protection Areas, Springshed Protection Areas, and Surface Water Protection Areas for the Ichetucknee River has evolved into a strategy to protect specific areas in the Ichetucknee watershed from "significant harm" (Chapter 373.042 F.S.). Many of Florida's largest springsheds, including the Ichetucknee, have undergone a detailed delineation process (FGS 2007). Springshed boundaries, however, are not static. Boundaries can change dramatically over time, depending on the amount of consumptive use of groundwater taking place in various parts of the springshed. Recent research has revealed that a significant region of groundwater supply in the eastern part of the SRWMD, considered a groundwater divide of sorts between the SRWMD and the SJRWMD, has declined to the extent that a westward shift in groundwater potentiometric contours has occurred. The shift appears to be in response to the artificial depletion of groundwater reserves caused by large-scale pumping in Duval and Nassau Counties (Grubbs and Crandall 2007). This regional drawdown may be partially responsible for shrinking springsheds and declining spring flows within parts of the SRWMD, including the Ichetucknee (Mirti 2001; Grubbs and Crandall 2007). Both water management districts are now attempting to coordinate more closely when issuing consumptive use permits and monitoring groundwater withdrawals (SRWMD and St. Johns Water Management District

(SJRWMD) 2011). Additionally, there is a real need for Florida's water managers to develop a comprehensive empirically derived water budget for the Floridan aquifer system, one that will help determine sustainable groundwater extraction limits and protect the states aquatic resources from harm (Knight and Clarke 2016).

To study trends within springshed protection areas, the SRWMD has developed a high-resolution monitoring program whereby water levels and water quality are measured in a large number of wells scattered throughout the basin (Upchurch et al. 2001). Now that an MFL for the Lower Santa Fe /Ichetucknee Rivers has been established, implementation of protection areas within those watersheds will likely be based on projected relative impacts of groundwater withdrawals and on vulnerability of the aquifer (SRWMD 2005). If MFLs developed by water management districts are to succeed in providing water bodies with adequate protection against significant harm, it will be important to have a diverse group of stakeholders assist in guiding the MFL process. One responsibility of FDEP is to review annual MFL priority lists submitted by water management districts for water bodies within their regions. Participation by FDEP in the review process is important, especially since significant problems (e.g., declines in spring flows) have already occurred at other springs in DRP District 2 (Madison Blue, Fanning, and Manatee Springs) despite MFLs recently assigned to them (SRWMD 2004; SRWMD 2005). For example, scientists and cave divers have documented, for the first time, a flow reversal at Manatee Spring that lasted over a week (District 2 files). Some experts have also suggested that, due to declining flows, Fanning Spring may no longer rank as first magnitude spring (Tom Greenhalgh, FGS, pers. comm.).

Strong evidence now exists to support the premise that declining spring flow rates correlate with increased nutrient levels in springs and spring runs (Cohen et al. 2007). Given the recent documentation of flow reductions in the Ichetucknee and shrinking springsheds in the SRWMD, it is important that the DRP continue to engage other agencies and the public stakeholders in a cooperative effort to maintain high standards of water resource protection in the Ichetucknee springshed (FSI 2012c). Critical efforts will continue to include close parternship with the SRWMD and other agencies to ensure that the adopted MFLs within the Ichetucknee and Lower Santa Fe rivers are protective and will contribute to the restoration of historic groundwater flows.

Natural Communities

This section of the management plan describes and assesses each of the natural communities found in the state park. It also describes of the desired future condition of each natural community and identifies the actions that will be required to bring the community to its desired future condition (DFC). Specific management objectives and actions for natural community management, exotic species management, and imperiled species management are discussed in the Resource Management Program section of this component.

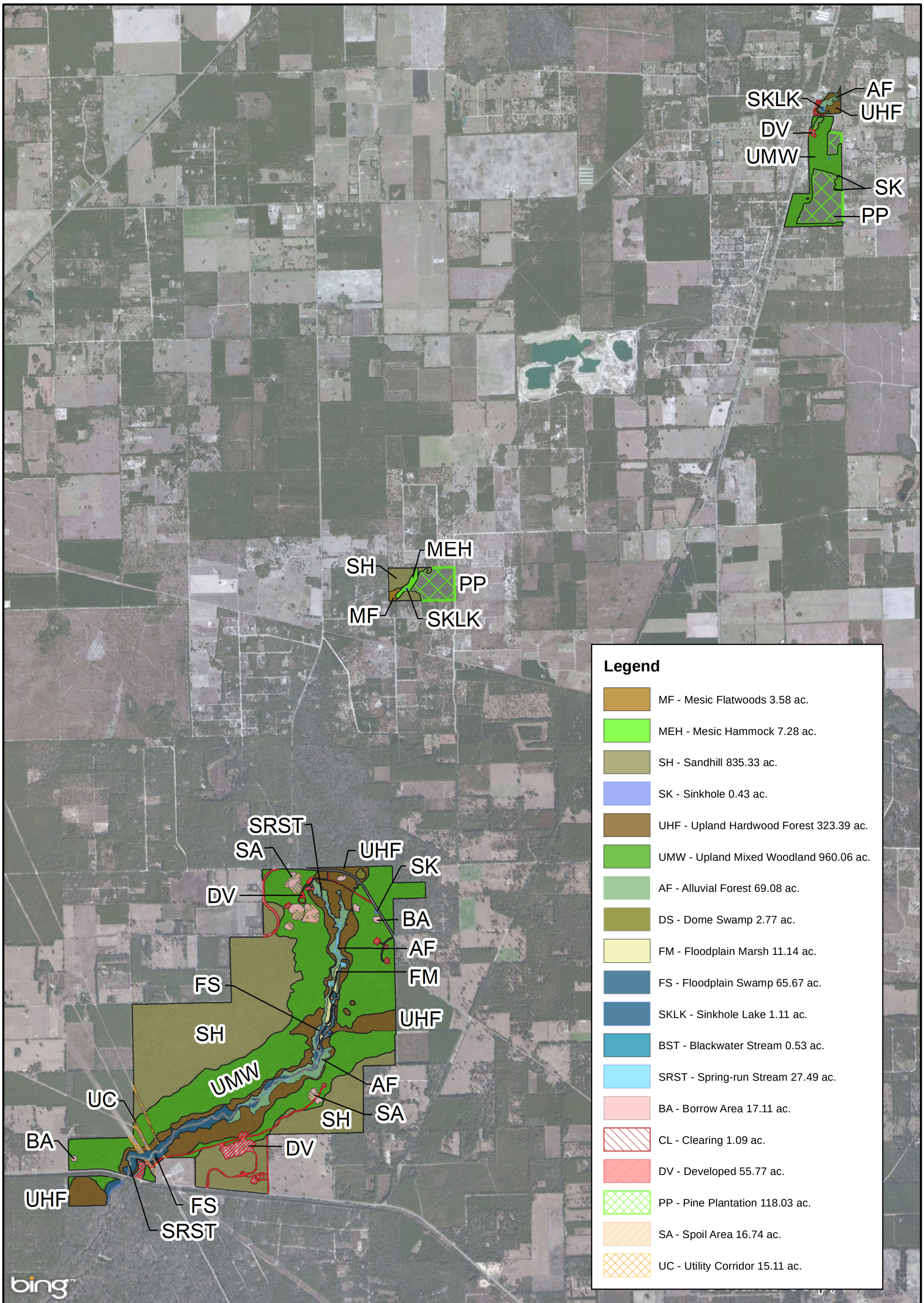
The system of classifying natural communities employed in this plan was developed by the Florida Natural Areas Inventory (FNAI). The premise of this system is that physical factors such as climate, geology, soil, hydrology, and fire frequency generally determine the species composition of an area, and that areas which are similar with respect to those factors will tend to have natural communities with similar species compositions. Obvious differences in species composition can occur, however, despite similar physical conditions. In other instances, physical factors are substantially different, yet the species compositions are quite similar. For example, coastal strand and scrub--two communities with similar species compositions--generally have quite different climatic environments, and these necessitate different management programs. Some physical influences, such as fire frequency, may vary from FNAI's descriptions for certain natural communities in this plan.

When a natural community within a park reaches the desired future condition, it is considered to be in maintenance condition. Required actions for sustaining a community's maintenance condition may include, maintaining optimum fire return intervals for fire dependent communities, ongoing control of non-native plant and animal species, maintaining natural hydrological functions (including historic water flows and water quality), preserving a community's biodiversity, protecting viable populations of plant and animal species (including those that are imperiled or endemic), and preserving intact ecotones linking natural communities across the landscape.

Ichetucknee Springs State Park contains 15 distinct natural communities as well as altered landcover types (see Natural Communities Map). A list of known plants and animals occurring in the park is contained in Addendum 5.

Mesic Flatwoods

Desired future condition: Dominant pines will usually be longleaf pine (*Pinus palustris*) in north Florida. Native herbaceous groundcover should be over at least 50% of the area and should be less than 3 feet in height. Saw palmetto (*Serenoa repens)* and shrub component will comprise no more than 50% of total shrub species cover, and will also be less than 3 feet in height. Shrub species include saw palmetto, gallberry (*Ilex glabra*), fetterbush (*Lyonia lucida*), running oak (*Quercus pumila*), dwarf live oak (*Quercus minima*), shiny blueberry (*Vaccinium myrsinites*), and dwarf huckleberry (*Gaylussacia dumosa*). Shrubs will generally be knee-high or less, and there will be few if any large trunks of saw palmetto along the ground. Optimum fire return interval for this community is 1 to 3 years.



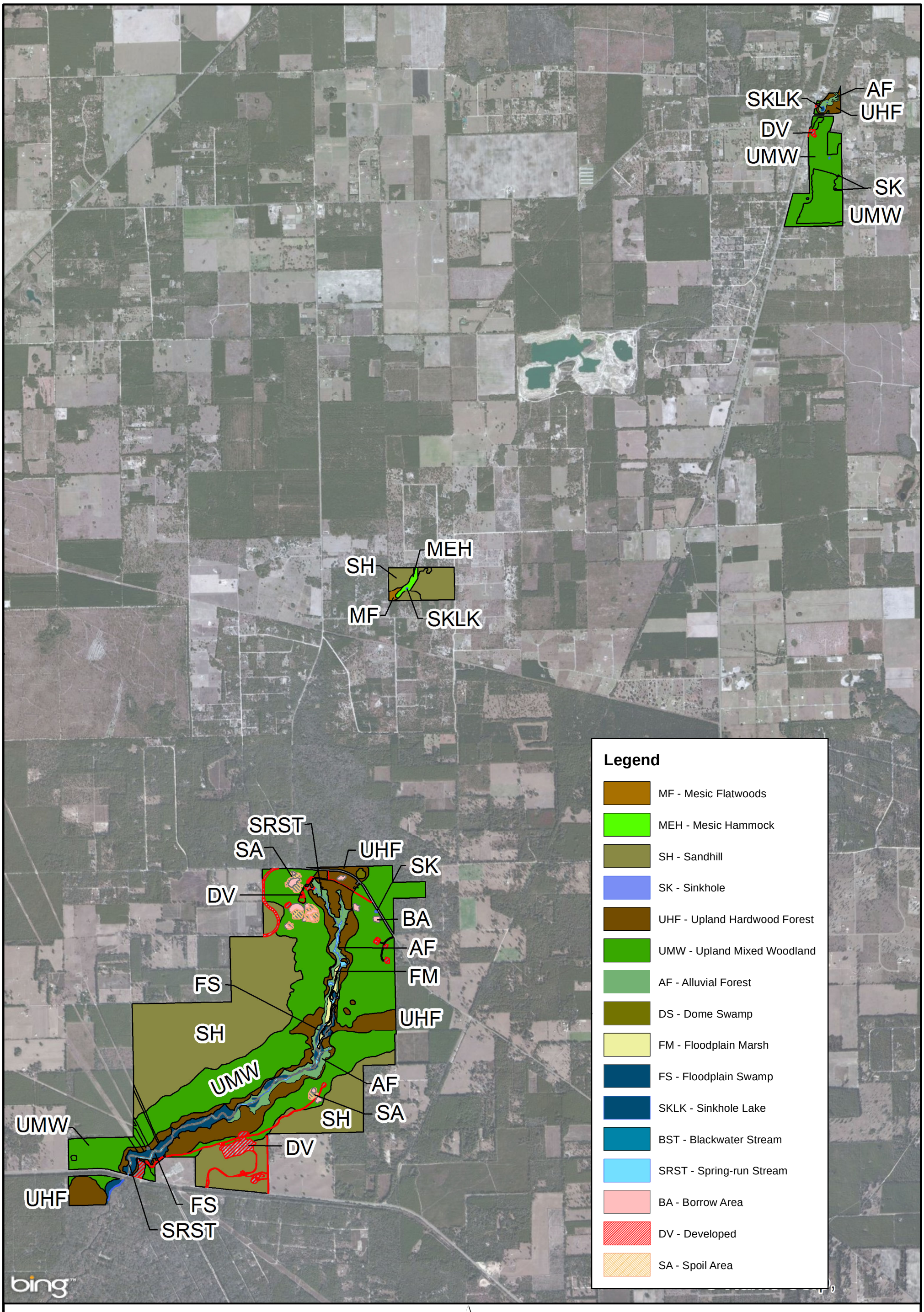
ICHETUCKNEE SPRINGS
STATE PARK

N

0 0.25 0.5 1 Mile

Florida Department of Environmental Protection
Division of Recreation and Parks
Date of aerial; 2011

NATURAL COMMUNITIES
EXISITNG CONDITIONS MAP



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STATE PARK

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Florida Department of Environmental Protection
Division of Recreation and Parks
Date of aerial; 2011

NATURAL COMMUNITIES
DESIRED FUTURE CONDITIONS MAP

Description and assessment: A small area of mesic flatwoods occurs at the southwest corner of the Saylor Sink parcel. The mesic flatwoods lie in the transition zone between the mesic hammock that is associated with the Ichetucknee Trace and the surrounding sandhills. The mesic flatwoods fringe is dominated by saw palmetto, sand live oak (*Quercus geminata*), wild olive (*Osmanthus americanus*), sparkleberry (*Vaccinium arboreum*) and contains scattered gallberry plants. Although this area shares some characteristics with xeric hammock, this is most likely due to long-term fire suppression.

General management measures: Although it is of limited extent, the mesic flatwoods should be burned along with the adjacent sandhills to restore the natural ecotone between the uplands and the Trace. An adequate firebreak will need to be maintained along the south and west boundary lines to facilitate frequent prescribed fires.

Mesic Hammock

Desired future condition: A well-developed evergreen hardwood and/or palm forest which can occur, with variation, through much of peninsular Florida. The typically dense canopy will typically be dominated by live oak (*Quercus virginiana*) with cabbage palm (*Sabal palmetto*) mixed into the understory. Southern magnolia (*Magnolia grandiflora*) and pignut hickory (*Carya glabra*) can be common components in the subcanopy as well. The shrubby understory may be dense or open, tall or short, and will typically be composed of saw palmetto, beautyberry (*Callicarpa americana*), American holly (*Ilex opaca*), gallberry and sparkleberry. The groundcover may be sparse and patchy but will generally contain panic and switchgrasses (*Panicum* sp.), sedges (*Carex* sp.) as well as various ferns and forbs. Abundant vines and epiphytes occur on live oaks, cabbage palms and other subcanopy trees. Mesic hammocks will generally contain sandy soils with organic materials and may have a thick layer of leaf litter at the surface. Mesic hammocks are rarely inundated and not considered to be fire-adapted communities and are typically shielded from fire.

Description and assessment: A thin fringe of mesic hammock lies along the slopes and floor of the Ichetucknee Trace where it passes through the Saylor Sink parcel. Characterized by an open understory with a canopy of live oaks, this community forms the ecotone between the open sandhills and the linear karst depression that forms the Ichetucknee Trace.

General management measures: Mesic hammocks require relatively little management compared to fire-adapted communities. Periodic monitoring for invasive plant species or feral hog damage will be necessary. Fire will be allowed to burn into the edges of the mesic hammock from the surrounding sandhills to maintain an ecotone, but no attempts should be made to introduce intense fires into this community type.

Sandhill

Desired future condition: Dominant pines will be longleaf in north Florida. Herbaceous cover is 80% or greater; less than 3 feet in height. In addition to groundcover and pine characteristics, there will be scattered individual trees, clumps, or ridges of onsite oak species (usually turkey oak (*Quercus laevis*), sand post oak (*Quercus margaretta*), and blue-jack oak (*Quercus incana*)). In old growth conditions, sand post oaks will commonly be 150-200 years old, and the age of some turkey oaks may even exceed 100 years. Optimum fire return interval for this community is 2 to 3 years.

Description and assessment: The sandhill community occurs on higher elevations in the park on the deepest and most well drained soils. Like much of the surrounding region, the sandhills were heavily logged during the early 1900s or before. Most of the longleaf pines were removed at that time. Natural regeneration of longleaf pines occurred to varying degrees. Unlike surrounding areas, however, most of the sandhills at Ichetucknee Springs were not converted to intensive agricultural uses, and the native groundcover remained intact. A period of fire suppression followed the removal of the original longleaf pines over much of the area, resulting in an increase in hardwood densities. The park was acquired from the Loncala Phosphate Company in 1970. Park staff began to prescribe burn the sandhills in 1973 and later began replanting understocked areas with longleaf pines.

Sandhills located west of the Ichetucknee River represent the finest examples of sandhill natural communities in the region, if not statewide. These sandhills are relatively rich with groundcover species diversity. Large expanses of habitat available within the park allow many sandhill animal species that have declined elsewhere to persist on site. Species such as Bachman's sparrow (*Aimophila aestivalis*), southern fox squirrel (*Sciurus niger niger*), and eastern indigo snakes (*Drymarchon couperi*), which are often extirpated in isolated sandhill patches, remain relatively common at Ichetucknee. Florida mice (*Podomys floridanus*) are abundant within the parks sandhills (Doonan 2002) and southeastern American kestrel (*Falco sparverius paulus*) thrives. Longterm survival of such wildlife species requires extensive areas of well-maintained sandhill.

The sandhills to the east of the river are not in as pristine a condition as those to the west. Some of these areas may have been more impacted by phosphate mining operations and low intensity agriculture or grazing. At least one area was cleared and planted with watermelons in the 1950s. This area, in the southern portion of the park, was subsequently converted into a slash pine plantation. The site was heavily thinned by park management around 1977 and has since been replanted with longleaf pines. Although disturbed, this area retains scattered clumps of wiregrass (*Aristida stricta* var. *beyrichiana*) and other characteristic sandhill groundcover species. Some areas of sandhill, particularly those closer to the upland pine and upland mixed woodland, and some areas adjacent to the park boundary have increased numbers of offsite hardwoods due to lack of sufficient fire. In 2008, approximately 125 acres of offsite hardwoods in sandhill, upland pine, and upland mixed woodland communities in management zones 2B, 2C, 2E, 2F, 3B, and 3C. were treated with herbicide to accelerate restoration of those zones.

Other limited areas of sandhill were disturbed to a much greater extent. A tract of approximately 10 acres along the western boundary was converted to agricultural use sometime before 1949. The northern fringe of this tract formerly contained an old residence. The general area is in relatively poor condition due to a lack of native groundcover and canopy species. A second area of about 26 acres, located further south along the western boundary, was not disturbed as severely. This area was cleared of longleaf pines and other canopy species between 1957 and 1963; however, the groundcover was not completely removed. Longleaf pine regeneration is now underway as the result of trees being planted some 20 years ago. Patches of native groundcover occur, as do scattered hardwoods that are typical of the community.

All of the sandhills at the Saylor Sink parcel were cleared of the native longleaf pines by the early 1960s and planted in slash pine. The eastern half of the parcel was cleared and converted to agriculture prior to 1937. According to aerial photography, a thinning cut was conducted between 1994 and 1999. The areas east of the Ichetucknee Trace have an herbaceous groundcover dominated by broomsedge (*Andropogon* spp.) and other weedier types of native groundcover, with an overstory of widely spaced slash pines. The midstory is a mix of scattered hardwood species including laurel oak (*Quercus laurifolia*), bluejack oak, and black cherry (*Prunus serotina*). Structurally the habitat is similar to a natural sandhill. Pocket gophers (*Geomys pinetis*) and widely scattered gopher tortoises are still found on site. Sandhills south and west of the Ichetucknee Trace on the Saylor Sink parcel are characterized by relatively few pines, dominated instead by offsite oaks and hardwoods mixed with native sandhill hardwoods.

General management measures: Fire is the primary tool for maintaining and improving sandhill vegetation. The Ichetucknee sandhills will need frequent prescribed fires to prevent and reverse the invasion of offsite hardwood species. Although growing season fires are preferred to stimulate groundcover response, dormant season fires may be used to reduce hardwood densities and to increase fire frequency. Some sections of the Ichetucknee sandhills will require additional plantings of longleaf pines to supplement previous planting efforts.

The Saylor Sink parcel will require the application of prescribed fire to initiate restoration of the sandhills. In the eastern portion, the planting of longleaf pines and native groundcover such as wiregrass will be additional steps in the restoration process as the current slash pine overstory is gradually replaced. Burning should be frequent in order to expedite restoration and improve habitat for resident gopher tortoises. Removal of offsite hardwoods will also be necessary. Western portions of the parcel may require some level of mechanical or chemical hardwood control when implementing the prescribed fire program and preceding any groundcover restoration efforts. Monitoring, continued treatment of invasive plant species, and removal of feral hogs are additional management measures planned for the park's sandhills.

Sinkhole and Sinkhole Lake

Desired future condition: Sinkholes are characterized by cylindrical or conical depressions with limestone or sand walls. Sinkholes do not contain standing water for long periods of time as do Sinkhole Lakes. Depending upon the age of the sinkhole, the vegetation of sandy sinkholes may represent a well-developed forest including magnolia, sweetgum (*Liquidambar styraciflua*), wax myrtle (*Myrica cerifera*), grape vines (*Vitis* sp.), Virginia creeper (*Parthenocissus quinquefolia*), water oak (*Quercus nigra*), and pignut hickory. Sinkholes with vertical limestone walls may be covered by a variety of mosses, liverworts, ferns, and small herbs. Sinkholes will generally have a very moist microclimate due to seepage, buffering by topographic depression, and shading by tree canopy. Desired future conditions include limiting unnatural erosion and protecting the microclimate from disturbance.

Desired future condition: Sinkhole lakes are relatively permanent and typically deep lakes characterized by clear water with a high mineral content formed in depressions within a limestone base. Vegetative cover may range from being completely absent, consist of a fringe of emergent species or be completely covered with floating plants. Typical plant species may include smartweed (*Polygonum* sp.), duckweed (*Lemna* sp.), bladderwort (*Utricularia* sp.), and rushes (*Juncus* sp.). Desired conditions include minimizing disturbances that cause unnatural erosion and minimizing pollution to the connected aquifer system.

Description and assessment: Due to the karst geology of the region, sinkholes are scattered throughout the park. Solution depressions of differing size and shape are particularly found in the areas above and around the major springs. Some sinks remain dry the entire year, while others contain water either permanently or seasonally. Most of these sinkholes are too small to map at this time. Two small sinkhole depressions, which often retain water, are mapped in the northeast portion of the main park. In most cases, the sinkholes within the park are relatively undisturbed. Vegetation varies from floating or emergent aquatics to herbaceous or woody terrestrial species. At least one sinkhole in the park was used as a trash dump in the past. It is possible that some may have been converted into phosphate pits in the last century, and as such would now be included with the borrow areas.

The Ichetucknee Trace parcels all contain sinkhole lakes, some of which connect directly to underground conduits that feed the Ichetucknee River. These include Rose Sink north of SR 240, and McCormick Sink south of SR 240. Rose and McCormick Sinks have provided access to the conduits for research dives. Saylor Sink, on the Saylor Sink parcel, and an unnamed sinkhole lake on the McCormick parcel retain water, but research as of 2020 has not identified direct connection through the underground conduits.

General management measures: Management of sinkholes and sinkhole lakes must emphasize protection. The edges of sinkholes need to be protected from impacts that could accelerate erosion. This is even more critical with sinkhole lakes since increased levels of erosion can cause a decline in water quality. Access to these areas, particularly the sinkhole lakes, is often restricted except for approved research purposes or other management activities. Monitoring these communities for impacts from invasive plant and animal species will also be necessary.

Upland Hardwood Forest
Desired future condition: Mature, closed canopy hardwood forest typically occurring on slopes and rolling hills with generally mesic conditions. Overstory tree species may consist of southern magnolia, sweetgum, live oak, laurel oak, Florida maple (*Acer saccharinum*) and swamp chestnut oak (*Quercus michauxii*). Understory species will include trees and shrubs such as American holly, flowering dogwood (*Cornus florida*), redbud (*Cercis Canadensis*), red bay (*Persea borbonia*), horse sugar (*Symplocos tinctoria*), and beauty berry. Ground cover will consist of shade tolerant herbaceous species, sedges, and vines.

Description and assessment: Upland hardwood forest within the park has expanded greatly due to fire suppression in the past century. Historical aerials show a relatively thin band of hardwoods of varying width located upslope of the Ichetucknee River floodplain. A thin band of upland hardwood forest also occurs in association with Rose Sink. In the absence of fire, upland hardwood forest species expanded into adjacent upland mixed woodland areas that had been disturbed during timbering operations in the early 1900s. Invasive woody species such as laurel oaks, water oaks, and sweetgums are typical of these upland mixed woodland areas that have "succeeded" to upland hardwood forest. These species are usually precluded from upland mixed woodland by periodic growing season fire.

The boundary between the upland hardwood forest and upland mixed woodland is naturally dynamic and determined by local fire regimes and other disturbances such as windstorms. In the case of Ichetucknee Springs, this natural flux has been overshadowed by extensive logging operations, two periods of phosphate mining, fire suppression, and other anthropogenic influences. For the purposes of the natural community map, and to guide restoration of the upland mixed woodland, the boundary of the upland hardwood forest has been located based on interpretation of 1949 aerial photos. At this time, disturbance from removal of the longleaf pine overstory was still evident in the sandhills and upland mixed woodland. Invasion of these disturbed areas by offsite hardwoods had already begun, but these trees were much smaller than now. Ground truthing of selected areas and mapping of relict longleaf pines and lightered pine stumps (most likely longleaf pine, but possibly slash pine) have also aided in determining the historical limits of the upland hardwood forest along the Ichetucknee River.

Both the upland hardwood forests and upland mixed woodlands have been impacted by phosphate mining operations that constructed multiple pits and tram roads. The topographic disturbances and the soil changes caused by mining residues and tailings have severely affected both communities on a local basis. The upland hardwood forest was undoubtedly subjected to some level of hardwood cutting, but the clearest evidence of timber harvest are the numerous cedar stumps that occur in the upland hardwood forest along the river. These cedar stumps are relatively large in diameter, and the living cedars that remain on site are much smaller.

General management measures: Management of the upland hardwood forests at Ichetucknee Springs State Park will require periodic monitoring and removal of

invasive plant and animal species. Impacts from service roads and trails will also need monitoring. In general, DRP biologists expect the community will gradually recover from previous timber removal with little intervention. Restoration of the phosphate pits, currently considered to consist of borrow and spoil areas, would be difficult and may not be cost effective. In addition, the phosphate pits now represent part of the cultural history of the park.

Upland Mixed Woodland and Upland Pine

Desired future condition: Dominant tree species in the upland mixed woodland will include longleaf pine, southern red oak (*Quercus falcata*), post oak, and mockernut hickory (*Carya alba*). Hardwood tree species will frequently be dominant or co-dominant with pines. Flowering dogwoods may be present. Longleaf pine replaces shortleaf pine (*Pinus echinata*) outside the panhandle, but shortleaf occur in small numbers at Ichetucknee Springs. Percent herbaceous cover will be comparable to sandhill and will be 3-4 feet in height during spring and summer. In some areas, grasses and forbs may reach heights of 6-8 feet or more during the fall (due to blooming of taller grass species such as yellow Indian-grass (S*orghastrum nutans*), silver plumegrass (*Saccharum alopecuroides*), and big bluestem (*Andropogon gerardii*)). In old growth conditions, oaks and hickories will commonly be 150-200 years old. The Optimum fire return interval for this community is 2 to 5 years, depending on adjacent natural communities.

Desired future condition: Dominant tree species in the upland pine will be longleaf pine. Herbaceous cover will be less than 3 feet in height and is comparable to sandhill, but may have a higher density of understory shrubs and saplings. In addition to groundcover and pine characteristics noted previously, mature hardwood trees will be scattered throughout (usually southern red oak, post oak, sand post oak, mockernut hickory, flowering dogwood, and sassafras (*Sassafras albidum*)). In old growth conditions, oak trees and hickories are commonly 150 to 200 years old. Optimum fire return interval for this community is 2 to 3 years.

Description and assessment: As mentioned above in the upland hardwood forest description, the boundary between upland mixed woodland and upland hardwood forests is often indistinct under natural conditions. Under disturbed conditions such as logging and fire suppression, the upland hardwood forest species quickly invade the upland mixed woodland resulting in a blending of the two community types. Such is the case at Ichetucknee Springs.

Upland mixed woodland in peninsular Florida, also known as Southern Red Oak Woods (Duever et al 1997), is a broad transition zone between sandhill or upland pine and non-fire adapted communities such as upland hardwood forest or floodplain communities. This transition zone often occurs on soils that are intermediate in drainage and fertility characteristics between sandhill and upland hardwood forest soils. Fire also exerts a defining influence on the limits of the upland mixed woodland. Typically, upland mixed woodland burns with a frequency similar to neighboring sandhills or upland pine, and much more frequently and intensely than adjacent upland hardwood forests.

At Ichetucknee Springs the long history of fire suppression and timbering has blurred the distinctions between the three "high pine" communities that are dominated by longleaf pine. Once lumped within upland pine, the upland mixed woodland has only recently been formally designated by FNAI as a distinct community type. Upland mixed woodland lies closest to the river. It is likely that upland pine once occurred between the deep well-drained sands of the sandhills and the less well-drained loamy soils of the upland mixed woodland. Fire suppression of the upland pine has led to the loss or suppression of the native groundcover species (particularly wiregrass), and an increase in hardwoods, making it difficult to distinguish between upland mixed woodland and upland pine. For the purposes of this management plan, the upland pine has not been mapped separately from the upland mixed woodland.

Upland mixed woodland and upland pine at Ichetucknee Springs span a broad range of quality. Some limited areas that have suffered less fire suppression are in very good to excellent condition. These areas retain diverse groundcover dominated by grasses, including wiregrass in the case of the upland pine. Beargrass (*Yucca filamentosa*) and longleaf paw paw (*Asimina longifolia*) are also common. Overstory includes adult longleaf pines, mockernut hickories, southern red oaks, and scattered sand post oaks. In general, upland pine areas near the sandhills are in better condition as they were often burned along with the sandhills when fire was reintroduced to the park in the early 1970s. As more fire is introduced into the upland pine and upland mixed woodlands, responses by remnant groundcover should distinguish these similar community types. Additional research and ground truthing will be needed as these areas improve. Future groundcover restoration goals will need to be based on the correct community designation.

One factor that has influenced the boundary between the sandhills and the upland pine is an old abandoned trail or road that was located along the historic ecotone between these communities on the west side of the river. This old trail was probably cut before the 1920s when Loncala Phosphate, Inc. acquired the property (Doig, 1992). The trail has acted as a firebreak, and it appears to have prevented fires from penetrating the upland pine area. Consequently, the invasion of the upland pine by non-fire adapted hardwoods such as laurel oak, water oak and sweetgum seems to have been accelerated. Park personnel have made great strides throughout the park in restoring areas of "overgrown" upland pine to a more natural state. Using prescribed fire, coupled with girdling and herbiciding of offsite hardwoods, the park has been able to reverse many years of fire suppression. By concentrating hardwood removal in the fringes of overgrown upland pine nearest the sandhills, and in those areas, that still have relict longleaf pines, the park has succeeded in encouraging prescribed fires to penetrate formerly overgrown areas, dramatically enhancing the degraded upland pine community. The most recent hardwood removal project at Ichetucknee Springs chemically treated approximately 125 acres of offsite hardwoods in sandhill, upland pine, and upland mixed woodland communities in management zones 2B, 2C, 2E, 2F, 3B, and 3C.
The McCormick parcel in the Ichetucknee Trace is likely to have been upland mixed woodland or upland pine originally, and in some areas, there are remnant longleaf pines and scattered clumps of wiregrass. Predominately, the property was cleared

for agriculture prior to 1937. Most of those agricultural fields were planted in pines in more recent years. These areas are currently mapped as pine plantations.

General management measures: Restoration of a natural fire regime to the upland pine and upland mixed woodland is essential for recovering these rare and unique community types. Reintroducing fire will require additional hardwood removal efforts to allow prescribed fires to penetrate further into areas currently dominated by offsite species of hardwoods. Some hardwood treatment areas may also need restoration of groundcover species. Restoration of the upland pine and upland mixed woodland is discussed further in the Resource Management Program section of this component. As restoration proceeds, staff will continue to monitor these areas for rare species that are endemic to these communities.

On the McCormick parcel, removal of the planted pines and replanting with longleaf pines and groundcover species will be necessary to initiate restoration of these heavily impacted areas. Some limited prescribed fires may be useful in managing the pine plantations in the meantime. Additional boundary fencing was installed at the McCormick parcel in 2009 along with fencing and boundary line improvements on a new acquisition north of CR 238 in the main section of the state park.

Dome Swamp

Desired future condition: Isolated, forested, depression wetland occurring within a fire maintained matrix such as Mesic Flatwoods. The characteristic dome appearance is created by smaller trees that grow on the outer edge (shallower water and less peat) and the larger trees that grow in the interior. Pond cypress (*Taxodium ascendens*) will typically dominate, but swamp tupelo (*Nyssa sylvatica* var. *biflora*) may also form a pure stand or occur as a co-dominant. Other subcanopy species can include red maple, dahoon holly (*Ilex cassine*), swamp bay (*Persea palustris*), sweetbay (*Magnolia virginiana*), and loblolly bay (*Gordonia lasianthus*). Shrubs can be absent to moderate (a function of fire frequency) and can include Virginia willow (*Itea virginica*), fetterbush, buttonbush (*Cephalanthus occidentalis*), wax myrtle, and titi (*Cyrilla racemiflora*). An herbaceous component can range from absent to dense and include ferns, maidencane (*Panicum hemitomom*), sawgrass (*Cladium jamaicense*), sedges, lizards tail (*Saururus cernuus*), and sphagnum moss (*Sphagnum* sp.). Vines and epiphytes will be commonly found. Maintaining the appropriate hydrology and fire frequency is critical for preserving the structure and species composition of the community. Dome swamps should be allowed to burn on the same frequency as adjacent fire type communities, allowing fires to naturally burn across ecotones. Fires should be appropriately planned to avoid severe fuel consumption within the dome swamp.

Description and assessment: A single dome is found in the northeast corner of the park adjacent to County Road 238. This dome is dominated by hardwoods including swamp tupelo, red maple (*Acer rubrum*) and overcup oak (*Quercus lyrata*) (Herring 1994). This dome appears to have been impacted by the construction of County Road 238 that passes through the park. The southern tip of the dome was cut off from the main part of this depressional wetland by the fill brought in to construct the roadway. During high water events, overflow from the dome is channeled into

the roadside swale and then under County Road 238 through a culvert. The portion of the depression that lies to the south of the road is classified as impoundment or artificial pond since it appears to have been significantly altered during or after construction of the road. The dome that lies north of the road is in relatively good condition although it receives some direct runoff from County Road 238.

General management measures: Fire may be allowed to creep into eastern edges of the dome from adjacent upland mixed woodland, but is likely to be an infrequent event. Maintenance of a natural hydrological regime is a more important factor in management of this dome swamp. Although affected by runoff from County Road 238, the hydrological regime appears adequate for maintenance of this community. As in all areas, monitoring for invasive species impacts will continue.

Alluvial Forest

Desired future condition: Seasonally flooded, closed canopy, hardwood forest that occurs on ridges or slight elevations within the floodplain of alluvial rivers. Typical overstory trees may include overcup oak, water hickory (*Carya aquatica*), American elm (*Ulmus americana*), laurel oak, and red maple. Understory species may include swamp dogwood (*Cornus foemina*), willow species (*Salix* sp.), and American hornbeam (*Carpinus caroliniana*). Presence of groundcover will be variable. Species such as netted chain fern (*Woodwardia areolata*) and other shade-tolerant herbaceous species may be present.

Description and assessment: Alluvial forest is found along much of the Ichetucknee River down slope of the upland hardwood forest and upland mixed woodland. In some cases, a floodplain swamp or marsh separates the alluvial forest from the spring-run stream. The most extensive floodplain development is in the lower half of the river, although a significant area of alluvial forest occurs near the Ichetucknee Headspring and along the Cedar Head Spring run. Although the larger cypress trees (*Taxodium distichum*) were removed from the floodplain, the floodplain is recovering and with time will regain its former grandeur.

The low area associated with the Rose Creek drainage is classified as alluvial forest since it floods frequently and is associated with a blackwater stream system. However, near Rose Creek Sink, the area is dominated by grasses and other herbaceous plant species rather than by hardwood species normally associated with floodplains. This may be attributable to repeated natural flooding events that may have prevented the establishment of hardwoods, or to some anthropogenic disturbance in the past that cleared the area around the sink. It is possible that the area could have been used to water livestock in the past, which might explain the current open conditions.

General management measures: Maintenance of a natural hydrological regime is critical to the long-term health of floodplain communities. Many of the efforts detailed in the Hydrology section above, designed to protect the spring-run stream, also apply to the alluvial forest. Monitoring for impacts from invasive plant species and feral hogs will also continue.

Floodplain Marsh
Desired future condition: Emergent herbaceous and low shrub species will be dominant over most of the area, and there will be an open vista. Trees are few, and if present, will occur primarily in the deeper portions of the community. Due to the relatively stable spring-run stream, the community will be ordinarily inundated. Dominant vegetation in Floodplain Marsh includes wild rice (*Zizania aquatica*), maidencane, panicum, cutgrass (*Leersia* sp.), common reed (*Phragmites australis*), pickerel weed (*Pontederia cordata*), arrowheads (*Sagittaria* sp.), buttonbush, St. John's wort (*Hypericum* sp.), and coastal plain willow (*Salix caroliniana*). Floodplain marsh dominants will also typically include sand cordgrass (*Spartina bakeri*) and sawgrass. Optimum fire return interval for this community is 2 to 10 years depending on fire frequency of adjacent communities.

Description and assessment: The middle reach of the Ichetucknee River is dominated by floodplain marsh in the area known as Grassy Flats. The marsh is best developed between Mission and Mill Pond Springs where the main channel passes through a broad shallow area. Dominated by wild rice, the marsh is comprised of many emergent aquatic plants rooted within the spring-run stream. High water during the winter of 1998 suppressed, or killed back, most of the emergent aquatic plants within the floodplain marsh. As water levels returned to normal during the spring and summer of 1998, however, recreational use of the Ichetucknee River, primarily tubing, impeded regrowth of the emergent aquatic vegetation due to trampling. Lack of vegetation left the main channel of the river unmarked and many recreational users ran aground in the shallows of Grassy Flats. Fortunately, the floodplain marsh community is very resilient and the emergent vegetation has made an almost complete recovery. Invasive exotic water lettuce (*Pistia stratiodes*) has been a chronic problem in the spring-run and floodplain marsh communities. A systematic and dedicated program of manual removal has dramatically reduced the occurrence of this species.

General management measures: Maintenance of a natural hydrological regime is critical to the long-term health of floodplain communities. Many efforts detailed in the Hydrology section, designed to protect the spring-run stream, also apply to floodplain marsh. Since the Ichetucknee River is relatively stable and non-fire adapted communities border its floodplain marsh, fire plays a lesser role in the maintenance of this community. Monitoring for impacts from invasive plant and animal species will continue.

Floodplain Swamp
Desired future condition: Frequently or permanently flooded community in low lying areas along streams and rivers. Soils will consist of a mixture of sand, organics, and alluvial materials. In north Florida, the closed canopy will typically be dominated by bald cypress, but commonly includes tupelo species as well as water hickory, red maple, and overcup oak. Trees bases are typically buttressed. Understory and groundcover will be typically sparse.

Description and assessment: Floodplain swamp straddles the lower reaches of the Ichetucknee River within the park. Cypress dominates this community, which

typically occurs down slope of the alluvial forest and the various upland community types. In many cases, floodplain swamp and alluvial forest are difficult to distinguish from each other and form a complex mosaic based on local topography. Like alluvial forest, floodplain swamp was historically logged for large cypress trees, now making a steady but gradual return to previous conditions.

General management measures: Maintenance of a natural hydrological regime is critical to the long-term health of floodplain communities. Many of the efforts detailed in the Hydrology section above designed to protect the spring-run stream, also apply to the floodplain swamp. Monitoring for impacts from invasive plant species and feral hogs will also continue.

Blackwater Stream

Desired future condition: Blackwater streams are characterized as perennial or intermittent watercourses originating in lowlands where extensive wetlands with organic soils collect rainfall and runoff, discharging it slowly to the stream. The brown-stained waters will be laden with tannins, particulates, and dissolved organic matter derived from drainage through adjacent swamps, producing streams that have sandy bottoms overlain by organic matter. Emergent and floating vegetation including golden club (*Orontium aquaticum*), smartweeds (*Polygonum* spp.), grasses and sedges will sometimes occur, but they are often limited by steep banks and dramatic seasonal fluctuations in water levels. Minimizing disturbances and alterations and preserving adjacent natural communities will be important considerations during management.

Description and assessment: Rose Creek is a blackwater stream that forms a portion of the headwaters of the Ichetucknee River. It flows within the park for a short distance before sinking into Rose Creek Swallet and flowing underground. The stream is in good condition within the park. Additional information on the Rose Creek system may be found in the Hydrology section above.

General management measures: The blackwater stream should be protected from erosion impacts within the park, and wherever possible, upstream of the park as well. Any decline in water quality of Rose Creek can have impacts on the Ichetucknee River downstream.

Spring-Run Stream

Desired future condition: Perennial water courses which derive most, if not all, of their water from limestone artesian openings to the underground aquifer carry waters that are cool, clear, and circumneutral to slightly alkaline. These factors allow for optimal sunlight penetration and minimal environmental fluctuations which promote plant and algae growth. Such characteristics of the water can change significantly downstream as surface water runoff becomes a greater factor. Areas of high flow typically have sandy bottoms while organic materials concentrate around fallen trees and limbs and slow-moving pools. Typical vegetation includes strap-leaf sagittaria, tapegrass, water milfoil (*Myriophyllum heterophyllum*), muskgrass (*Chara* spp.), creeping primrosewillow (*Ludwigia repens*), arrowheads, southern naiads (*Najas guadalupensis*), and pondweeds (*Potamogeton* sp.).

Description and assessment: The striking clarity and beauty of the Ichetucknee River rate it as one of the best, if not the premier, example of a spring-run stream in Florida. Protected from development and most sources of water quality damage, the river was the primary focus of the park's designation as a National Natural Landmark and a State Natural Feature Site. Flowing for about 3.5 miles through the park, the river eventually joins with the Santa Fe River about 1.5 miles downstream of the park boundary. Two major springs (Ichetucknee Headspring and Blue Hole) and a lesser one (Cedar Head Spring) feed the upper reach of the Ichetucknee River. The run from Cedar Head actually flows into Blue Hole, where it merges with that spring's flow to form a short but voluminous run to the main river channel. Numerous smaller spring-run streams and seepages along the edges of the river and within the adjacent floodplain contribute to the flow of the river. Additional descriptions of the springs may be found in the Hydrology section above.

The river has long been attractive to outdoor recreation enthusiasts. However, beginning in the 1960s, the river became increasingly popular for tubing and scuba diving. These activities, in addition to swimming, subjected this aquatic system to highly intensive, and potentially destructive, pressures. Extensive damage occurred to both the stream vegetation and stream bottom, particularly in the narrow, shallow, upper reaches of the river.

Monitoring of the visitor impacts on the spring-run stream began with a study by Charles DuToit in the late 1970s (DuToit 1979). Between 1979 and 1989, the river was monitored using photo points at key locations along the river. In 1989, formal line-intercept transects were installed on the river to monitor seasonal and annual vegetation changes. Additional information on the monitoring methods and results may be found in the Hydrology section above.

After the implementation of successively lowered carrying capacities on the river in 1978, 1983, and 1989, the Ichetucknee began to show a remarkable degree of recovery. Fencing of the runs below the Head Spring and Blue Hole also helped to limit the destruction that was taking place in the highly vulnerable upper reach of the river. When it appeared that sediments were accumulating on the downstream side of the existing barrier, staff replaced the fence below the Head Spring with a buoy line. "Restricted Area" signs were used to discourage tubers from wading upstream and disturbing the submerged vegetation. Barriers still remain at Blue Hole Spring. The downstream fence may ultimately be replaced with a buoy line rather than continuing to maintain it.

In recent years, water quality issues have increasingly threatened the spring-run stream. Elevated nutrient levels in the groundwater are causing increased periphyton growth on submerged aquatic vegetation in the river. The river is also experiencing higher turbidity associated with peak periods of recreational use. Foot traffic on the river bottom and the uprooting of aquatic vegetation tend to cause an increase in suspended sediments and silt in the water column, and a corresponding decrease in sunlight penetration, particularly in the upper reaches of the river (WSI 2011). Turbidity, coupled with increased periphyton growth, appears to be having a

harmful effect on submerged aquatic vegetation, and by extension, the species that depend on them. Formerly exacerbating this problem was a large and widespread infestation of the floating exotic plant, water lettuce, which once extended the length of the river and at times covered the Grassy Flats section from bank to bank. Although mainly occurring along shorelines and backwaters of the river and other areas with low flow rates, the water lettuce had a large impact on submerged aquatic vegetation by blocking sunlight. In response to the threat, park staff organized a large-scale, volunteer-based effort, directed by a part-time employee who also conducted supplementary lettuce removal. The project has been very successful in removing water lettuce manually from the majority of the river over the past decade. This manual removal program reduced the water lettuce infestation to maintenance levels without the use of herbicides, and enabled the removal of excess biomass from the river rather than allowing it to decompose in place. Additional information on the condition of the spring-run stream is detailed in the Hydrology section above.

General management measures: Management of complex aquatic systems is a difficult task. Since many factors affecting the spring-run stream originate outside the park within the Ichetucknee springshed, management considerations must necessarily extend beyond the park boundary. Protection of groundwater sources within the Ichetucknee springshed will be a priority. Park and district staffs will continue to work with the Santa Fe River Springs Basin Working Group and to coordinate the numerous research projects associated with the river and its springshed. Staff will continue the vegetation transect monitoring that tracks changes in aquatic plant coverage and diversity.

Water quality issues that originate within the park are mostly related to recreational use. The greatest impacts from foot traffic are in the shallower reaches of the river, primarily in the upper portions. Sediments disrupted in shallow areas cause increased turbidity far downstream from the original point of disturbance. Efforts to educate visitors to refrain from touching the bottom or damaging aquatic plants are underway. However, a reallocation of the carrying capacity is recommended to restore and preserve the upper portion of the river (FDEP 2017). Shifting all of the tubing use to the Midpoint Launch and increasing access to the upper river for canoes and kayaks would achieve a higher level of protection for the upper river while still allowing recreational access.

The park will continue to remove water lettuce manually to keep the infestation at maintenance levels. The restriction on motorized craft will be continued to help prevent the introduction of the invasive exotic aquatic plant, hydrilla (*Hydrilla verticillata*), into the park from the Santa Fe River.

Subterranean Cave—Aquatic

Desired future condition: Characterized as cavities below the ground surface in karst areas. A cave system may contain portions classified as Terrestrial Caves and portions classified as Aquatic Caves. The latter vary from shallow pools highly susceptible to disturbance, to more stable, totally submerged systems. Cave

systems are extremely fragile. Desired future conditions include protecting against alterations that may increase pollution in aquatic systems.

Description and assessment: Aquatic caves are associated with all of the springs within the park to a greater or lesser extent and lie beneath much of the main park as well as the Ichetucknee Trace. Aquatic caves that are accessible to scuba divers require careful management to protect them from misuse. Springs and sinks that can provide access for divers include Blue Hole Spring, Rose Sink, and McCormick Sink. The only public cave diving access is at Blue Hole Spring. All other cave entrances are restricted to permitted research dives only. At Blue Hole Spring, the cavern through which divers pass before entering the cave was defaced in the past with graffiti. Volunteers with the North Florida Springs Alliance removed the graffiti in 2013, although some evidence of the scarring remains. As part of the Ichetucknee Hydrology Study, the accessible portions of the Blue Hole Cave were mapped and filmed by a team of cave divers (Skiles et al 1991).

General management measures: Periodic monitoring of the aquatic caves by cave divers will allow staff to monitor impacts on the aquatic caves, particularly Blue Hole Spring. Research dives at Rose Sink and McCormick Sink provide details on the condition of those caves. Current research projects include mapping of the cave system between Rose Sink and McCormick Sink. Erosion of the slopes above the sinkhole lakes must also be monitored and corrected to prevent siltation of the aquatic caves.

Altered Landcover Types

Desired future condition: Where altered landcover types occur, desired future conditions will typically be the historical natural community types described above.

Borrow Area

A borrow pit and dump were located in the southwest portion of the park adjacent to the park boundary. The desired future condition is upland mixed woodland. Restoration of this site may not be a high priority, and would require filling, contouring, and replanting of upland mixed woodland species.

Other borrow areas are associated with phosphate mining pits in the north end of the park. The topographic and soil changes associated with the phosphate pits prevent typical restoration efforts. Since these would require significant expense to restore, and they have some historical significance, the desired future condition for these mine pits will be borrow areas. Management measures for these areas include control of priority invasive plant species.

Clearing/Regeneration

The only clearings in the park are associated with the public road right-of-ways at the western edge of the Rose Sink parcel. The desired future condition for this area is upland mixed woodland. Replanting with canopy tree species and groundcover will be necessary, along with removal of non-native grasses and weeds.

Developed

Developed areas at the park include two shop complexes, park residences, parking lots, picnic areas, several bathhouses, and restrooms and other support structures. The stormwater basin constructed at Rose Sink to prevent runoff from entering the cave system is classified as developed. The former private residence on the McCormick parcel and associated out buildings are included as developed. The developed areas within the park will be managed to minimize the effect of the developed areas on adjacent natural areas. Priority invasive plant species (EPPC Category I and II species) will be removed from all developed areas. Other management measures include proper stormwater management and development guidelines that are compatible with prescribed fire management in adjacent natural areas. Due to the nature of the karst features in the region, particular emphasis will be placed on proper treatment of sewage originating from the developed areas of the park. Advanced treatment systems may be required to ensure that septic system effluent does not contribute to a decline in groundwater quality.

Impoundment/Artificial Pond

A depressional wetland located south of County Road 238 was probably at one time part of the dome community north of the road, but was cut off by construction of the road. This area appears to have been modified, perhaps to increase storage of runoff from the roadway. At this time, no restoration is planned for this impoundment and the desired future condition is impoundment/artificial pond.

Pine Plantation

Pine plantations are located on the McCormick and Saylor parcels. The pine plantations on the McCormick parcel have a desired future condition of upland mixed woodland or possibly upland pine. Most of the planted pines on the McCormick parcel were planted on abandoned pastures or fields that were cleared for agricultural uses prior to 1937 (the earliest available aerial photography). These agricultural fields were then converted to planted pines at some point after 1956. It is likely that most of these pines were harvested at least once and replanted. The large pine plantation in the southern end of the McCormick parcel was harvested and replanted in the early 1990s. Restoration of agricultural fields planted with pines to upland mixed woodland, while technically feasible, would require significant resources to restore the diverse groundcover that defines this community type. Thinning or removal of the slash pines and replanting with longleaf pines is an interim measure that would allow restoration of a fire regime. The pine plantations on the McCormick parcel were thinned in 2017 to initiate restoration. Control of priority invasive plant species is particularly important in these areas, since many invasive species take advantage of disturbed areas.

The Saylor Sink parcel was cleared for agriculture and subsequently planted with slash pines. Some native grasses and herbaceous species were retained on site. This area will be restored to sandhill through thinning or removal of the slash pines and replanting with longleaf pines. Removal of offsite hardwoods and groundcover restoration may also be required.

Road
Roads within the park include the paved north and south entrance roads and the tram road. The desired future condition is road. Management measures include proper stormwater treatment and prevention of erosion along the roads. Speed limits are posted and should be enforced to minimize the impact of the internal roadways on wildlife species by reducing road kills.

Spoil Area
Most of the spoil areas that are located within the main park are associated with the phosphate mining operations described in the Topography section above. The spoil piles are adjacent to the borrow areas. In most cases, restoration of these disturbed areas to their former natural communities is not likely due to the extent of the damage. Although the planted slash pines in the phosphate settling ponds could be removed, the extensive changes to the soil profile would preclude restoration to a moderately well-drained upland pine or upland mixed woodland. Since the phosphate pits have some historical significance, the desired future condition for these spoil piles will be spoil areas. Management measures for these areas include control of priority invasive plant species.

Utility Corridor
Significant electric utility line corridors are maintained by Duke Energy at the southern end of the park. The lines run NNW across the park from the power substation located on U.S. 27. Removal of the tree canopy occurred many years prior to state acquisition and these areas are kept open by routine maintenance. Should these utility corridors ever be abandoned, the desired future conditions would include upland mixed woodland, upland hardwood forest, and floodplain swamp. General management measures include control of priority invasive plant species and prescribed fire in the upland mixed woodland. The park coordinates with Duke Energy to try to minimize the impacts of the utility corridors on adjacent natural communities.

Imperiled Species

Imperiled species are those that are (1) tracked by FNAI as critically imperiled (G1, S1) or imperiled (G2, S2); or (2) listed by the U.S. Fish and Wildlife Service (USFWS), Florida Fish and Wildlife Conservation Commission (FWC) or the Florida Department of Agriculture and Consumer Services (FDACS) as endangered, threatened or of special concern.

Ichetucknee Springs State Park has a rich diversity of plant and animal life, including a variety of imperiled species. Botanical studies (Herring and Judd 1995; P.M. Brown pers. comm.) have documented many of the rare plant species within the park. Staff observations and past monitoring efforts have also documented rare vertebrate species within the park.

Many of the imperiled animal species are associated with the sandhill and upland pine natural communities. These include the gopher tortoise (*Gopherus polyphemus*), southern fox squirrel, short-tailed snake (*Lampropeltis extenuata*),

southeastern American kestrel, and eastern indigo snake. Continued restoration of fire-adapted upland communities will only serve to benefit these species.

The park has been recording observations of imperiled animal species since acquisition in the 1970s, although most observations date from the 1990s to the present. Numerous observations are summarized in spreadsheets, supplemented by hardcopies of the original data forms showing specific map locations.

The Florida manatee (*Trichechus manatus latirostris*) is a visitor to the park, particularly in the winter months. It is likely that manatees are attracted to the warm waters of the river during cold weather. It is not known if the lower numbers of manatees observed in the warmer months are due to increased recreational use of the river. Since 1992, all manatee sightings by staff or park visitors have been recorded in a database along with date, location, and river stage data. Manatee access to the Ichetucknee from the Santa Fe River may be affected by water levels. The Ichetucknee River is classified as a Secondary Warm-Water Refuge in the Florida Manatee Warm-Water Action Plan (Valade et al. 2020). The river is considered to have medium or low thermal quality.

Park staff made a considerable commitment to monitoring the gopher tortoise population closely and to mapping burrow locations within burn zones. Staff has marked several hundred individual tortoises since 1997, and recorded recaptures. A long-term marking system has been adopted using a standard numbering system based on drilling small holes in the marginal scutes. Basic data were collected on each marked and released tortoise, including a visual inspection for signs of Upper Respiratory Tract Disease (URTD). This disease, caused by the bacterium *Mycoplasma agassizii*, was confirmed at Ichetucknee Springs in the early 1990s. All tortoises within the park are considered potential carriers of the disease. While handling gopher tortoises, staff should take care not to allow tortoises to contact each other. All surfaces that the animals touch should be sprayed with a weak chlorine bleach solution (1 to 30 ratio of bleach to water) to kill the bacterium. Staff should also wash their hands between handling tortoises to reduce risk of disease transmission. Gopher tortoises should not be subjected to unnecessary stress. Stress has been linked to the onset of URTD symptoms. Staff have continued to cooperate with researchers from the University of Florida College of Veterinary Medicine and with the Florida Fish and Wildlife Conservation Commission.

One source of transmission of this potentially fatal disease between tortoise populations is the practice of capturing tortoises in developed areas or on roadways and releasing them into protected areas such as state parks. These misguided attempts to aid tortoises may actually endanger many more tortoises. There are many anecdotal accounts of tortoises being released by park visitors into state parks, including Ichetucknee Springs.

In 2014, the park was included in an FWC-funded gopher tortoise population study using Line Transect Distance Sampling techniques conducted by staff of the Jones Ecological Center (Smith et al 2009). The LTDS technique provides more accurate and statistically valid estimates of gopher tortoise populations. Over 13.5

kilometers of transects were walked in the park. The estimated density of 3.97 tortoises/ha was the third highest recorded in the study which included 26 state-managed public lands. The park is estimated to have 1269 gopher tortoises with lower and upper confidence limits of 962 and 1675 tortoises. The burrows had an occupancy rate of 44%. The study also included vegetation monitoring as part of a habitat suitability ranking. Ichetucknee Springs was ranked as a high-quality site with a viable tortoise population in suitable habitat (Smith and Howze 2016). The park has a Tier 1 ranking in the Survey Prioritization Blueprint (FWC 2018) and is a high priority for future surveys.

Several species have historically been harvested for meat in the region. These include the gopher tortoise, Suwannee (river) cooter (*Pseudemys concinna suwanniensis*) and Suwannee alligator snapping turtle (*Macrochelys suwanniensis*). Harvest or possession of gopher tortoises was prohibited statewide in 1988. Taking of Suwannee cooters and alligator snappers from the wild was prohibited in 2009. In addition, species of similar appearance are protected from collection from the wild. These include all Florida turtles of the genus *Pseudemys* and the common snapping turtle (*Chelydra serpentina*). Collection of these species, or any other turtle for that matter, is prohibited within state park boundaries. The area under park jurisdiction includes the length of the Ichetucknee River within the park boundary as well as a 400-foot zone from the edge of mean high water along sovereign submerged lands of the Ichetucknee River below U.S. Highway 27.

In 2007, Dr. Peter Meylan was contracted for a population survey of turtles in the Ichetucknee River. Suwannee cooter was one of the most abundant species within the park (Chapin and Meylan 2011). Additional surveys in 2014 and 2015 were conducted by Dr. Jerry Johnston of Santa Fe College in cooperation with the North American Freshwater Turtle Working Group. These surveys included captures of Suwannee alligator snapping turtles and showed an increase in the number of adult Suwannee cooters compared to the 2007 study. It is thought that the increase was related to extended dark water conditions in the Santa Fe River causing the Suwannee cooters to seek food in clear water systems (Johnston 2016).

A southeastern American kestrel nest box program supplements natural cavities that may be scarce within the park. Staff and volunteers run the program each breeding season. In addition to monitoring nest boxes, the park cooperates with a USFWS-permitted bird bander to band and patagial-tag the young kestrel chicks for future identification. In 2008, the park joined with FWC in their Southeastern American Kestrel Conservation Partnership to increase monitoring and improve habitat management for southeastern American kestrels (Miller 2008).

In 2009, transects were placed in the sandhills to monitor Bachman's sparrows and other bird species listed as Species of Greatest Conservation Need (FWC 2005), including redheaded woodpecker (*Melanerpes erythrocephalus*), common ground dove (*Columbina passerina*), northern bobwhite (*Colinus virginianus*), brown-headed nuthatch (*Sitta pusilla*), and swallow-tailed kite (*Elanoides forficatus*). Everglades snail kites (*Rostrhamus sociabilis plumbeus*) have been rarely sighted in

the park in the past. With the large breeding population currently established in nearby Alachua County, sightings may become more frequent.

Road kills are a persistent problem for imperiled species at the park. Numerous road-killed gopher tortoises and indigo snakes have been documented over the years on park roads and on U.S. Highway 27 along the park's southern boundary. Recording road kills is part of the park's wildlife monitoring program. The park will continue to work with FDOT to investigate ways to reduce road kills.

The park also shelters the only known locality of Ichetucknee siltsnail (*Floridobia mica*), discovered in 1962 by Fred Thompson of the Florida Museum of Natural History. This species of snail only occurs at Coffee Spring on the western edge of the Ichetucknee River. Additional surveys in 1989 by Dr. Thompson failed to find any other populations, but documented that the snail was still as abundant as it was in 1962 (Thompson 1989). Staff erected a fence across the mouth of the Coffee Spring run to exclude recreational tubing from the spring and damaging the microhabitat where the snail occurs. Qualitative surveys prior to 2004 indicated the siltsnail population may have declined compared to earlier surveys. In 2015, FWC researchers conducted the first quantitative monitoring assessment for Ichetucknee siltsnail at Coffee Spring (Warren and Bernatis 2015). Siltsnail was moderately abundant and showed high juvenile recruitment, indicating a healthy population. Several threats to the siltsnail have been identified, including declining spring flows in the Ichetucknee River basin, and water quality, specifically elevated nitrate levels and potential for point source contamination within the springshed. The unknown source of the Coffee Spring groundwater supply is problematic. An additional threat to the siltsnail is the recent appearance of the exotic quilted melania snail (*Tarebia granifera*) and red-rimmed melania (*Melanoides tuberculata*). Both species are known to displace native snail species. Additional quantitative surveys will be conducted by FWC to monitor population changes. A second imperiled snail species, the black-crested elimia (*Elimia albanyensis*), was documented by Dr. Thompson at Coffee Spring in 2000 during a survey of the Ichetucknee siltsnail. Black-crested elimia also occurs at several locations in the Apalachicola River drainage.

Aquatic cave systems within the park and the Ichetucknee Trace harbor several species of troglobitic cave crayfish. Of note is the state-listed Santa Fe cave crayfish (*Procambarus erythrops*), documented at Saylor Sink (T. Morris pers. comm.). FWC has developed a Species Action Plan for this species (FWC 2013). Additional species may be recorded as cave exploration continues within the Ichetucknee Trace.

Many rare plant species occur at Ichetucknee Springs State Park, and several of these, particularly the orchids, are relatively cryptic and difficult to find except when in bloom. It is possible that park development or recreational use could inadvertently damage or extirpate some populations of cryptic species. Florida willow (*Salix floridana*) is another rare species that may be overlooked. Although previously documented, Florida willow has not been observed since the flooding event of winter 1998. A 2003 survey of former locations failed to find any specimens remaining in the park.

Table 5 contains a list of all known imperiled species within the park and identifies their status as defined by various entities. It also identifies the types of management actions currently being taken by DRP staff and identifies the current level of monitoring effort. The codes used under the column headings for management actions and monitoring level are defined following the table. Explanations for federal and state status as well as FNAI global and state rank are provided in Addendum 6.

Table 5. Imperiled Species Inventory

Common and *Scientific* Name	**Imperiled Species Status**				**Management Actions**	**Monitoring Level**
	FWC	**USFWS**	**FDACS**	**FNAI**		
PLANTS						
Harvest-lice *Agrimonia incisa*			LT	G3, S2	1,6	Tier 1
Eastern sweetshrub *Calycanthus floridus*			LE	G5, S2		Tier 1
Spiked crested coralroot *Hexalectris spicata*			LE			Tier 1
Cardinalflower *Lobelia cardinalis*			LT		4	Tier 1
Florida milkvine *Matelea floridana*			LE	G2, S2	1,6	Tier 1
Angle pod *Matelea gonocarpos*			LT			Tier 1
Trailing milkvine *Matelea pubiflora*			LE		1,6	Tier 1
Giant orchid *Pteroglossaspis ecristata*			LT	G2G3, S2	1,6	Tier 1
Florida willow *Salix floridana*			LE	G2, S2	4	Tier 2
Lacelip ladiestresses *Spiranthes laciniata*			LT		1	Tier 1
Lesser ladiestresses *Spiranthes ovalis*			LE			Tier 1
Crane-fly Orchid *Tipularia discolor*			LT			Tier 1
Threebirds orchid *Triphora trianthophoros*			LT			Tier 1
Rainlily *Zephyranthes atamasca*			LT			Tier 1
INVERTEBRATES						
Black-crested Elimia *Elimia albanyensis*				G3Q, S1	4,10	Tier 2
Ichetucknee siltsnail *Floridobia mica*				G1, S1	4,9,10	Tier 3

Table 5. Imperiled Species Inventory						
Common and *Scientific* Name	**Imperiled Species Status**				**Management Actions**	**Monitoring Level**
	FWC	**USFWS**	**FDACS**	**FNAI**		
Hobbs' cave amphipod *Crangonyx hobbsi*				G2G3, S2S3	4,10	Tier 2
Santa Fe cave crayfish *Procambarus erythrops*	ST			G1, S1	4,10	Tier 2
Alachua Light-Fleeing Cave Crayfish *Procambarus lucifugus*				G2G3, S2S3	4,10	Tier 2
Pallid cave crayfish *Procambarus pallidus*				G2G3, S2S3	4,10	Tier 2
North Florida spider cave crayfish *Troglocambarus maclanei*				G2, S2	4,10	Tier 2
Gopher Tortoise Noctuid Moth *Idia gopheri*				G2G3, S2S3	1,6	Tier 1
REPTILES						
American alligator *Alligator mississippiensis*	FT (S/A)	SAT		G5, S4	10	Tier 1
Eastern indigo snake *Drymarchon couperi*	FT	LT		G3, S3	1,6,13	Tier 1
Gopher tortoise *Gopherus polyphemus*	ST			G3, S3	1,6,13	Tier 3
Short-tailed snake *Lampropeltis extenuata*	ST			G3, S3	1,6	Tier 1
Suwannee alligator snapping turtle *Macrochelys suwanniensis*	ST			G2, S2	2,4	Tier 1
Florida pine snake *Pituophis melanoleucus mugitus*	ST			G4, S3	1,6	Tier 1
BIRDS						
Little Blue Heron *Egretta caerulea*	ST			G5, S4	2,4	Tier 2
Tricolored Heron *Egretta tricolor*	ST			G5, S4	2,4	Tier 2
Swallow-tailed Kite *Elanoides forficatus*				G5, S2		Tier 2
Southeastern American Kestrel *Falco sparverius paulus*	ST			G5T4, S3	1,5,6	Tier 5

Table 5. Imperiled Species Inventory						
Common and *Scientific* Name	**Imperiled Species Status**				**Management Actions**	**Monitoring Level**
	FWC	**USFWS**	**FDACS**	**FNAI**		
Wood Stork *Mycteria americana*	FT	LT		G4, S2	2,4	Tier 2
Everglades Snail Kite *Rostrhamus sociabilis plumbeus*	FE	LE		G4G5, S2	4	Tier 1
MAMMALS						
West Indian manatee *Trichechus manatus*	FT	LT		G2, S2	4,10	Tier 2

Management Actions:

1. Prescribed Fire
2. Exotic Plant Removal
3. Population Translocation/Augmentation/Restocking
4. Hydrological Maintenance/Restoration
5. Nest Boxes/Artificial Cavities
6. Hardwood Removal
7. Mechanical Treatment
8. Predator Control
9. Erosion Control
10. Protection from Visitor Impacts (establish buffers)/Law Enforcement
11. Decoys (shorebirds)
12. Vegetation planting
13. Outreach & Education
14. Other

Monitoring Level:

Tier 1. Non-Targeted Observation/Documentation: includes documentation of species presence through casual/passive observation during routine park activities (i.e. not conducting species specific searches). Documentation may be in the form of *Wildlife Observation Forms*, or other district specific methods used to communicate observations.

Tier 2. Targeted Presence/Absence: includes monitoring methods/activities that are specifically intended to document presence/absence of a particular species or suite of species.

Tier 3. Population Estimate/Index: an approximation of the true population size or population index based on a widely accepted method of sampling.

Tier 4. Population Census: A complete count of an entire population with demographic analysis, including mortality, reproduction, emigration, and immigration.

Tier 5. Other: may include habitat assessments for a particular species or suite of species or any other specific methods used as indicators to gather information about a particular species.

Detailed management goals, objectives, and actions for imperiled species in this park are discussed in the Resource Management Program section of this component and the Implementation Component of this plan.

Exotic and Nuisance Species

Exotic species are plants or animals not native to Florida. Invasive exotic species are able to out-compete, displace or destroy native species and their habitats, often because they have been released from the natural controls of their native range, such as diseases, predatory insects, etc. If left unchecked, invasive exotic plants and animals alter the character, productivity, and conservation values of the natural areas they invade.

Ichetucknee Springs State Park contains a variety of invasive exotic plants, mainly located in areas of previous disturbance such as former phosphate pits and old house sites. A primary exception to this is the presence of water lettuce in the Ichetucknee River. Invasive exotic plant infestations also occur at the Saylor Sink, McCormick Sink and Rose Sink properties. Additional surveying and mapping of invasive exotics is needed on those properties, as well as in the main park. Even areas that historically have been free of invasive exotic plants need to be included in a periodic survey schedule so that any new infestations that appear may be detected early and treated quickly. All invasive exotic plant populations need prioritization for removal based on their potential to spread aggressively through the park. Staff should seek funding for exotics removal annually, not only from DRP and FDEP sources, but also through FWC grants.

One of the most invasive species now widespread in the main park is Japanese climbing fern (*Lygodium japonicum*). Even though much of the infestation occurs in old phosphate pits, staff should aggressively pursue its control since it has the capacity to spread out from these disturbed areas. The Rose Sink and Saylor Sink properties also have some Japanese climbing fern. Both the McCormick and Rose Sink properties have old house sites containing a diversity of exotics, including ardisia (*Ardisia crenata*), heavenly bamboo (*Nandina domestica*) and silverthorn (*Eleagnus pungens*). The McCormick parcel also has a pine plantation in which mimosa (*Albizia julibrissin*) is scattered throughout. A small infestation of cogongrass (*Imperata cylindrica*) on the roadside edge of zone 2H is of particular concern and must be prevented from spreading into the park's sandhill community.

DRP staff will continue the highly effective program of water lettuce removal. This volunteer based manual removal program has successfully controlled water lettuce in the majority of the spring-run stream and floodplain marsh in the park without the use of herbicides. The water lettuce control is now in maintenance phase.

Exotics have been treated in-house at Ichetucknee, and Rose and Saylor Sinks. Ichetucknee proper and the McCormick property have each received contract treatments as well. Because of the diversity and widespread distribution of the exotics at McCormick, staff will need to develop a control plan specifically for this site. Since approval of the last Ichetucknee Unit Management Plan in 2000, through FY 2014/15, over 1,200 acres of exotic plants have been treated at the park.

In addition to the FLEPPC-listed invasive exotic plant species mentioned above, the non-native grass, sweet tanglehead (*Heteropogon melanocarpus*), is an increasing

problem at Ichetucknee, particularly at the southern end of the park along U.S. 27. This grass, which mowers have apparently spread for miles along U.S. 27, is gradually moving into the sandhills from the road shoulder. The park needs to develop and implement a plan to control this species and prevent it from encroaching further into the sandhill.

Another exotic species not listed by FLEPPC is showy rattlebox (*Crotalaria spectabilis*), which occurs sporadically in disturbed areas in the park and could become problematic in the sandhills. Staff should monitor for this species regularly as a preventative measure to ensure it does not begin to proliferate in the future.

To prevent mowers from inadvertent introduction of invasive exotic plants, staff should develop and implement a protocol for inspecting and cleaning equipment prior to entry into the park. This is critically important since cogongrass now occurs on the road shoulder in one area of the park. A well-designed protocol could help ensure that the equipment is free of contamination from seeds or other propagules of exotic plants.

Table 6 contains a list of the Florida Exotic Pest Plant Council (FLEPPC) Category I and II invasive, exotic plant species found within the park (FLEPPC 2017). FLEPPC compiles invasive species lists that are revised every two years. Professional botanists and others perform exhaustive studies to determine invasive exotic plants that should be placed on the lists. Invasive exotic plants are termed Category I when they are altering native plant communities by displacing native species, changing community structures or ecological functions, or hybridizing with natives. This definition does not rely on economic severity or geographic range of the problem, but on documented ecological damage. Category II invasive exotics have increased in abundance or frequency but have not yet altered Florida plant communities to the extent shown by Category I species. The table also identifies relative distribution for each species and the management zones in which they are known to occur. An explanation of the codes is provided following the table. For an inventory of all exotic species found within the park, see Addendum 5.

Table 6. Inventory of FLEPPC Category I and II Exotic Plant Species

Common and *Scientific* Names	**FLEPPC Category**	**Distribution**	**Management Zone**
PLANTS			
Mimosa *Albizia julibrissin*	I	1	IS-1Es
		2	IS-2C, IS-3A, IS-4F, IS-5, IS-6
Ardisia *Ardisia crenata*	I	2	IS-6
Air potato *Dioscorea bulbifera*	I	1	IS-6
Cogongrass *Imperata cylindrica*	I	1	IS-2H
Japanese climbing fern *Lygodium japonicum*	I	1	IS-1Ds, IS-2C, IS-2G, IS-4E
		2	IS-2G, IS-2H, IS-4A, IS-4B, IS-5
		3	IS-6
Heavenly bamboo *Nandina domestica*	I	2	IS-6
Water lettuce *Pistia stratiotes*	I	1	IS-3Cs
		2	IS-2G, IS-3A, IS-3Cn, IS-3D, IS-4B, IS-4C, IS-4D, IS-4E, IS-4F
Chinese tallowtree *Sapium sebiferum*	I	1	IS-3B, IS-6
		2	IS-6
Tungoil tree *Aleurites fordii*	II	2	IS-2C, IS-3A
Silverthorn *Eleagnus pungens*	II	2	IS-6
Chinaberry *Melia azedarach*	II	2	IS-6
Wisteria *Wisteria sinensis*	II	2	IS-2C, IS-3A, IS-6

Distribution Categories:

0 = No current infestation: All known sites have been treated and no plants are currently evident.
1 = Single plant or clump: One individual plant or one small clump of a single species.
2 = Scattered plants or clumps: Multiple individual plants or small clumps of a single species scattered within the gross area infested.
3 = Scattered dense patches: Dense patches of a single species scattered within the gross area infested.
4 = Dominant cover: Multiple plants or clumps of a single species that occupy a majority of the gross area infested.
5 = Dense monoculture: Generally, a dense stand of a single dominant species that not only occupies more than a majority of the gross area infested, but also covers/excludes other plants.
6 = Linearly scattered: Plants or clumps of a single species generally scattered along a linear feature, such as a road, trail, property line, ditch, ridge, slough, etc. within the gross area infested.

Exotic animal species include non-native wildlife species, free-ranging domesticated pets or livestock, and feral animals. Because of the negative impacts to natural systems attributed to exotic animals, the DRP actively removes exotic animals from state parks, with priority being given to those species causing the most ecological damage.

In some cases, native wildlife may also pose management problems or nuisances within state parks. A nuisance animal is an individual native animal whose presence or activities create special management problems. Examples of animal species from which nuisance cases may arise include raccoons, gray squirrels, venomous snakes and alligators. Nuisance animals are dealt with on a case-by-case basis.

Feral hogs (*Sus scrofa*) have become problematic in the park; primarily by rooting in areas near the river. The DRP will continue to aggressively pursue removal of the hogs in order to protect the numerous cultural sites in the park as well as the river floodplain, other wetlands, and upland natural communities, particularly the sandhills. Other exotic animal species, including stray dogs, cats and armadillos (*Dasypus novemcinctus*), will be removed using appropriate techniques. Since approval of the last Unit Management Plan for Ichetucknee in 2000, through Fiscal Year 2014-2015, a total of 195 nuisance or exotic animals, comprising nine different species, have been removed from the park.

In 2002, red bay ambrosia beetle (*Xyloborus glabratus*) was first detected in the United States in southeast Georgia. The beetle carries the fungal pathogen (*Raffaelea lauricola*) which it transmits to red bay trees (*Persea borbonia*) and other species in the Lauraceae family, causing laurel wilt disease and death. The beetle and its associated pathogen spread rapidly, and by 2005, it had appeared in Duval County, Florida. In 2008, the disease was discovered in Columbia County. Since that time, most of the adult red bays in the park have died. The beetle (and laurel wilt) has now spread throughout most of Florida and into many of the neighboring states. Although most of the adult red bays have been top-killed, the trees continue to resprout from their roots. It may be that members of the Lauraceae family will continue to survive in shrub form as the remnant tree root systems continue to resprout. At this point, much remains unknown about the long-term impacts of this disease on red bays and other Lauraceae. The park should continue to restrict the movement of firewood in and out of the park and educate visitors about the issue.

Detailed management goals, objectives, and actions for management of invasive exotic plants and exotic and nuisance animals are discussed in the Resource Management Program section of this component.

Special Natural Features

Certainly, the most significant natural feature at Ichetucknee Springs State Park is the Ichetucknee River and its associated springs. Designated as a National Natural Landmark and a State Natural Feature Site, the river is considered one of the crown jewels of the Florida State Park system. Despite the heavy recreational use that the

river endures in the summer tubing season, much of the river retains its natural character. The surface of the Ichetucknee in winter barely hints at the torrent of humanity that floated along it a few months previous. But changes have indeed been happening below the surface. Recreational use has heavily impacted submerged aquatic vegetation in the Head Spring reach of the river, while at Mission and Devil's Eye Springs, the submerged aquatic vegetation is dominated by periphyton and has experienced mass die-offs since 2000. Long-term preservation of the Ichetucknee will require strict adherence to carrying capacities and close monitoring of recreational, industrial, and agricultural impacts. Unmarred by development on its banks, this river was once a pristine example of a spring run. In recent years, however, like so many of our springs, the Ichetucknee has been slowly damaged from afar. Nitrates, pesticides and other pollutants, carried in runoff to sinks or percolating through the soil, have found their way into the underground conduits that feed the Ichetucknee. Awareness of these impacts to the watershed increased due in large part to the efforts of the Ichetucknee Springs Basin Working Group and other working groups. Numerous studies have been funded to find the sources of the Ichetucknee and to identify threats to water quality in the spring basin.

Cultural Resources

This section addresses the cultural resources present in Ichetucknee Springs State Park which may include archaeological sites, historic buildings and structures, cultural landscapes and collections. The Florida Department of State maintains the master inventory of such resources through the Florida Master Site File (FMSF). State law requires that all state agencies locate, inventory and evaluate cultural resources that appear to be eligible for listing in the National Register of Historic Places. Addendum 7 contains the management procedures for archaeological and historical sites and properties on state-owned or controlled properties, the criteria used for evaluating eligibility for listing in the National Register of Historic Places and the Secretary of Interior's definitions for the various preservation treatments (restoration, rehabilitation, stabilization and preservation). For the purposes of this plan, significant archaeological site, significant structure and significant landscape means those cultural resources listed or eligible for listing in the National Register of Historic Places. The terms archaeological site, historic structure or historic landscape refer to all resources that will become 50 years old during the term of this plan.

Condition Assessment

Evaluating the condition of historic structures and landscapes is accomplished using a three-part evaluation scale, expressed as good, fair and poor. These terms describe the present condition, rather than comparing what exists to the ideal condition. Good describes a condition of structural stability and physical wholeness, where no obvious deterioration other than normal occurs. Fair describes a condition in which there is a discernible decline in condition between inspections, and the wholeness or physical integrity is and continues to be threatened by factors other than normal wear. A fair assessment is usually cause for concern. Poor describes an unstable condition where there is palpable, accelerating decline, and physical

integrity is being compromised quickly. A resource in poor condition suffers obvious declines in physical integrity from year to year. A poor condition suggests immediate action is needed to reestablish physical stability.

Level of Significance

Applying the criteria for listing in the National Register of Historic Places involves the use of contexts as well as an evaluation of integrity of the site. Every cultural resource's significance derives from historical, architectural or archaeological contexts. Evaluation will result in a designation of NRL (National Register or National Landmark Listed or located in an NR district), NR (National Register eligible), NE (not evaluated) or NS (not significant) as indicated in the table at the end of this section.

For collections, there are no criteria for use in determining the significance of collections or archival material. Usually, significance of a collection is based on what or whom it may represent. For instance, a collection of furniture from a single family and a particular era in connection with a significant historic site would be considered highly significant. In the same way, a high-quality collection of artifacts from a significant archaeological site would be of important significance. A large herbarium collected from a specific park over many decades could be valuable to resource management efforts. Archival records are most significant as a research source. Any records depicting critical events in the park's history, including construction and resource management efforts, would all be significant. The following is a summary of the FMSF inventory. In addition, this inventory contains the evaluation of significance.

Prehistoric and Historic Archaeological Sites

Desired future condition: All significant archaeological sites within the park that represent Florida's cultural periods or significant historic events or persons are preserved in good condition in perpetuity, protected from physical threats and interpreted to the public.

Description: Ichetucknee Springs State Park contains 51 archaeological sites and three resource groups including two designated as a district (8CO49 and 8SU345) and one designated as a linear resource (8CO57). These sites represent diverse cultural resources that range from the Paleoindian era to the Spanish Colonial Aboriginal contact era and to the 19th and 20th Century mill and phosphate mine era. In fact, the entire park has been recorded in the Florida Master Site File as the Ichetucknee River Archaeological Zone (8CO49 and 8SU345). A predictive model for the park was completed in 2012 (Collins et al 2012).

The park has several types of prehistoric sites. There are three confirmed burial sites at Ichetucknee, with at least three additional mounds that may or may not contain burials. Additionally, two sites are prehistoric campsites, two are prehistoric habitations and two are classified as quarries. Numerous sites are classified as

artifact scatters including lithics, ceramics or both. Several of these sites occur underwater. Very little information is available for other sites.

Aboriginal occupation of the area, based on artifacts found within the park, spans the entire length of Florida's Indian ethnohistory as defined by Milanich (1990). A few Paleoindian artifacts have been recovered from the park (11,500 B.C. to 9,500 B.C.). Archaic period (9,500 B.C. to 1,500 B.C.) tools have also been recovered from Ichetucknee, as has late Archaic pottery. Scattered artifacts from the Deptford period (500 B.C. to A.D. 200) have been found in the river and along the riverbanks.

Archaeological remains from the Weeden Island culture (A.D. 200 to A.D. 1000) include scattered ceramics, a habitation and two burial mounds, one of which has been looted and may not be presently recorded with the Florida Master Site File (possibly formerly 8SU29, Weisman 1990). The transition period between the Weeden Island and Leon-Jefferson periods is the Suwannee Valley period (A.D. 750 to currently unknown). The period of European contact, or Spanish Mission period, which is characterized by Leon-Jefferson series ceramics, covers the time span of circa A.D. 1585 to circa 1700.

Important paleontological resources have been recovered from the riverbed and associated springs within the park. In 2003, a portion of a Pleistocene mastodon (*Mastodon americaneus*) skull was discovered in the Ichetucknee. Other Pleistocene mammal remains found in the park include mammoth (*Mammuthus*), horse (*Equus*), tapir (*Tapirus*), giant jaguar (*Felis atrox*), saber-tooth cat (*Smilodon fatalis*), bison (*Bison antiquus*) and other extinct and living species. The Ichetucknee River lies in an area where the Ocala Group limestones reach at least mean sea level and very often extend above the ground surface. Stratigraphy of the limestone deposits, combined with periodic flooding, is responsible for its continual erosion and redeposition of fossil-bearing Pleistocene soils along the watercourse. Fossils have been recovered at several archaeological sites.

The best-documented site at Ichetucknee Springs is the Fig Springs site (8CO1). Refuse dating to the Spanish period was discovered in Fig Spring in the late 1940s by John Goggin (Deagan 1972), who surmised the artifacts in the spring were refuse from a nearby Spanish Mission. Artifacts collected at Fig Springs by John Goggin (of the University of Florida) have been extensively studied and dated (Deagan 1972). The actual mission site was not located until a field crew lead by Ken Johnson (1990) discovered mission artifacts, human burials and a possible clay floor on a nearby bluff in 1986. Until the most recent work at Fig Springs from 1988 to 1990, it was assumed that the Fig Springs Mission was the Santa Catalina de Afuerica, based on written mission locations. However, as a result of the recent work that involved excavations and intensive study of many facets of the site by a team of researchers, the current thought is that the Fig Springs Mission is the mission San Martín de Timucua (also called San Martín de Ayaocuto) (Weisman 1991 & 1992).

Since 1972, 14 surveys have occurred within the park or along its perimeter. One survey took place in a disjoint park parcel. All surveys were performed prior to construction activities (Weisman 1989a). In 2001, a pre-construction survey of the park's new Administration, Education and Exhibit Center was conducted. No cultural resources were found at that location. In 2006, a Phase 1 survey of the Rose Creek Sink coincided with the acquisition of the property and the construction of a retention pond built to protect the water quality of the sink and the Ichetucknee River and springs (Dickinson and Wayne 2006). One site occurs in the area of the survey, 8CO33. It contains a mix of historic refuse, the remains of a mid-20th Century habitation, and culturally undiagnostic lithic debitage that is characteristic of a hunting site. Two other recently acquired parcels, McCormick Sink and Saylor Sink, have not been surveyed.

Prior to 2001, five sites were the subjects of small studies. A salvage investigation was conducted near 8SU28 before expansion of the Head Spring parking area in 1972 (Clauser 1972). The researcher concluded that the site had been disturbed previously, but recovered materials spanning from the Deptford period (500 BC) to the Alachua period (A.D. 1539). Dampier's landing (8CO15) has also been studied, primarily to recover Pleistocene fossils. This study recovered very few cultural remains (Cring 1989). Midpoint Mound (8CO43) and Mill Pond (8CO8) were also excavated (Weisman, 1989b).

Nearly half of the recorded sites at Ichetucknee Springs State Park are prehistoric sites. The historic sites are mostly 20th Century, and many of them are associated with the phosphate mining industry. Three of the historic sites have 17th Century Spanish artifacts. Historic sites from the 19th and 20th centuries include an old mill site, the old Bellamy Road, disturbed areas such as phosphate pits and tram beds that are associated with phosphate mining, a 20th Century habitation that has been demolished, and historic refuse. In addition to Fig Springs, the old Bellamy Road (8CO57) and the Old Mill Pond site (8CO08) are likewise important archaeological sites. Old Bellamy Road, the historic road that connected Tallahassee and St. Augustine, passes near the Ichetucknee Head Spring. Alternate names of this road, the Old Spanish Trail and the Old Indian Trail, suggest it may have been used in prehistoric times as well. The other important recorded site with an historic component is the Old Mill Pond site (8CO08). With the influx of agriculture into this area in the 1800s, a grist mill was established at what is now known as Mill Pond Springs. A mill race was cut into the limestone bank next to the spring. A log dam was placed in the spring run to divert water into the race to turn the mill wheel. Evidence of the mill race still exists, e.g. slots for the wheel and portions of the log dam. Interviews from Old Timers Days, though undocumented, suggest that the town of Ichetucknee was located near Old Mill Pond. The town reportedly had a post office, general store and several residences, the locations of which are unknown (Bradbury and Hallock 1962). Spanish artifacts that date to the 17th Century have also been found at Old Mill Pond, as have aboriginal artifacts (Weisman 1989b).

Park staff has documented previously unrecorded cultural resources, which are scattered throughout the park, and submitted them to the Division of Historical Resources. While these have been assigned FMSF numbers, in the future the park

may want to consolidate some of the ones associated with phosphate mining into fewer FMSF sites. Tram roads and other roads could be recorded as one Resource Group with the FMSF in the future, instead of individually. Phosphate was first mined at Ichetucknee between 1900 and 1920. Black laborers removed the phosphate with picks and shovels and used wheelbarrows to haul it away until a boiler was built and steam-powered winches were put into use. A tram road was constructed that bridged the Ichetucknee River at "Trestle Point". The tram road was part of a maze of narrow-gauge railroads that existed in Florida at the time. During this period, only "pure rock" phosphate was taken. Around 1943, the value of the residue left behind by these early miners was realized and mining crews returned to retrieve it. Using modern equipment, the operation lasted until about 1967. This was the last time phosphate was mined from the property. Numerous mine pits and tram roads still exist in the park.

From about the time the grist mill was established until shortly after the first phase of phosphate mining had begun, turpentining operations were conducted in the virgin pine forests. Evidence of the turpentine industry still exists in the form of "catface" scars on a few of the older trees. Most of the mature trees, however, were timbered by the early 1920s. Cedars were also cut from the lands adjacent to the river, purportedly for the manufacture of pencils in Perry, Florida, and many stumps remain along the river near Cedar Head Run.

Remnants of a moonshine still (CO1022), including large pieces of the boiler, have been found along Cedar Head Run. No information is available as to when or how long the still was in operation. At least three old home sites, and likely more, occur on park property. One is located in the northwest corner of the park and another on the west side of the river near the south end of the park. An old log cabin was situated in the Head Spring area. Numerous landings, likely dating from the early 20th century, also occur along the river.

Ichetucknee Springs State Park has created a program called "Old Timers Day", held once a year, when persons with historical knowledge are interviewed. These interviews have yielded accounts of many potential unrecorded cultural resources. Some of the resources mentioned include the Town of Ichetucknee near Old Mill Pond, numerous home sites, and an old wagon road. A historic unmarked graveyard was reported outside the park boundary.

Condition assessment: The majority of the archaeological sites are in good condition. Those that are in fair condition are 8CO1, 8SU310 and 8SU249. As noted at the time of recording the sites with the FMSF, one site, 8SU28, is in poor condition because it was partially bulldozed.

In 1999, most of the sites that were recorded at that time were visited during a Resource Management Evaluation. There was no evidence of looting, storm damage, or other accelerating factors (Younker 1999). These sites were revisited in 2009. The 22 recently recorded sites were visited during December 2009 and January 2010.

Site 8CO1 is a proposed national register site. It is listed in fair condition because of potential impacts from tree roots and possibly feral hogs. The site needs a maintenance plan and a preservation protocol to address the best ways of protecting it.

Site 8SU249 is also listed in fair condition because it is in the powerline right of way. There is the ongoing potential that powerline maintenance activities might affect it.

8SU310 was recorded during the course of the ongoing restoration of the Ichetucknee Head Spring. It is listed in fair condition because restoration activities have the potential to impact the site. Restoration, which began in 1994, is discussed in the Hydrology section. As the restoration progressed to deeper levels, more prehistoric artifacts were recovered. Park staff requested assistance from the Division of Historical Resources. To date, historic and prehistoric artifacts have been recovered along with rubble, sand and silt. Recovered artifacts have been transferred to the Bureau of Archaeological Research, DHR, through an existing procedure. Over the course of this project, concerns have been raised about the method of restoration and its potential to impact archaeological resources. Some have suggested that a geoarchaeological-based methodology could best guide the restoration project and help avoid archaeological as well as geological impacts.

8SU28 is listed in poor condition because it was partially destroyed by a bulldozer and because the proposed extension of CR 238 would further impact the site.

The increasing numbers of feral hogs in the park pose a potential threat to all of the terrestrial archaeological sites.

Level of significance: The park is designated the Ichetucknee River Archaeological Zone (sites 8CO49 and 8SU345). Most of the 54 archaeological sites have not been evaluated yet, however.

Two sites are considered National Register eligible, 8CO1 and 8CO408. Four sites, 8CO33, 8CO942, 8SU28 and 8SU251, have been evaluated as not significant. The remaining sites need evaluation.

General management measures: 8CO1, a proposed national register site, needs a preservation protocol and maintenance plan that addresses the best methods of protecting the site. Potential threats to the site include impacts from tree roots and possible damage by feral hogs. Potential solutions that should be considered in a preservation protocol and maintenance plan for the site include mowing, trapping of feral hogs, or other measures.

Site 8SU249, located in a powerline right-of-way, needs a preservation protocol and maintenance plan that will help protect it during powerline maintenance activities.

A restoration plan for the Headspring is needed to protect site 8SU310 and to guide restoration activities. A geoarchaeologically-based methodology should be one of the techniques considered when developing this plan in order to avoid archaeological and geological impacts during restoration.

Historic Structures

Desired future condition: All significant historic structures and landscapes that represent Florida's cultural periods or significant historic events or persons are preserved in good condition in perpetuity, protected from physical threats and interpreted to the public.

Description: There are five historic structures recorded in the park.

The south end of Ichetucknee Springs State Park had a roadside park built by the Department of Transportation sometime between the 1950s and when the park was acquired in 1970. The McCormick parcel contains three 20th Century structures: a house, a pole barn and a tobacco barn. Another historic structure, the Ironwood House, was recorded near Rose Sink (CO941) but was subsequently demolished or collapsed.

The three structures at the McCormick home site are recorded as the house (CO1033), tobacco barn (CO1086), and pole barn (CO1085). The Old South Use Area (former DOT Wayside Park) historic structure (CO1034) included concrete picnic pavilions and benches. The picnic pavilions and benches were documented and removed in 2013. CO941 was removed sometime soon after January 23, 2006.

Condition assessment: The former DOT Wayside Park pavilion structures CO1034 and the Ironwood House (CO941) have been demolished. The McCormick home site structures, (CO1033, CO1086, CO1085), are in poor condition, but they have not yet been formally evaluated.

The McCormick structures need to be evaluated and documented. This will determine if demolition is appropriate.

Level of significance: The historic structures in the park have not been evaluated.

General management measures: The McCormick sites CO1033, CO1086, CO1085 are in poor condition. They need to be documented and evaluated for possible demolition or stabilization.

Collections

Desired future condition: All historic, natural history and archaeological objects within the park that represent Florida's cultural periods, significant historic events or persons, or natural history specimens are preserved in good condition in perpetuity, protected from physical threats and interpreted to the public.

Description: Ichetucknee currently has a number of museum objects, archeological artifacts, and archival materials in both formal and informal collections. The formal collection is housed within the park's Education and Exhibit Center located at the south entrance. This building contains approximately 16,000 cu feet of displays

designed to educate visitors about Ichetucknee's history, wildlife, ecosystems, and water conservation. The Center includes a wall-mounted timeline of the park's heritage dating from the late 1700s to 2001, with a small display of Indian beads, pottery shards, points and Spanish colonial artifacts. Additional collection items associated with the Spanish colonial period at the park are housed at the University of Florida Museum of Natural History and the Florida Department of State Division of Historical Resources. A walk-through, underwater cave replica displays fossils, animal skulls, and bones found within the Ichetucknee River. Above the cave is a simulated wetland ecosystem with mounted fauna and flora commonly found in the park. Scattered throughout the Center are incidental natural and manmade objects that were found on the property, such as turtle shells, snakeskins, deer antlers, turpentine pots, and a yellow jacket nest. The Center also displays a Timucuan dugout canoe discovered at nearby Lake Montgomery in Lake City, Florida.

The informal collections are stored in multiple offices and outbuildings of the park. One such collection includes artifacts recovered from the Headspring restoration project such as cans, bottles, bullet slugs, phosphate mining tools and coins. These have been retained in the park with the permission of DHR. A second collection of natural history objects is used in interpretive programs for the park (skulls, turtle shells, snakeskins and a longleaf pine cross-section disk). Archived items include historic photographs dating from the 1950s; newspaper articles; and a collection of anecdotes, photographs, and interviews obtained during the park's annual Old Timers Day event, which celebrates people who visited the Ichetucknee River area before it became a state park.

Condition assessment: The condition of the collections is good. Collections are stored in the park's Education and Exhibit Center and in park offices.

Level of significance: The significance of the collections has not been evaluated.

General management measures: Currently, the park has no organized collections management program. A Scope of Collections Statement needs to be developed and a collections management assessment needs to be completed, as well an inventory or catalog. A house keeping manual and a record keeping system need to be developed. Climate, humidity and pest control measures need to be evaluated for their adequacy in conserving collection objects. Recommendations for subsequent monitoring activities need to be made in order to assure appropriate conservation of collections.

Detailed management goals, objectives, and actions for the management of cultural resources in this park are discussed in the Cultural Resource Management Program section of this component. Table 7 contains the name, reference number, culture or period, and brief description of all the cultural sites within the park that are listed in the Florida Master Site File. The table also summarizes each site's level of significance, existing condition and recommended management treatment. An explanation of the codes is provided following the table.

Table 7. Cultural Sites Listed in the Florida Master Site File					
Site Name and FMSF #	**Culture/Period**	**Description**	**Significance**	**Condition**	**Treatment**
Fig Springs - San Martín de Timucua 8CO1	Deptford, Spanish, Spanish-First Period, Suwannee Valley and Leon-Jefferson	Archaeological site	NR	F	P
8CO2	Prehistoric Aboriginal	Archaeological site	NE	G	P
8CO3	Prehistoric Aboriginal	Archaeological site	NE	G	P
Little Spring and Run 8CO4	Prehistoric Aboriginal	Archaeological site	NE	G	P
8CO5	Leon-Jefferson	Archaeological site	NE	G	P
Old Mill Pond 8CO8	Historic, Leon-Jefferson, Spanish (17th century)	Archaeological site	NE	G	P
Old Mill Landing 8CO9	Prehistoric Aboriginal	Archaeological site	NE	G	P
Lowe's Field 8CO10	Prehistoric Aboriginal	Archaeological site	NE	G	P
New Ichetucknee River/Dampier's Landing 8CO15	Prehistoric Aboriginal	Archaeological site	NE	G	P
Columbia City 8CO24	Unspecified	Archaeological site	NE	G	P
Ichetucknee Railroad Crossing 8CO25	Possible Paleoindian	Archaeological site	NE	G	P
Sink of Rose Creek 8CO33	Twentieth Century American, 1900-present; Archaic, 8500 B.C. – 1000 B.C.; Prehistoric; Unknown	Archaeological site	NS	G	P
Old Fort White Landing 8CO36	Prehistoric Aboriginal	Archaeological site	NE	G	P

Table 7. Cultural Sites Listed in the Florida Master Site File					
Site Name and FMSF #	**Culture/Period**	**Description**	**Significance**	**Condition**	**Treatment**
Midpoint Mound 8CO43	Weeden Island	Archaeological site	NE	G	P
Ichetucknee River Archeological Zone 8CO49	Resource Group Pre-historic unspecified, First Spanish, Early 1600-1699, American 1821 to present	Resource Group, Archaeological District	NE	G	P
Bellamy Road, Old Spanish Trail, Old Indian Trail 8CO57	Unspecified	Linear Resource Group	NE	G	P
Simpson's Flats 8CO173	Unspecified	Archaeological site	NE	G	P
Simpson's Camp 8CO174	Unspecified	Archaeological site	NE	G	P
Mill Pond South 8CO408	Lamar, Weeden Island II	Archaeological site	NR	G	P
Midpoint Sandhill 8CO934	Prehistoric	Archaeological site	NE	G	P
Olive jar Fragment Wesley Jones 8CO935	Spanish-First or Second	Archaeological site	NE	G	P
Ironwood House USFS05-20sc 8CO941	Historic c1950	Historic Structure	NS	G	P
ISSP Scatter 8CO942	Prehistoric	Archaeological site	NS	G	P
Substation CO1015	Deptford 700B.B.-300 B.C.	Archaeological site	NS	G	P
Cedar Head Run Moonshine Still CO1022	Historic 20th century	Archaeological site	NE	G	P
Abandoned stolen safe CO1023	Historic 20th century	Archaeological site	NE	G	P
Cedar Head Spring Impoundment CO1024	Historic 20th century	Archaeological site	NE	G	P

Table 7. Cultural Sites Listed in the Florida Master Site File					
Site Name and FMSF #	**Culture/Period**	**Description**	**Significance**	**Condition**	**Treatment**
Zone 4A Phosphate Pit Complex CO1025	Historic 20th century	Archaeological site	NE	G	P
Zone 4B Clay-settling Pond Remains CO1026	Historic 20th century	Archaeological site	NE	G	P
Zone 4E Phosphate pit CO1027	Historic 20th century	Archaeological site	NE	G	P
Zone 4 B Phosphate Pit CO1028	Historic 20th century	Archaeological site	NE	G	P
Zone 1 D Phosphate Pit CO1029	Historic 20th century	Archaeological site	NE	G	P
East Main Phosphate Narrow Gauge Tram Bed CO1030	Historic 20th century	Archaeological site	NE	G	P
Trestle Point Narrow Gauge Tram Bed/Logging Road CO1031	Historic 20th century	Archaeological site	NE	G	P
Old Ferry Landings East and West CO1032	Historic 20th century	Archaeological site	NE	G	P
McCormick Life Estate Structures CO1033	Historic 20th century	Historic Structure	NE	P	ST
Former DOT Wayside Park CO1034	Historic 20th century	Historic Structure	NE	P	R
McCormick Tobacco Barn CO1086	Historic 20th century	Historic Structure	NE	P	ST
McCormick Pole Barn CO1085	Historic 20th century	Historic Structure	NE	P	ST
Ichetucknee River 8SU5	Weeden Island (?)	Archaeological site	NE	G	P
8SU16	Prehistoric Aboriginal	Archaeological site	NE	G	P
8SU17	Prehistoric Aboriginal	Archaeological site	NE	G	P
8SU18	Prehistoric Aboriginal	Archaeological site	NE	G	P

Table 7. Cultural Sites Listed in the Florida Master Site File					
Site Name and FMSF #	**Culture/Period**	**Description**	**Significance**	**Condition**	**Treatment**
Devil's Eye Spring Ichetucknee River 8SU26	Unspecified	Archaeological site	NE	G	P
Ichetucknee Springs 8SU28	Prehistoric Aboriginal	Archaeological site	NS	P	P
Power Line Crossing 8SU249	Paleoindian, Early Archaic	Archaeological site	NE	F	P
8SU251	Prehistoric Aboriginal	Archaeological site	NS	G	P
Ichetucknee 2 8SU310	19th & 20th Century American; late Archaic, Middle Archaic, prehistoric	Archaeological site	NE	F	P
Ichetucknee River Archeological Zone - Suwannee County 8SU345	Resource Group Pre-historic unspecified, First Spanish, Early 1600-1699, American 1821 to present	Resource Group, Archaeological District	NE	G	P
Robert's Bolen 8SU366	Early Archaic	Archaeological site	NE	G	P
Zone 2C Old Home Site SU384	Historic 20th century	Archaeological site	NE	G	P
Old Restaurant, Bar, Dock SU385	Historic 20th century	Archaeological site	NE	G	P
Zone 2B Phosphate Pit South SU386	Historic 20th century	Archaeological site	NE	G	P
Zone 2B Phosphate Pit North Complex: Pit and Dragline Bucket SU387	Historic 20th century	Archaeological site	NE	G	P
Zone 2H Phosphate Pit Complex: Headquarters Pit and Tram Beds SU388	Historic 20th century	Archaeological site	NE	G	P
Zone 2G Phosphate Pit Complex SU389	Historic 20th century	Archaeological site	NE	G	P

Table 7. Cultural Sites Listed in the Florida Master Site File					
Site Name and FMSF #	**Culture/Period**	**Description**	**Significance**	**Condition**	**Treatment**
Barr Refuse Pit Complex, North and SouthSU390	Historic 20th century	Archaeological site	NE	G	P
Trestle Point Narrow Gauge Tram Bed/Logging Road SU391	Historic 20th century	Archaeological site	NE	G	P
Old Ferry Landings East and West SU392	Historic 20th century	Archaeological site	NE	G	P

Significance:
NRL = National Register Listed
NR = National Register Eligible
NE = Not Evaluated
NS = Not Significant

Condition:
G = Good
F = Fair
P = Poor

Recommended Treatment:
RS = Restoration
RH = Rehabilitation
ST = Stabilization
P = Preservation
R = Removal

RESOURCE MANAGEMENT PROGRAM

Management Goals, Objectives and Actions

Measurable objectives and actions have been identified for each of the DRP's management goals for Ichetucknee Springs State Park. Please refer to the Implementation Schedule and Cost Estimates in the Implementation Component of this plan for a consolidated spreadsheet of the recommended actions, measures of progress, target year for completion and estimated costs to fulfill the management goals and objectives of this park.

While the Division of Recreation and Parks utilizes the 10-year management plan to serve as the basic statement of policy and future direction for each park, a number of annual work plans provide more specific guidance for DRP staff to accomplish many of the resource management goals and objectives of the park. Where such detailed planning is appropriate to the character and scale of the park's natural resources, annual work plans are developed for prescribed fire management, exotic plant management and imperiled species management. Annual or longer- term work plans are developed for natural community restoration and hydrological restoration. The work plans provide the DRP with crucial flexibility in its efforts to generate and implement adaptive resource management practices in the state park system.

The work plans are reviewed and updated annually. Through this process, the DRP's resource management strategies are systematically evaluated to determine their effectiveness. The process and the information collected is used to refine techniques, methodologies and strategies, and ensures that each park's prescribed management actions are monitored and reported as required by Chapters 253.034 and 259.037, Florida Statutes.

The goals, objectives, and actions identified in this management plan will serve as the basis for developing annual work plans for the park. Since the plan is based on conditions that exist at the time the plan is developed, the annual work plans will provide the flexibility needed to adapt to future conditions as they change during the 10-year management planning cycle. As the park's annual work plans are implemented through the 10-year cycle, it may become necessary to adjust the management plan's priority schedules and cost estimates to reflect these changing conditions.

Natural Resource Management

Hydrological Management

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

The natural hydrology of most state parks has been impaired prior to acquisition to one degree or another. Florida's native habitats are precisely adapted to natural drainage patterns and seasonal water level fluctuations, and variations in these factors frequently determine the types of natural communities that occur on a particular site. Even minor changes to natural hydrology can result in the loss of plant and animal species from a landscape. Restoring state park lands to original natural conditions often depends on returning natural hydrological processes and conditions to the park. This is done primarily by filling or plugging ditches, removing obstructions to surface water "sheet flow," installing culverts or low-water crossings on roads, and installing water control structures to manage water levels. Following are hydrological management objectives and actions recommended for Ichetucknee Springs State Park.

Objective: Conduct/obtain an assessment of the park's hydrological restoration needs.

A first magnitude spring-run stream and its associated floodplain natural communities are the most prominent hydrological features of Ichetucknee Springs State Park. Other features include sinkhole lakes and subterranean conduits found in the Saylor, McCormick, and Rose Sink parcels within the Ichetucknee Trace. Extensive research and monitoring efforts by the SRWMD, FDEP, USGS, and FWC, especially since the year 2000, have already produced an abundance of information documenting the relatively sudden decline in hydrological health of the Ichetucknee system (see details in the Hydrology section above). If attempts by managing agencies to restore the Ichetucknee River to its former pristine condition are to be successful, this exchange of scientific information must continue unabated.

Continued close cooperation between the DRP and other agencies, as well as independent researchers, engaged in hydrological research and monitoring programs within the springshed of Ichetucknee Springs, will encourage and facilitate additional research within the region. Management recommendations derived from the Ichetucknee research will be essential to the decision-making process that will inevitably precede implementation of plans to restore the health of this regionally important springshed.

Among the specific hydrological assessments needed are water quality monitoring in the Ichetucknee River and the tracking of water quality changes within the Ichetucknee springshed. Based on indications of deteriorating groundwater quality and increased nutrient loading within the Ichetucknee springshed, the Ichetucknee River is currently listed as a verified impaired water body for nutrients and dissolved oxygen (see details in the Hydrology section above). The Ichetucknee River (as part of the Santa Fe River Watershed) currently has a Basin Management

Action Plan (BMAP). District and park staffs will continue to participate in the BMAP process and work with FDEP regulatory personnel to seek the best available options for reducing the Total Maximum Daily Load in the Ichetucknee system.

Nuisance periphyton abundance at each of the major springs in the Ichetucknee has increased significantly over the past 10 to 15 years because of elevated nitrogen and phosphorus levels. Semiannual periphyton assessments at each of the park's eight major springs are needed to track this disturbing trend. The park has informally monitored periphyton levels in the eight major springs since the onset of aquatic vegetation die-offs in the year 2000. Currently, standardized formal assessments of periphyton levels in the Ichetucknee are not conducted. DRP will encourage researchers to resume use of the Rapid Periphyton Assessment Method at Ichetucknee Springs, which is the preferred method despite its labor intensive procedures. As a supplement, the DRP will develop and implement its own plan for monitoring periphyton semiannually. This plan will include the establishment of photo points at each of the eight major springs along the Ichetucknee River.

In 2005, as mentioned previously in the Hydrology section, the DRP learned that a septic system within the park was potentially contributing to deteriorating water quality in three major springs along the Ichetucknee. Discovery of this problem would not have occurred without information obtained from a dye trace study funded through the FDEP Springs Initiative Program. Since inappropriately designed or located facilities may negatively affect water quality in the Ichetucknee River system, park staff will periodically assess the effectiveness of septic systems associated with visitor restrooms, park residences and other facilities.

Maintenance of an ecologically viable and reliable quantity of groundwater within the Ichetucknee springshed is of critical concern to the DRP. Relative to this, among the monitoring efforts that need to continue undiminished are water quantity assessments in the Ichetucknee River and the tracking of depletion of groundwater resources in the Ichetucknee springshed. Evidence now exists that groundwater levels have fallen over the period of record in the Ichetucknee River area, as well as in other regions of north Florida, because of increased withdrawals for consumptive use (as was discussed in the Hydrology section). It is unclear what harm the Ichetucknee may have already experienced because of reduced spring flows that are attributable to this lowering of groundwater levels in the springshed.

Since the SRWMD is charged with establishing MFLs and conducting follow-up vulnerability assessments for the Ichetucknee River and all priority springs, it will be important for the DRP to work with this agency to help promote the highest level of spring flow protection for this system. The DRP should exercise due diligence in reviewing annual MFL assessments and should encourage the SRWMD to protect the Ichetucknee River, springs and associated floodplain from harm by restoring historic groundwater flows through the adopted MFL process. In addition, DRP staff will encourage water managers to consider back flooding from the Santa Fe River as an important contributor to the hydrological function of the Ichetucknee. The DRP should encourage all Ichetucknee stakeholders, including FDEP water managers, to become actively involved in restoration of historic conditions in the Ichetucknee River and springs.

Objective: Restore natural hydrological conditions and functions to approximately 10 acres of spring-run stream natural community.

As discussed previously in the Hydrology section, at least three anthropogenic factors are adversely affecting the 26-acre spring-run stream within Ichetucknee Springs State Park, especially the upper stretch of the river from the Headspring down to Mill Pond Spring: (1) Higher nutrient levels are stimulating an increase in periphyton growth, (2) decreased groundwater discharge is causing a reduction in spring flow, and (3) recreational pressures may now be too great for portions of the spring run and its adjacent floodplain. Three of the largest springs in the Ichetucknee system are experiencing nutrient increases and groundwater flow reductions. At this time, it is unknown if these changes are permanent in nature, but they have been occurring for over 15 years. True restoration of natural hydrological conditions and functions in the Ichetucknee will happen only when there is some mitigation of the three negative factors mentioned above. The Division of Recreation and Parks will consider all management options that hold some promise of reversing the decline in health of the Ichetucknee system. It may be easier to address internal sources of impacts than outside sources. Following are hydrological restoration actions recommended for Ichetucknee Springs State Park.

Continue to coordinate closely with all agencies, including SRWMD, FDEP, USGS, and FWC, that are involved in the protection and improvement of hydrological resources within the Ichetucknee springshed, particularly those at Ichetucknee Springs State Park. Coordination may consist of regular attendance at meetings concerned with regional or local hydrology, and the maintenance of relevant correspondence. Coordination with county governments will also be essential. Park staff will continue to review county land use changes proposed for properties outside the park, particularly in the Ichetucknee Trace area, looking for potential impacts to Ichetucknee water quality and quantity. Staff will provide comments to public officials if any threats to Ichetucknee River surface or groundwater resources become apparent.

Continue to work closely with FDEP and SRWMD personnel in seeking ways to mitigate increased nutrient levels in the Ichetucknee. A major part in this process will be implementation of the regional Basin Action Management Plan developed in response to USEPA-issued TMDL standards for area water bodies.

Work closely with the SRWMD to ensure that the adopted MFLs developed for the Ichetucknee are conscientiously tracked and that spring flows do not decrease to the point that the Ichetucknee system suffers significant harm. Address any water quantity issues that have caused degradation of the Ichetucknee spring-run community.

Pursue outreach opportunities to educate the public about anthropogenic impacts to the Ichetucknee system, impacts that are extensive and attributable both to outside sources and to within-park sources. The DRP will need strong public support if it hopes to be effective in reducing the threat level of these impacts.

Adjust the type and intensity of recreational use on portions of the Ichetucknee River and its springs. As discussed in the Additional Considerations section later in this plan, the park will need to consider methods of relieving tubing/swimming pressure on the uppermost, shallower stretches of the river.

To understand potential changes in spring ecosystem health, the DRP should seek funding and consider implementation of a long-term submerged aquatic vegetation monitoring program on the Ichetucknee River, perhaps similar to the successful 5-year recurring project conducted at Rainbow River.

Continue to respond aggressively to water quality impacts known to stem from the location or design of park facilities, and mitigate those impacts using the best available options for remediation.

Continue to seek funding for additional dye trace studies, especially for locations where groundwater sources are unknown, such as Coffee Spring. Dye trace studies in the Ichetucknee springshed have provided park management with invaluable information about the various sources of the springs and the timing of surface to groundwater interactions that potentially affect the Ichetucknee River.

Within the next ten years, examine the feasibility of conducting experimental plantings of key species of submerged aquatic vegetation at sites devastated by the post-2000 die-offs, such as the Devil's Eye Spring Run.

Implement effective erosion control measures that will help protect water quality in all the surface waters of the park. Park staff will identify unauthorized trails that breach the floodplain wetlands, riverbanks and spring edges, and will eliminate visitor access to those trails. Management will comply with best management practices to maintain the existing water quality on site and will take appropriate action to prevent soil erosion or other impacts to water resources.

Objective: Evaluate impacts of visitor use on the Ichetucknee River system and mitigate as needed.

Over the years of its management of Ichetucknee Springs State Park, the Florida Park Service has largely succeeded in balancing the twin demands of recreation on the river and preservation of its resources. One of the most effective means of achieving that balance has been the use of research-based carrying capacities for various sections of the river, with the intent of directing most of the intense recreational pressures to the parts of the river that are less sensitive. There is ample evidence however, that swimming and tubing activities continue to cause negative impacts to the springs and spring runs, particularly in the upper reaches of the river. Although much of the submerged aquatic vegetation that is trampled or uprooted during summer months seems to regenerate reasonably well during the off-season, aquatic plant beds located in shallow water areas do not fare as well. Their lack of complete recovery during the periods of little or no tubing may lead to a long-term decline in ecosystem health. One result may be a decrease in macrophyte species diversity in portions of the river, with some species

disappearing completely. In fact, river monitoring has provided evidence that this has already occurred along the upper Ichetucknee. Another result of intense tubing activity in shallower parts of the river is an increase in turbidity and water clarity downstream becomes noticeably impaired.

As mentioned previously in the Hydrology and Additional Considerations sections of this plan, park staff in 1989 initiated a semiannual monitoring program to assess aquatic vegetation at multiple transects established along the Ichetucknee River. That monitoring program has proven invaluable in enabling park management to document changes in aquatic plant cover over the long term and to correlate vegetation changes with the amount of visitor use, as well as with fluctuations in water levels. Information obtained from the monitoring has also served as the basis for establishing specific carrying capacities for various sections of the river. Following are specific actions recommended to achieve this objective.

Continue to closely track human impacts on the entire river by monitoring aquatic vegetation transects each spring and fall to determine long-term impacts of visitor use and to detect any impairment of water quality in the Ichetucknee River.

Continue to maintain annual photo points at sensitive locations along the Ichetucknee where the intensity of visitor use may be causing undesirable impacts. These photo points may be useful in tracking long and short-term changes in the percent cover of aquatic vegetation along the river bottom. They may also provide information about changes in spring-run water clarity caused by erosion and suspension of sediments.

Reallocate carrying capacities on the river, with special emphasis on the protection of the upper section (above Mill Pond Spring). Seek funding for ongoing turbidity measurements at relevant sites on the river to improve our understanding of the relationship between intensity of visitor use, turbidity, and the overall health of the spring run.

Natural Communities Management

Goal: Restore and maintain the natural communities/habitats of the park.

As discussed above, the DRP practices natural systems management. In most cases, this entails returning fire to its natural role in fire-dependent natural communities. Other methods to implement this goal include large scale restoration projects as well as smaller scale natural communities improvements. Following are the natural community management objectives and actions recommended for the state park.

Prescribed Fire Management

Prescribed fire is used to mimic natural lightning-set fires, which are one of the primary natural forces that shaped Florida's ecosystem. Prescribed burning increases the abundance and health of many wildlife species. A large number of Florida's imperiled species of plants and animals are dependent on periodic fire for

their continued existence. Fire-dependent natural communities gradually accumulate flammable vegetation; therefore, prescribed fire reduces wildfire hazards by reducing these wild land fuels.

All prescribed burns in the Florida state park system are conducted with authorization from the Department of Agriculture and Consumer Services, Florida Forest Service (FFS). Wildfire suppression activities in the park are coordinated with the FFS.

Objective: Within 10 years, have 1460 acres of the park maintained within the optimum fire return interval.

Prescribed burning at Ichetucknee Springs began in 1973, shortly after state acquisition of the property. Before that time, the previous owners had suppressed all fires for over 50 years. An aggressive burn program has reversed much of the damage to the sandhills. Restoration of the upland pine and upland mixed woodland will require mechanical and chemical removal of offsite hardwood species before prescribed fires will be effective in restoring degraded areas.

The park is divided into multiple burn zones or management zones (see Management Zones Map); however, some of these zones are further subdivided, with higher quality areas receiving maintenance burns in the growing season, and lower quality areas receiving restoration burns during the early growing season or late winter. Soft firebreaks that minimize or eliminate soil disturbance are used to subdivide zones in most cases. Additional resource management zones will be designated in the McCormick and Saylor Sink parcels within the Ichetucknee Trace when perimeter and internal firebreaks are constructed to subdivide the existing management zones into smaller units.

Most permanent firebreaks within the sandhills are service roads or paved roads. Closer to the river in the upland mixed woodland, some natural firebreaks are used and prescribed fires are allowed to naturally penetrate overgrown areas. As upland mixed woodland areas are restored these fires will penetrate further and further towards the floodplain and river as they once did. There is clear evidence from living relict longleaf pines and lightered pine stumps that the upland mixed woodland once stretched to the edge of the Ichetucknee River in some locations, and at least to the floodplain in others. One of the primary goals of the prescribed fire program at Ichetucknee Springs is the restoration of that upland mixed woodland. Previous restoration efforts included girdling and herbiciding of offsite hardwood species in the upland pine and upland mixed woodland. It is critical that hardwood treatments be followed by prescribed fires. Isolated stands of remnant longleaf pines within the upland mixed woodland and upland pine will be targeted for offsite hardwood removal and burning. During or just after prescribed fires, efforts will be made to introduce fire into remote longleaf stands where perimeter ignitions did not penetrate far enough into the management zone to burn isolated longleaf stands. Having sufficient soil and duff moisture is an important consideration when introducing fire into long-unburned longleaf pine stands. Burning under conditions with low soil moisture and a high drought index can lead

to significant mortality of adult pines. Prescribed fires should be used to gradually remove accumulated duff layers over a period of several years rather than during a single fire event.

In general, fire-return intervals should be more frequent than originally suggested by FNAI in the Guide to Florida Natural Communities (FNAI 1990). Rather than 2 to 5 years for sandhill, the fire return intervals should be closer to the shorter end of the range to more effectively maintain this pyrogenic community as suggested in the most recent FNAI natural community description for sandhill (FNAI 2010). It is recommended that the sandhills be burned at least every three years. The upland mixed woodland should be burned every 2-5 years along with the upland pine that separates it from the sandhills. Although the growing season or lightning season is the preferred time to conduct prescribed fires, dormant season burns may be used effectively during the restoration phases and allow an increase in the number of fires by lengthening the prescribed fire season. Dormant season fires conducted during periods of lower relative humidity are more effective at penetrating overgrown upland mixed woodlands than growing season fires at higher relative humidity.

Some of the more disrupted areas of upland pine and sandhill on the Ichetucknee Trace parcels may require significant mechanical or chemical control of hardwoods before an effective fire program can be initiated. Some of the more overgrown areas of upland pine and upland mixed woodland in the main park will also require additional management efforts before prescribed fires will be effective.

Staff will also monitor any future restrictions on prescribed burning in the region. Residences along the park boundary will be contacted before conducting adjacent prescribed burns. Public education about the benefits of prescribed fire will be promoted at the park to avoid future efforts to restrict prescribed burning of natural areas.

Many of the wildlife and plant species that occur within the park are adapted to and dependent upon a natural fire cycle. Without periodic low-intensity fires, the sandhills, upland pine, upland mixed woodland and other fire-adapted communities begin to lose plant and animal diversity. Prescribed fire is an essential tool in managing plant and animal species. Species such as the gopher tortoise, indigo snake, southeastern American kestrel and southern fox squirrel depend upon the open fire-maintained grasslands of the longleaf pine sandhills. Likewise, many rare plant species are associated with fire-maintained natural communities and depend upon periodic fires for their survival and reproduction.

Table 8 contains a list of all fire-dependent natural communities found within the park, associated acreages, optimum fire return intervals, and annual average targets for acres to be burned.

Table 8. Prescribed Fire Management		
Natural Community	**Acres**	**Optimal Fire Return Interval (Years)**
Sandhill	835	2-3
Mesic Flatwoods	4	2-3
Upland Mixed Woodland	980	2-5
Upland Pine		2-3
Floodplain Marsh	11	2-10
Dome Swamp	3	20
Pine Plantation	120	5
Annual Target Acreage	490 - 975	

The park is partitioned into burn zones, and burn prescriptions are implemented on the prescribed burn cycle for each zone. The park's burn plan is updated annually because fire management is a dynamic process. To provide adaptive responses to changing conditions, fire management requires careful planning based on annual and very specific burn objectives. Each annual burn plan is developed to support and implement the broader objectives and actions outlined in this 10-year management plan.

Based upon the fire return intervals and acreage figures for the natural communities within the park, between 490 and 975 acres will need to be burned each year to maintain the natural communities within their target fire return intervals. Not all zones may always be burned within the maximum recommended fire return intervals, while others may be burned more frequently.

To track fire management activities, the DRP maintains a statewide burn database. The database allows staff to track various aspects of each park's fire management program including individual burn zone histories and fire return intervals, staff training/ experience, backlog, if burn objectives have been met, etc. The database is also used for annual burn planning which allows the DRP to document fire management goals and objectives on an annual basis. Each quarter the database is updated and reports are produced that track progress towards meeting annual burn objectives.

Natural Communities Restoration

In some cases, the reintroduction and maintenance of natural processes is not enough to reach the natural community desired future conditions in the park, and active restoration programs are required. Restoration of altered natural communities to healthy, fully functioning natural landscapes often requires substantial efforts that include mechanical treatment of vegetation or soils and reintroduction or augmentation of native plants and animals. For the purposes of this management plan, restoration is defined as the process of assisting the recovery and natural functioning of degraded natural communities to desired future condition, including the re-establishment of biodiversity, ecological processes, vegetation structure and physical characters.

Examples that would qualify as natural communities restoration, requiring annual restoration plans include large mitigation projects, large scale hardwood removal and timbering activities, roller-chopping and other large-scale vegetative modifications. The key concept is that restoration projects will go beyond management activities routinely done as standard operating procedures such as routine mowing, the reintroduction of fire as a natural process, spot treatments of exotic plants, small scale vegetation management, and so forth.

Following are the natural community/habitat restoration and maintenance actions recommended to create the desired future conditions in the upland pine and upland mixed woodland communities at Ichetucknee Springs State Park.

Objective: Conduct habitat/natural community restoration activities on 225 acres of upland pine and upland mixed woodland natural communities.

Restoration of the upland pine and upland mixed woodland communities that border the Ichetucknee River will require a combination of management methods. The park contains nearly 1000 acres of upland pine and upland mixed woodland. In many parts of these communities, suppression of natural fires over many decades has allowed offsite hardwood species to shade out the native species. These areas have been the focus of hardwood removal efforts since the early 1990s. Effective control of offsite hardwoods will be essential to the reintroduction of fire in the more overgrown areas. Hardwood treatments will be chemical or mechanical in nature. Top priority treatment sites will be those that are adjacent to areas still in good enough condition to carry prescribed fire. The park's hardwood removal program should target a minimum of ten acres per year, on average, for a total of 100 acres over 10 years. If dedicated funding becomes available for larger restoration efforts using outside contractors, then the park may treat additional acreage.

Ongoing maintenance after removal of offsite hardwoods will focus on prescribed fire. The park has installed permanent photo points within the hardwood removal areas, similar to those typically used in management zones to monitor prescribed fire effects. As fires begin to stimulate suppressed groundcover species and further reduce offsite hardwood species, it should become easier to distinguish the upland pine from the upland mixed woodland community at Ichetucknee. Refinement of the natural communities map will probably be necessary as restoration proceeds. Due to the relative rarity of high quality upland pine and upland mixed woodland, and the imperiled species associated with them, restoration of these communities is a very high priority at Ichetucknee Springs State Park.

Park and district staffs need to assess the remnant groundcover in the 125-acre upland pine/upland mixed woodland restoration area where offsite hardwoods were previously treated. Wherever an appropriate density and diversity of groundcover is lacking, the park will initiate restoration measures using a combination of planting and direct seeding of wiregrass and other native groundcover species. The initial focus will be to provide sufficient groundcover to support prescribed fires. Wiregrass

plantings will be concentrated in those areas determined to be upland pine, since wiregrass is typically not a dominant plant in upland mixed woodland.

A more accurate mapping of the upland pine and upland mixed woodland habitats, as well as their subsequent restoration, will require additional information about the original extent of these communities. As offsite hardwoods have invaded these habitats, fire is no longer reaching many of the remaining longleaf pines. These remnant trees are valuable indicators of the original extent of these habitats. Knowledge of their location could also influence prescribed fire plans. Introduction of fire around individual remnant longleaf pines, red oaks, and mockernut hickories would expand the burnable area within the broader fire-suppressed habitat.

Natural Communities Improvement
Improvements are similar to restoration but on a smaller, less intense scale. This typically includes small-scale vegetative management activities or minor habitat manipulation. Following are the natural community/habitat improvement actions recommended at the park.

Objective: Conduct habitat/natural community improvement activities on 25 acres of sandhill community.

Due to logging activities prior to state acquisition, some sandhill areas at Ichetucknee still lack sufficient regeneration of longleaf pines. In an effort to address that situation, longleaf pine seedlings will be planted in at least 25 acres of sandhill community on the west side of the park. Chemical treatment of offsite hardwoods will be an integral part of that habitat improvement effort. Another aspect of the improvement effort will be a reduction in density of some young turkey oak and sand post oak stands that have come to dominate certain areas due to the lower than normal frequency and intensity of prescribed burns there recently. Removing a percentage of the younger onsite hardwoods along with offsite hardwood species will improve longleaf pine survivorship and recruitment and will stimulate recovery of the native groundcover.

Imperiled Species Management

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

The DRP strives to maintain healthy populations of imperiled plant and animal species primarily by implementing effective management of natural systems. Single species management is appropriate in state parks when the maintenance, recovery, or restoration of a species or population is complicated due to constraints associated with long-term restoration efforts, unnaturally high mortality, or insufficient habitat. Single species management should be compatible with the maintenance and restoration of natural processes and should not imperil other native species or seriously compromise park values.

In the preparation of this management plan, DRP staff consulted with staff of the FWC's Bureau of Imperiled Species Management or its Regional Biologist and other appropriate federal, state and local agencies for assistance in developing imperiled animal species management objectives and actions. Likewise, for imperiled plant species, DRP staff consulted with FDACS. Data collected by the FWC, USFWS, FDACS and FNAI as part of their ongoing research and monitoring programs will be reviewed by park staff periodically to inform management of decisions that may have an impact on imperiled species at the park. Management of imperiled species will be guided by Florida's Imperiled Species Management Plan (FWC 2016), and the appropriate Species Action Plans and Species Conservation Measures and Permitting Guidelines.

Ongoing inventory and monitoring of imperiled species in the state park system is necessary to meet the DRP's mission. Long-term monitoring is also essential to ensure the effectiveness of resource management programs. Monitoring efforts must be prioritized so that the data collected provides information that can be used to improve or confirm the effectiveness of management actions on conservation priorities. Monitoring intensity must at least be at a level that provides the minimum data needed to make informed decisions to meet conservation goals. Not all imperiled species require intensive monitoring efforts on a regular interval. Priority must be given to those species which can provide valuable data to guide adaptive management practices. Those species selected for specific management action and those that will provide management guidance through regular monitoring are addressed in the objectives below.

Imperiled species management at Ichetucknee Springs State Park is built on a strong monitoring program. Baseline surveys by park biologists dating back to the late 1980s have documented numerous imperiled plant and animal species. Additional surveys by academic and university-based researchers have provided valuable supplements to park species lists. Park staff was also instrumental in initiating a new National Audubon Society-sponsored Christmas Bird Count in December 2009 including Ichetucknee Springs State Park. This annual bird census will provide monitoring information on imperiled bird species. Park staff will also continue to record road kills of all imperiled species within the park and on adjacent roadways, particularly gopher tortoises, indigo snakes and southern fox squirrels.

Objective: Monitor and document seven selected imperiled animal species in the park.

Imperiled species that are part of ongoing monitoring projects include the gopher tortoise, Suwannee cooter, southeastern American kestrel, West Indian manatee, southern fox squirrel, Ichetucknee siltsnail, and several troglobitic arthropods.

<u>Gopher Tortoise</u>
In 2014, the park was systematically surveyed using Line Transect Distance Sampling techniques to develop a statistically valid estimate of the gopher tortoise population. The mark/recapture study of gopher tortoises at Ichetucknee Springs State Park has been ongoing since 1997 and has resulted in over 300 tortoises

being individually identified. This project is particularly relevant since it provides long-term survivorship data on a population that has been documented to have a high incidence of Upper Respiratory Tract Disease. The park staff will continue monitoring the gopher tortoise population for URTD. Continued cooperation with the FWC will be an important part of the management of this threatened species. Any increase in the incidence of the disease or any abnormally frequent observations of dead tortoises should be reported to the FWC Wildlife Research Laboratory in Gainesville. Public interpretation at the park will be an essential tool in curbing the practice of releasing stray tortoises into the park. Public education about the seriousness of the disease will assist in the management of the disease statewide. Staff will continue to refer to the FWC Gopher Tortoise Management Plan (FWC 2012) to guide management of this imperiled species.

Suwannee Cooter

The DRP will continue to cooperate with and assist Dr. Jerry Johnston of Santa Fe College, the North American Freshwater Turtle Research Group and the Turtle Conservancy in their surveys of freshwater turtles in the Ichetucknee River. Although the Suwannee cooter is no longer listed as an imperiled species in Florida, this long-term study provides valuable information on the status of all freshwater turtle species in the park, including the state threatened Suwannee alligator snapping turtle.

Southeastern American Kestrel

The DRP will continue monitoring the kestrel nest boxes using staff and volunteers. Park and District staff will also continue to assist FWC with the Southeastern American Kestrel Conservation Partnership (Miller 2008).

West Indian Manatee

DRP staff will continue to document the occurrence of manatees in the Ichetucknee River. Data collected include the location, number and, where possible, the sizes and distinguishing characteristics of the animals. Staff gauge readings on the river are also included in the database to look at the relationship between river stage and manatee use of the river within and below the park boundary. At certain river stages access to the park may be more difficult for manatees. Any decline in the output of the springs that feed the Ichetucknee River could potentially affect manatee access to these warm water refugia, so monitoring of river stage readings will continue to be an important component of this project. Staff will continue to refer to the FWC Manatee Management Plan (FWC 2007a) to guide management of this imperiled species. Staff will also coordinate with FWC and USFWS to implement the Florida Manatee Warm-Water Habitat Action Plan (Valade et al. 2020). Water temperatures are measured on a monthly basis at seven locations along the river and in three spring locations as part of ongoing water quality monitoring by the SRWMD and other agencies.

Southern Fox Squirrel

Although the southern fox squirrel is no longer listed as an imperiled species in Florida, it is an important component of longleaf pine communities and staff will continue to record observations of fox squirrels within the park by identifying the

location and providing a description of the color markings of each squirrel. Existing data extend back to the early 1990s and will be compiled and digitized to develop geographic information systems coverage for southern fox squirrel records in the park. When possible, photographs should be taken, and the animals should be identified using the method developed by Tye et al (2015) to classify color patterns.

Ichetucknee Siltsnail

Due to the small size and difficulty in identification of the Ichetucknee siltsnail, the park will depend upon specialists with FWC to conduct periodic sampling to estimate population levels within Coffee Spring. Coffee Spring should remain closed to visitor access to protect the Ichetucknee siltsnail. The 2004 survey noted a slight decline, perhaps due to a decline in water quality. The formal survey in 2015 found the siltsnail to be moderately abundant. Monitoring of water quality at Coffee Spring will continue as part of the larger ongoing monitoring of the Ichetucknee River and its springs. An investigation into the groundwater sources of Coffee Spring is also recommended.

Troglobitic Arthropods

Routine censuses of aquatic cave-dwelling crayfish, amphipods, and isopods are currently being conducted as part of a series of cave faunal abundance surveys by researchers at Blue Hole and Rose Creek Sink. The park staff also cooperate with other researchers monitoring or sampling aquatic cave-dwelling arthropods. Repeated censuses will document fluctuations in arthropod populations that might be correlated to flooding events or alterations in water quality.

Objective: Compile and convert imperiled species distribution and abundance data into electronic format in a geospatial database.

Tracking of imperiled species within Ichetucknee Springs State Park has been consistent since at least the 1980s and large datasets of species occurrences are compiled. These data exist as hard copy maps or electronic spreadsheets. Conversion to geographical information systems (GIS) coverage will allow more effective and efficient analysis of long-term trends and distribution patterns. DRP staff will digitize imperiled species locations and compile ancillary data. The resulting data will be incorporated into the DRP's GIS program and any records not already transmitted to the Florida Natural Areas Inventory will be shared.

Objective: Monitor and document two selected imperiled plant species in the park.

Ichetucknee Springs State Park has a well-documented flora and a number of imperiled plant species. Staff will need to map all locations of imperiled plant species recorded by Herring (1994) and other researchers near visitor use areas or where future development may occur. One species in particular, the Florida willow, has not been observed in the park since prior to 1998. Surveys in 2003 have not rediscovered this species. Staff will continue to conduct surveys for Florida willow at previously known sites to determine its status in the park.

A second imperiled species, harvest-lice, is of note since it is a component of the upland pine and upland mixed woodland communities and responds favorably to periodic fires. Tracking of this species may serve as a form of bio-indicator for the restoration efforts in the upland pine and upland mixed woodland. As the park reintroduces fire to restoration sites and shading from invasive hardwoods decreases, harvest-lice populations may show an increase. Staff should conduct surveys for blooming harvest-lice in late summer and early fall.

Exotic Species Management

Goal: Remove exotic and invasive plants and animals from the park and conduct needed maintenance control.

DRP actively removes invasive exotic species from state parks, with priority being given to those causing the most ecological damage. Removal techniques may include mechanical treatment, herbicides, or biocontrol agents.

Objective: Annually treat 10 acres of exotic plant species in the park.

DRP will develop an exotic plant removal plan that prioritizes zones and exotic species based on the ecological importance of the habitat and the aggressiveness of the invasive exotic species. The plan will include maps of infested areas by management zone and will determine priorities for treatment. The plan will provide guidance for subsequent annual work plans. The acreage of exotic plants treated per year will vary depending on the status of current infestations or of any new infestations that might arise during the life of this management plan.

A top priority for annual fall treatment is the infestation of cogongrass in zone 2H. Cogongrass should be eliminated from the park, noting that the species thrives under a fire regime and will aggressively invade sandhill and other fire type communities, replacing the native groundcover. Loss of native groundcover in these communities will deprive gopher tortoises and other species of their food source and dramatically reduce biodiversity.

Treatment of Japanese climbing fern will continue annually to ensure complete removal, and any new infestations will be promptly treated. Hand removal of water lettuce along the Ichetucknee River and floodplain will continue so that control of this species remains in maintenance state. Staff will give priority to EPPC Category I and II species when treating exotic plants in the park. At the same time, the park will practice early detection and rapid response techniques for those species that may not yet be on the EPPC Category I and II lists. This will allow park staff to respond rapidly with treatment and removal of newly detected, aggressive exotic species before they can get firmly established in the park. One species that fits this category is sweet tanglehead, which is currently moving into the park's sandhills from the mowed DOT right-of-way along U.S. Highway 27. The park will plan to treat about 10 infested acres of exotic plants every year on average, with the treatments roughly apportioned as follows: 45 gross acres in park uplands and 90 gross acres in the Ichetucknee River and associated wetlands.

Removal of non-invasive exotic plants will be promptly completed within the park as feasible; however, ornamentals that are known to be non-invasive and that occur in landscaping around residences may remain. Staff will monitor treated areas and implement follow-up treatments as needed.

***Objective: Develop and implement measures to prevent the accidental introduction or further spread of invasive exotic plants in the park*.**

DRP needs to schedule and conduct surveys and mapping of invasive exotics in every zone within the park at least twice within the next 10 years. It is important to know what exotic species are present within the park, where they are located, and how severe their infestation is. It is also very important to know what zones or communities are currently free of exotics, and to keep those areas exotics free. This is particularly important for high quality or ecologically important habitats. By regularly surveying these exotics free zones, staff can find new infestations early and eliminate them before they increase significantly in size. Areas that serve as sources of particularly aggressive species, or of species that can dramatically change ecosystem function, may need to be scouted more frequently. Finding new populations of invasive exotic plants before they become established will help prevent larger infestations. The focus should be on EPPC Category I and II species, while at the same time watching for new species that exhibit aggressive tendencies.

Preventative measures should be designed to avoid the accidental introduction or spread of exotics within the park. To prevent the introduction of invasive exotic plants by mowers, tractors, logging skidders and other equipment, park staff will need to develop and implement a protocol for equipment inspection and decontamination. The park may be able to prevent some new infestations of exotics by ensuring that contractors clean their equipment before operating in the park. The further spread of exotics already established in the park may be avoided by making sure that staff and contractors do not move equipment from a contaminated area to an exotic free area without cleaning their equipment first. This may be especially important for the exotic grass, sweet tanglehead, which currently is growing at the edge of the sandhills along the south boundary of the park, since mowing and the disking of firelines can cause it to spread.

To help prevent properties that are adjacent to the park from becoming sources of undesirable exotics, staff may need to educate neighbors about threats to the park posed by the cultivation of invasive exotics.

Objective: Implement control measures on a minimum of three nuisance and exotic animal species in the park.

Feral hogs are a recurring problem at Ichetucknee Springs State Park. Feral hog control activities will focus on areas where hogs are causing the most damage, including the Ichetucknee Spring Run, associated floodplain, and any threatened cultural resources. The park must also occasionally remove feral or stray cats and dogs from the park, which should be turned over to the county animal control facility. Adjacent homeowners will be contacted, if necessary, to discourage free roaming pets from entering the park.

Cultural Resource Management

Cultural resources are individually unique, and collectively, very challenging for the public land manager whose goal is to preserve and protect them in perpetuity. The Division of Recreation and Parks is implementing the following goals, objectives and actions, as funding becomes available, to preserve the cultural resources found in Ichetucknee Springs State Park.

Goal: Protect, preserve and maintain the cultural resources of the park.

The management of cultural resources is often complicated because these resources are irreplaceable and extremely vulnerable to disturbances. The advice of historical and archaeological experts is required in this effort. All activities related to land clearing, ground disturbing activities, major repairs or additions to historic structures listed or eligible for listing in the National Register of Historic Places and collections care must be submitted to the Florida Department of State, Division of Historical Resources (DHR) for review and comment prior to undertaking the proposed project. Recommendations may include, but are not limited to concurrence with the project as submitted, pre-testing of the project site by a certified archaeological monitor, cultural resource assessment survey by a qualified professional archaeologist, modifications to the proposed project to avoid or mitigate potential adverse effect. In addition, any demolition or substantial alteration to any historic structure or resource must be submitted to DHR for consultation and the Division of Recreation and Parks must demonstrate that there is no feasible alternative to removal and must provide a strategy for documentation or salvage of the resource. Florida law further requires that the Division of Recreation and Parks consider the reuse of historic buildings in the park in lieu of new construction and must undertake a cost comparison of new development versus rehabilitation of a building before electing to construct a new or replacement building. This comparison must be accomplished with the assistance of DHR.

Objective: Assess and evaluate 25 of 55 recorded cultural resources in the park.

There is a need for additional assessment and evaluation of archaeological sites at the park, particularly those vulnerable to flooding or feral hog impacts. There is a similar need to evaluate historic structures as well, especially those in disrepair. The reports generated will provide recommendations for needed preservation and stabilization. The following cultural resources are the highest priority for evaluation.

Site 8CO1 (Fig Springs mission) needs to be assessed and evaluated to determine if it is adequately stabilized or if it needs additional measures to protect it. This is a National Register Eligible site and it is an important point of Spanish and Native American contact. To protect it, the park formerly mowed it and, in general, tried to prevent trees from establishing there. Site 8SU310, discovered during restoration

of the Ichetucknee Headspring, should also receive further investigation. Some suggest that a geoarchaeological-based methodology could best guide the restoration project and help avoid archaeological and geological impacts.

The DRP needs to evaluate and document three historic structures, McCormick Life Estate Structures CO1033, McCormick Tobacco Barn CO1086, and McCormick Pole Barn CO1085, to determine whether they have any historic significance and whether they should be preserved, stabilized or demolished. Finally, there is an old home site in the northwest corner of zone 2C that the park staff needs to assess to find out if any physical remnants still exist.

Objective: Compile reliable documentation for all recorded historic and archaeological sites.

The park needs to ensure that all currently known sites are recorded properly in the Florida Master Site File and that site records are updated regularly, especially when new discoveries are made.

A predictive model for locating archaeological sites within the park was completed in 2012 (Collins et al 2012). Ichetucknee Springs State Park is rich in archaeological and historic resources, including prehistoric and Spanish Colonial sites. The park also has a unique ecological setting with its spring-run stream and numerous springs bordered by high quality uplands. The predictive model indicates areas of high, medium and low probability for the occurrence of pre-historic sites. The model also provides guidance for future development and will aid in selecting the best locations for future Phase 1 surveys.

There is a need for additional documentation of past mining operations in the park, especially given the extraordinary physical impact that historic phosphate mining has had on the natural and cultural landscapes of Ichetucknee. Many of the phosphate mining sites, though recently added to the FMSF, need further evaluation before changes to the sites are considered.

The park does not currently have a Scope of Collections Statement to guide the acquisition of collection items, so one needs to be developed and adopted. Collections can aid in the documentation of historic and archaeological sites.

The park should continue to gather information of historic interest during “Old Timers Day.” Verifiable information obtained from oral history interviews at this event and from other sources should be used to update the FMSF about new and currently recorded sites.

Objective: Bring 6 of 58 recorded cultural resources into good condition.

Most of the sites at Ichetucknee Springs are in good condition, but a few are in poor condition. Significant archaeological sites may be elevated to good condition by preventing erosion, minimizing disturbance from tree roots and tip ups, and preventing animal damage, especially by feral hogs. Sites that may need particular attention because of their significance or nature are 8CO1, 8SU249, and 8SU310.

The DRP needs to develop and implement a cyclical maintenance program for each cultural resource in the park. This is especially important now that feral hogs have established a population in the park. The DRP also needs to design and implement a regular monitoring program for at least six cultural sites in the park. To the extent possible, annual visits should be made to all cultural sites.

The McCormick homestead, which is now recorded in the FMSF, contains several structures that are in poor condition. The park needs to design and implement a plan to stabilize, rehabilitate, preserve, deconstruct or demolish the McCormick house, associated tobacco barn and pole barn (CO1033, CO1086, and CO1085). If the decision is to demolish the structures, some materials may be reusable if deconstruction rather than demolition techniques are used.

Special Management Considerations

Timber Management Analysis

Chapters 253 and 259, Florida Statutes, require an assessment of the feasibility of managing timber in land management plans for parcels greater than 1,000 acres if the lead agency determines that timber management is not in conflict with the primary management objectives of the land. Feasibility of harvesting timber at this park during the period covered by this plan was considered in context of the DRP's statutory responsibilities and an analysis of the park's resource needs and values. The long-term management goal for forest communities in the state park system is to maintain or re-establish old-growth characteristics to the degree practicable, with the exception of those communities specifically managed as early successional.

A Timber Assessment for the McCormick Sink Tract was prepared on May 29, 2008 (Addendum 8). The previous owners of the 150-acre parcel were the McCormick family, who had farmed portions of the property and subsequently planted slash pines on the old agricultural fields. The property contains about 75 acres of planted slash pines in two age classes. Sixty–four acres have trees that were planted in 1989, while the trees on the remaining 11 acres were planted in 1982. These stands were thinned in 2017.

Historically, this area was probably a mix of upland mixed woodland and upland pine. While past agricultural and silvicultural activities have strongly impacted the tract, there are a few areas with remnant wiregrass and other native groundcover species. There is no evidence of recent fire.

The long-term goal for this site will be to reestablish the original natural communities. The DRP will achieve this in part by replanting the area with the longleaf pine that would have historically occupied the site. In the short term, the park will manage the two stands with appropriate silvicultural techniques that may include thinning and prescribed fire. It may also be necessary to control offsite hardwood species to implement prescribed fire successfully and improve conditions for the planting of longleaf pines.

Natural community restoration efforts at the main park may include timber harvest of offsite slash pines planted by the previous owner in the 1960s. The slash pine plantations, which are located in former phosphate settling ponds, are now considered altered landcovers. Restoration of these areas to upland pine or upland mixed woodland may be impossible now due to drastic changes in the soil profiles. However, the area may be able to support upland hardwood forest species, which might be preferable to maintaining an offsite slash pine plantation.

Arthropod Control Plan

All DRP lands are designated as "environmentally sensitive and biologically highly productive" in accordance with Ch. 388 and Ch. 388.4111 Florida Statutes. If a local mosquito control district proposes a treatment plan, the DRP works with the local mosquito control district to achieve consensus. By policy of DEP since 1987, aerial adulticiding is not allowed, but larviciding and ground adulticiding (truck spraying in public use areas) is typically allowed. The DRP does not authorize new physical alterations of marshes through ditching or water control structures. Ichetucknee Springs State Park does not have an Arthropod Control Plan. Mosquito control plans temporarily may be set aside under declared threats to public or animal health, or during a Governor's Emergency Proclamation.

Additional Considerations

Visitor Use Management of the Ichetucknee River

The Ichetucknee River has long attracted people to its banks. Human use and occupation for thousands of years have altered the landscape and the river. However, within the last century, the river has seen an enormous increase in the number of people using the river for recreational reasons. A rapid increase in recreational use of the river began in the 1960s, when the Ichetucknee became more of a regional rather than just a local attraction. The former owners of the Ichetucknee property cited recurrent recreational use problems as one reason for selling the property to the state in 1970. The state essentially inherited an unmanaged recreation resource. Since that time, the DRP has strived to manage recreational uses at Ichetucknee Springs State Park to curb and reduce the impacts to natural and cultural resources. Bare sand and rock bottom often remains after heavy foot traffic occurs in the spring-run, which results in dislodging of aquatic vegetation. Remarkably, the Ichetucknee spring-run stream system has demonstrated resilience to such impacts, with patterns of base sediment accretion and vegetative regrowth. Since state acquisition of the river, impacts from years of high visitation are gradually healing. Each summer yields impacts from heavy

recreational use, but in most parts of the river, these impacts have resolved during the winter months, except when water levels are too low. Unfortunately, additional pressures within the springshed are creating new and complex challenges. The continued resilience of the spring-run stream soil and vegetation will hinge upon adjustments of carrying capacities as needed, partitioning of recreational uses on the river, and addressing other impacts observed within the Ichetucknee springshed.

In 1978, the first carrying capacity for the river was set. Initially the DRP set a capacity of 3,000 people per day, based partly on research by Charles DuToit, a graduate student at the University of Florida (DuToit 1979). A system of quarterly and yearly inspections with photopoints taken above and below the water was used to monitor changes in aquatic macrophytes. The 3000-person carrying capacity applied to the entire length of river within the park and all the tube launches were located at the north end of the park where the river is at both its narrowest and shallowest. The yielded impact to the river remained problematic, particularly in the upper reach. Accordingly, two tube launches were removed along the upper reach.

In 1982, new facilities were installed at the southern end of the park, including two new tube launches below Mill Pond Spring (Midpoint and Dampier's Landing). The carrying capacity of 3,000 people per day was split in half between the north and south entrances. The result was that 1,500 tubers per day were allowed to use the entire length of the river within the park, while an additional 1,500 used only the lower half of the river.

In an attempt to increase use of the park's new south entrance, the carrying capacity for the stretch of river below Dampier's Landing was lifted in 1983. In order to keep the Midpoint launch capacity at 1,500, the tram system stopped shuttling tubers to Midpoint once 1,500 tickets had been sold at the south entrance. Tubers were allowed to walk to Dampier's Landing and repeat the lower section.

Qualitative evaluations of photo points indicated that seasonal degradation still occurred on the lower reaches of the river, but that the aquatic vegetation could recover over the winter in many cases. However, the upper reach of the river was still suffering problematic levels of damage during the tubing season. Therefore, the DRP decided to adjust the carrying capacities again to achieve a better balance of recreation and resource preservation. In 1989, the north entrance was closed to tubing except during the summer between Memorial Day Weekend and Labor Day. In addition, a maximum of 750 tubers per day was established at the north entrance during this open period.

Also in 1989, 15 permanent vegetation transects were installed along the river to complement the qualitative photo point assessments already underway. Based on data obtained during more than 25 years of monitoring under the carrying capacities established in 1989, the percent coverage of aquatic vegetation along the stream bottom maintains a reasonably normal balance from year to year. As detailed in the Hydrology section, aquatic vegetation damaged in the summer season typically recovers over the recreationally inactive winter season. This

observed principle, however, varies from year to year based on water levels. As water levels drop, vegetation damage increases due to increased foot traffic on the river bottom. Sections of the river with higher numbers of tubers show more damage than areas with fewer tubers, and shallower reaches show more damage than deeper ones. An additional, confounding factor is that aquatic plant diversity, especially in the upper, shallower parts of the river, has decreased significantly since 1989, and, once certain species disappear from impacted areas, they do not seem to reestablish.

In 1990, the DRP closed the portion of Ichetucknee River contained within the park to motorized vessels to prevent the potential introduction of the exotic-invasive plant hydrilla (*Hydrilla verticillata*) into the Ichetucknee River, and to prevent conflicts between user groups. Restrictions on motorized vessels also protect aquatic vegetation from prop scarring.

Visitor Use and River Carrying Capacities

Daily limits on the number of recreational users, also known as carrying capacities, are currently set at 750 for the upper tube launch, and 2,250 for the Midpoint tube launch. An unlimited number of tubers may enter the river at the Dampier's Landing tube launch. These limits were established based on studies that evaluated the kinds and amounts of damage that swimming, canoeing, diving, and tubing had on the aquatic communities (DuToit 1979; MacLaren and Younker 1989). As part of an ongoing monitoring program, District and park staffs measure aquatic macrophytes in the Ichetucknee River before (spring) and after (fall) the intensive visitor use season. Initially, in 1989, fifteen permanent transects were established between the Ichetucknee Head Spring and the lower take-out point. Another transect was added in 1992, but three were lost between 1994 and 1998 due to tree falls. In 1999, four transects were added, bringing the total to 17. The current distribution of the transects is as follows: five in the river's upper section from the Ichetucknee Headspring to Midpoint; five in the middle section from Midpoint to Dampier's Landing; and seven downstream of Dampier's Landing. River carrying capacities have previously been judged adequate if vegetation coverage at the various transects remains at approximately the same level each year.

According to data collected by park staff between 1989 and 1997, visitor use did not appear to exceed the ability of the vegetation in the river to recover following each season of heavy recreational use. For the upper, middle, and lower sections, vegetation coverage ranged between 37 percent and 68 percent, depending on the location, without drastic fluctuations from year to year. Data collected between 1998 and 2008, however, have revealed trending decline, as referenced in the Hydrology section. Seasonal trends of aquatic plant damage by recreational use on the river have continued annually and are well documented. As the river transect study completes its third decade, potentially severe long-term trends are evidenced. Since 1989, aquatic vegetation transects have demonstrated a significant decline in the percent coverage of two previously dominant species: water milfoil (*Myriophyllum heterophyllum*) and muskgrass (*Chara* spp.). According to data collected in a more detailed aquatic vegetation mapping project, these two species are nearly absent in the first half of the river, while water milfoil is found in very low abundance throughout the system (Kurtz et. al. 2004). Although the direct

cause of this trend is unknown, specific factors that contribute to this decrease in aquatic macrophyte diversity are related to spring ecosystem health as discussed in the hydrology section.

DRP continues to evaluate best options for protection of this spring ecosystem. Climatic conditions may warrant adjustment to carrying capacities. For example, in 2000 Florida experienced a severe drought that resulted in decreased groundwater discharge from the springs. Gauges located at key locations along the river for monitoring river stage revealed that water levels on the Ichetucknee River had fallen to extreme lows. Acute damage to aquatic vegetation from tubing and swimming occurred during these low water conditions. Observations are that, the year after an extreme flood event, there tends to be marked reduction in emergent aquatic vegetation in the rice marsh at Grassy Flats. When this occurs, the deep channel is difficult to identify, and tubers and swimmers are often unable to remain within the deeper portions of the river. Large amounts of sediment may be released into the water column as tubers walk through shallow areas while returning to the channel.

The relatively shallow upper section of the river from the Ichetucknee Headspring to Midpoint is notably more sensitive to recreational disturbance than the much deeper lower section of the river, where the overall depth is generally greater than two meters. The lower section, however, also shows impacts, particularly along the inside edges of river bends where shallow water wading is popular.

Data collected after the 2000 unit management plan, raised concerns about incrementally reduced resilience of the submerged aquatic vegetation during the off-season. Recognizing direct impacts to the submerged aquatic vegetation, declines in species diversity, and ongoing impacts to the entire river from turbidity generated in the shallower upper river, it is recommended that the tubing in the upper river be shifted to the Midpoint Tube Launch. Access to the upper river would be still be available by canoe, kayak, and paddleboard, and swimming would continue at the Ichetucknee Headspring. Consistent with the recommendations of the DuToit study, the total number of tubers accessing the river south of Midpoint would remain at 3,000 persons daily. Impacts to the Ichetucknee Headspring from the busy swimming season, such as sand migrating back into the restored main vent, would need to be resolved during the off-season. Erosion at Blue Hole Spring will also need to be monitored.

Submerged Lands and 400-Foot Management Authority

The DRP holds a lease from the Trustees for the sovereign submerged lands of the Ichetucknee River north of U.S. Highway 27 and has management authority over the river within the park boundary. The DRP also has management authority over a 400-foot sovereign submerged lands zone from the edge of mean high water along the Ichetucknee River where it passes alongside the park south of U.S. Highway 27. Where emergent wetland vegetation exists, the zone extends waterward 400 feet beyond the vegetation. Within this zone, the park staff will enforce DRP regulations. All wildlife within this zone is protected from harvest, as stated in the Imperiled Species section above. Additionally, pre-cut timber harvesting (dead head logging) is prohibited within this zone.

Powerline Maintenance at Ichetucknee Springs State Park

Three powerline easements cross the Ichetucknee River near the South Takeout parking lot. These easements were established decades before the property became a state park. Through the combined efforts of Ichetucknee's state park biologist and Duke Energy's Senior Forester, an easement management plan has been developed that generally serves the mutual interests of both the power company and the park. The ultimate goal is to minimize the frequency and efforts of harsh treatments such as mowing and herbiciding by transforming the area into an easily maintained easement of grasses and low-growing desirable native vegetation.

Resource Management Schedule

A priority schedule for conducting all management activities that is based on the purposes for which these lands were acquired, and to enhance the resource values, is located in the Implementation Component of this management plan.

Land Management Review

Section 259.036, Florida Statutes, established land management review teams to determine whether conservation, preservation and recreation lands titled in the name of the Board of Trustees are being managed for the purposes for which they were acquired and in accordance with their approved land management plans. The managing agency shall consider the findings and recommendations of the land management review team in finalizing the required update of its management plan.

Ichetucknee Springs State Park was subject to a land management review on October 18, 2017. The review team made the following determinations:

1. The land is being managed for the purpose for which it was acquired.

2. The actual management practices, including the provision of public access, complied with the management plan for this site.

LAND USE COMPONENT

Introduction

Land use planning and park development decisions for the state park system are based on the dual responsibilities of the Florida Department of Environmental Protection (DEP), Division of Recreation and Parks (DRP). These responsibilities are to preserve representative examples of original natural Florida and its cultural resources, and to provide outdoor recreation opportunities for Florida's citizens and visitors.

The general planning and design process begins with an analysis of the natural and cultural resources of the unit, and then proceeds through the creation of a conceptual land use plan that culminates in the actual design and construction of park facilities. Input to the plan is provided by experts in environmental sciences, cultural resources, park operation and management. Additional input is received through public workshops, and through environmental and recreational-user groups. With this approach, the DRP objective is to provide quality development for resource-based recreation throughout the state with a high level of sensitivity to the natural and cultural resources at each park.

This component of the unit plan includes a brief inventory of the external conditions and the recreational potential of the unit. Existing uses, facilities, special conditions on use, and specific areas within the park that will be given special protection, are identified. The land use component then summarizes the current conceptual land use plan for the park, identifying the existing or proposed activities suited to the resource base of the park. Any new facilities needed to support the proposed activities are expressed in general terms.

External Conditions

An assessment of conditions that exist beyond the boundaries of the unit can identify any special development problems or opportunities that exist because of the unit's unique setting or environment. This also provides an opportunity to deal systematically with various planning issues such as location, regional demographics, adjacent land uses, and park interaction with other facilities.

Ichetucknee Springs State Park is located in southeastern Suwannee and southwestern Columbia counties, approximately 4 miles west of the town of Fort White. Entrance to the park is from U.S. Highway 27, to the south, and from County Road 238 to the north.

Other significant land and water resources in the vicinity include the state park facilities at O’Leno State Park, River Rise Preserve State Park, Gilchrist Blue Springs State Park, Wes Skiles Peacock Springs State Park, Fort White Mitigation Park Wildlife and Environmental Area, Poe Springs Park, and the Suwannee River Water Management District (SRWMD) 47 Bridge at the lower Santa Fe, Stuart’s Landing, and Little River Conservation Area.

Existing Use of Adjacent Lands

Adjacent land uses are mostly low-density residential, agriculture/rural designation, which allows agricultural uses and residential development up to one unit per 5 to 10 acres, and industrial, which includes active limestone mining. There are several small crop, pasture, and timber operations on agriculturally zoned parcels adjacent to the park. Adjacent residential properties are predominantly occupied by single-family and mobile homes; along with an area of multi-family residential properties on the south side of U.S. 27. Two quarries are located within close proximity to the park: one a few miles to its west, and another to its northeast. The U.S. Highway 27 200-foot right-of-way is the largest adjacent land use to the southern boundary of the park. The current Florida Department of Transportation (FDOT) five-year plan schedules no major improvements to this highway.

Planned Use of Adjacent Lands

The park consists of three separate tracts located in Suwannee and Columbia counties. Nearby population centers include Gainesville and Lake City. Gainesville is by far the largest city in the park vicinity, with approximately 125,000 residents. In 2010, approximately 605,000 people resided within 50 miles of the park boundary.

According to the data from the Florida Office of Economic and Demographic Research, Suwannee County is ranked forty-fourth out of Florida's 67 counties in total, while Columbia County is ranked fort-first. University of Florida Bureau of Economic and Business Research information indicates that the rate of population growth for both Suwannee (9.4%) and Columbia County (4.6%) has lagged behind overall growth in Florida (14.9) during the period from 2010 to 2020.

Considering this population growth, the residential area is in the initial stages of subdivision, with a preponderance of multi-acre parcel subdivisions and other low-density residential land uses. Some of the impacts to be expected include declines in local surface water quantity and quality, an increase in local traffic, point and non-point pollution sources within the Ichetucknee watershed, and continued residential development.

Review of proposed comprehensive plan amendments for each county revealed that proposed development is concentrated primarily in the northern areas, along the I-10 corridor, and around the incorporated areas of Lake City and Live Oak. There is no large-scale development or development of regional impact (DRI) planned in this area. The likelihood of area development influencing park visitation or management in the next few years is minimal.The main protection zones established by the Columbia County Land Development Regulations (LDR) regulate development in proximity to potable water wells, as well as in

areas of high natural groundwater aquifer recharge. According to the county comprehensive plan, there are no existing or planned potable water wells that would affect development within or around the park. Maps, however, of groundwater aquifer recharge areas (Columbia County, 2003) indicates that the upland area near and along the eastern park boundary could be a high recharge area.

The SRWMD Greenways 2000 Plan proposes a series of shared-use trails in the Suwannee River Basin. Near Ichetucknee Springs State Park, the Suwannee River Greenway, a shared-use trail south of U.S. Highway 27, runs from Fort White to Branford, and an additional shared-use trail is planned from Lake City to the north entrance of the park.

Property Analysis

Effective planning requires a thorough understanding of the unit's natural and cultural resources. This section describes the resource characteristics and existing uses of the property. The unit's recreation resource elements are examined to identify the opportunities and constraints they present for recreational development. Past and present uses are assessed for their effects on the property, compatibility with the site, and relation to the unit classification.

Recreational Resource Elements

This section assesses the park’s recreational resource elements, those physical qualities that, either singly or in certain combinations, can support various resource-based recreation activities. Evaluating the park landscape according to such elements provides a means for measuring its capacity to support potential recreational activities. This process also analyzes the existing spatial factors that either favor or limit the provision of each activity.

Land Area

Ichetucknee Springs State Park contains approximately 2,500 acres of natural landscape. The general topography of upland areas of the park is relatively flat. Significant elevation changes can occur within the transition zone between the park’s upland and floodplain natural communities. The upland natural communities of this park include high quality sandhill, upland hardwood forest, upland mixed woodland, and upland pine that are highly suitable for recreational activities such as hiking, and nature study. Previously disturbed upland areas are dominated by successional forest and may be appropriate for recreational development such as picnicking, interpretive facilities, and park support functions including residences, parking, and restroom facilities.

Water Area
The primary recreational resources of the park are the river and springs. The upper 3.5 miles of the Ichetucknee River is the major water body in the park. The waters of the Ichetucknee are formed by eight main springs. These, as well as numerous smaller unnamed seeps, are all located within the park boundaries. Additional wetland communities include sinkhole, sinkhole lake, dome, alluvial forest, floodplain swamp, floodplain marsh, and aquatic caves.

The river and its associated springs and aquatic caves represent a high-quality example of one of Florida's spring-run stream systems. The river and springs are attractive for water-based recreation such as canoeing, kayaking, and swimming, as well as tubing. The clear waters of the river and springs make them highly suitable for snorkeling and scuba diving. Due to the sensitive nature of this system, however, the DRP continuously works to reduce environmental impacts through implementation and refinement of recreational carrying capacities along segments of the river and encouraging swimming only at designated springs.

Natural Scenery
Clear water boils from a series of springs to create the beautiful wild river Ichetucknee River. The river winds through outstanding examples of native lowland and upland forests that support a number of endangered or threatened plant and animal species. Views from the river and at several overlooks along the river corridor are outstanding. The park's mosaic of natural community types provides for a varied visual experience along hiking trails within the western portion of the park. The park's high quality sandhill is an excellent example of this increasingly rare community type and viewsheds within this portion of the park are exceptionally scenic.

Significant Habitat
Gopher tortoise, southern fox squirrel, short-tailed snake, southeastern American kestrel, and eastern indigo snake are among the imperiled species found within the upland areas of the park. The river corridor also provides habitat for imperiled wading birds such as the little blue heron. Florida manatees now regularly visit the lower and middle stretches of the river. Opportunities for wildlife viewing are excellent. All imperiled species will be protected under established DRP management policies, and visitor activities are carefully monitored to identify potential impacts.

Natural Features
The significant natural features of the park include both hydrological and vegetative elements. The artesian springs and its associated floodplain habitat are important to the natural communities and hydrology of this area. The upland natural communities, especially sandhill, are of utmost regional importance, since the park is one of the few remaining areas in the region where this community remains. These features have been recognized since 1972 and 1980 when the park was registered as a National Natural Landmark and as a State Natural Feature Site, respectively.

Archaeological and Historic Features

As noted in the Cultural Resources section, Ichetucknee Springs State Park contains significant historical and archaeological sites. Fossil remains of prehistoric animals, numerous Indian artifacts, the remains of a gristmill and the site of a 17th century Spanish mission have been found along the river. The Florida Master Site File records the park itself as the Ichetucknee River Archaeological Zone. While many sites do not contain elements that are readily visible to the average visitor, carefully controlled visual access to some of the park's significant sites would provide opportunities for interpretation of Florida's diverse cultural history.

Assessment of Use

All legal boundaries, significant natural features, structures, facilities, roads and trails existing in the unit are delineated on the base map (see Base Map). Specific uses made of the unit are briefly described in the following sections.

Past Uses

Before acquisition by the state, phosphate mining, timbering and farming operations occurred on the property. Phosphate mining occurred in two phases. During the first phase, the phosphate boom era of the late 19th and early 20th century, phosphate extraction pits were opened on the property, and ore was transported to the neighboring communities, Fort White or High Springs, via narrow gauge rail cars on the tram roads. This period also marks a time when the park and its surrounding area were heavily logged and converted into an agricultural landscape. The second phosphate phase occurred when Loncala Phosphate, Inc. reopened the old pits, during the 1950s - 60s, and scraped them for phosphate residues. The reminders of these rather recent past are an overgrown mine pit, which has been incorporated into the nature trail near the Ichetucknee Headspring, and clefts of a former gristmill that was historically powered by Mill Springs Run, located approximately two miles downstream of the Ichetucknee Headspring.

Swimming and tubing are the traditional uses of the river and the springs. Since the early 1960s, continually increasing recreational use of the river caused considerable damage to the springs, river, and shoreline vegetation. Monitoring of visitor recreational impacts began in 1970 when the state acquired the property. Since 1990 when the current recreational carrying capacity was determined, and implemented, the Ichetucknee River has made significant recovery.

Future Land Use and Zoning

The DRP works with local governments to establish designations that provide both consistency between comprehensive plans and zoning codes and permit typical state park uses and facilities necessary for the provision of resource-based recreation.

Development on the land uses adjacent to Ichetucknee Springs State Park is generally planned to remain at the current level, with primarily agricultural and low-density residential land uses. The Columbia County and Suwannee County Future Land Use Maps (FLUM) both classify the park area as recreation. The area along the Ichetucknee River, north and south of the park boundary, is classified as environmentally sensitive area (ESA) in Columbia and ESA-2 in Suwannee. Both classifications limit development to less than or equal to 1 dwelling unit per 10 acres. With exception of those designated environmentally sensitive, the area surrounding the park is zoned as agriculture (A-1 in Suwannee, A-3 in Columbia), and limited to less than or equal to one dwelling unit per 5 acres.

Current Recreational Use and Visitor Programs

The recreational uses available at Ichetucknee Springs State Park include swimming, tubing, snorkeling, scuba diving, canoeing, picnicking, fishing, and nature study. Swimming is most popular at the Ichetucknee Headspring in the North Use Area. The North Use Area also serves as the launch point for tubing and paddling. Picnic tables and a few shelters are available in both the North and South use areas. An interpretive center is located in the South Use Area.

Traditionally, the largest recreational use of the park has been tubing. Accommodating the emphasis on tubing, and given the linear form of the park's primary natural resource, the park has maintained two distinct entrances and use areas: the north entrance and use area and the south entrance and use area. Existing recreational facilities at both use areas have been developed primarily for use during the tubing season. During most of the year, a concessionaire-operated tram system connects the Midpoint Launch and the South Takeout, with a shuttle operating between the north and south ends. At peak use hours during the summer months, parking and user access related challenges occur at the north entrance and use area.

Outside of tubing season, the park remains popular for a variety of activities including paddling, nature walking, picnicking, and general nature study. Current development at the North Use Area provides access to activities other than tubing and is utilized year-round. A paddling concession operates near the upper launch. Existing development at the South Use Area is designed to facilitate the great influx of tubers and swimmers from May through September and experiences a significant drop in utilization from October through April.

Legend

- Park Boundary
- US Highway
- County Road
- Park Road Paved
- Park Road Stabilized
- Park Road Unstabilized
- Walkways
- Hiking Trail
- Paddling Trail
- Springs
- Structures
- Parking Lots

240

47

238

27

Ichetucknee Rd.

Drew Feagle Rd

Ichetucknee Spring

Blue Hole Spring

INSET 1

INSET 2

MIDPOINT TUBE LAUNCH

SOUTH TAKEOUT

DAMPIERS LANDING

bing™

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ICHETUCKNEE SPRINGS STATE PARK

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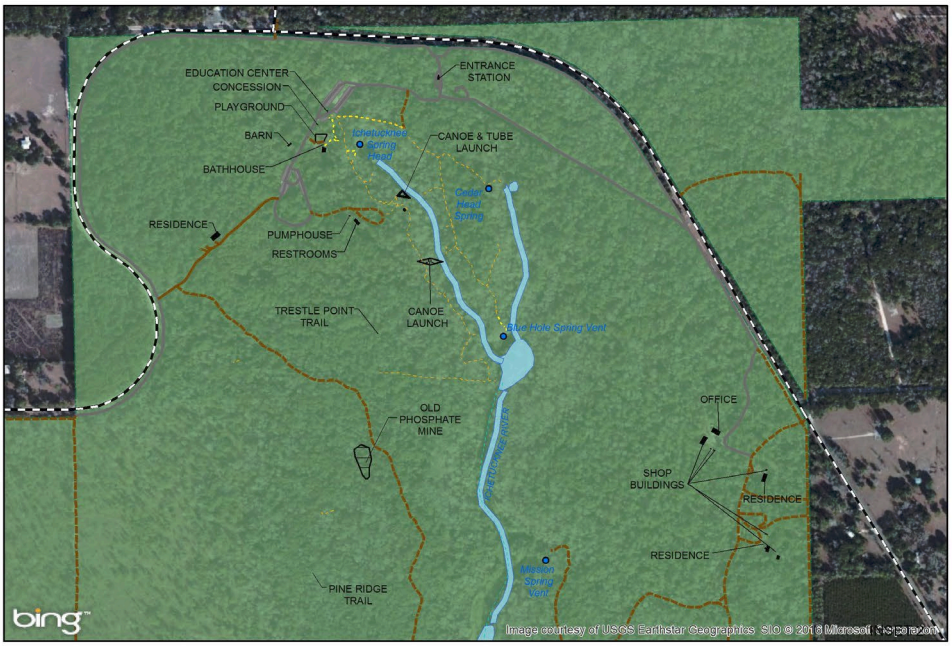
0 0.375 0.75 1.5 Miles

Florida Department of Environmental Protection
Division of Recreation and Parks
Date of aerial: 2011

BASE MAP
PAGE 1



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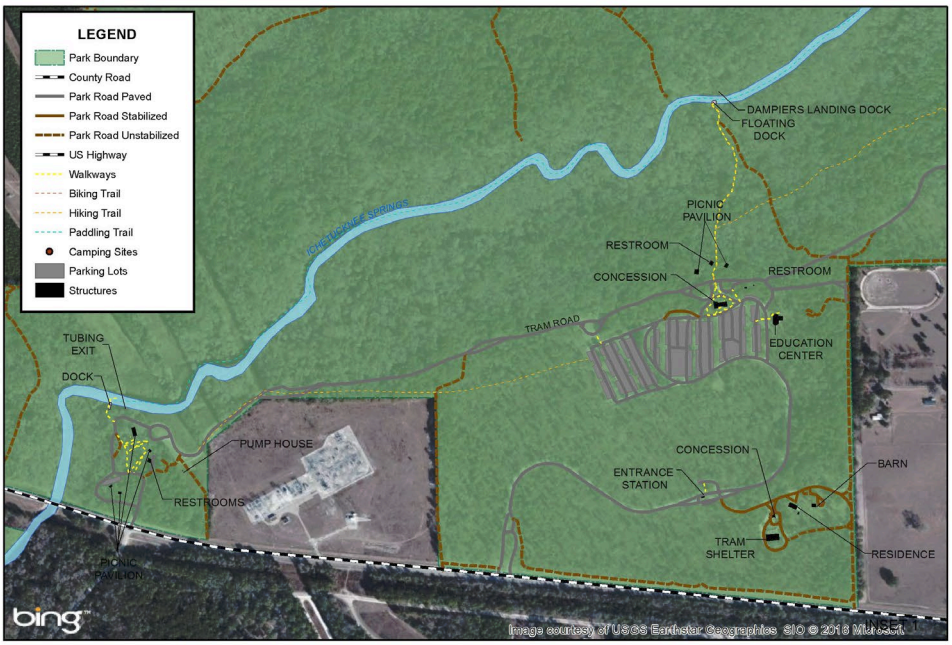

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ICHETUCKNEE SPRINGS STATE PARK

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Florida Department of Environmental Protection
Division of Recreation and Parks
Date of aerial: 2009

BASE MAP
PAGE 2

Blue Hole, located near the river headwaters in the northern portion of the park is a popular destination for cavern and cave divers. A half-mile trail leads from the North Use Area to an observation platform with access to the spring basin for divers as well as swimmers. Upland areas of the park with visual access to karst features and the river can be access along a total of three designated nature trails.

The Rose, McCormick, and Saylor sink parcels, located to the northeast of the park's primary parcels, are not accessible for public recreation. Due to the sensitive nature of the natural communities and karst features on these parcels, public access has not been developed.

Ichetucknee Springs State Park recorded 342,776 visitors in FY 2018/2019. By DRP estimates, the FY 2018/2019 visitors contributed $30,645,836 million in direct economic impact, the equivalent of adding 429 jobs to the local economy (FDEP 2019).

Other Uses
An electrical distribution substation, belonging to Duke Energy, is located midway along the park's U.S. Highway 27 frontage. From this sub-station, three power line easements cross the park in a northwesterly direction.

Protected Zones
A protected zone is an area of high sensitivity or outstanding character from which most types of development are excluded as a protective measure. Generally, facilities requiring extensive land alteration or resulting in intensive resource use, such as parking lots, camping areas, shops, or maintenance areas, are not permitted in protected zones. Facilities with minimal resource impacts, such as trails, interpretive signs and boardwalks are generally allowed. All decisions involving the use of protected zones are made on a case-by-case basis after careful site planning and analysis.

At Ichetucknee Springs State Park the springs, spring-run/river and associated floodplain, hydric and mesic communities, as well as the upland mixed woodland and sandhill that dominate the western portion of the park and several locations of sensitive plant habitat have been designated as protected zones.

Existing Infrastructure

Recreation Facilities

North Use Area
Picnic tables (3)
Grills (15)
Nature trail (0.8 mile)
Bathhouse
Tubing launch
Paddling launch
Paved parking (120 spaces)

South Use Area
Large picnic shelter (1)
Medium picnic shelters (2)
Scattered picnic tables
Grills (42)
Interpretive center
Restrooms (3)
Boardwalk/trail river access points (3)
  Midpoint
  Dampier's Landing
  South Takeout
Paved parking (400 spaces)
Concession (1)

Support Facilities

North Use Area
Wells (3)
Entrance station

South Use Area
Entrance station
Information booth
Administrative offices

North Shop
Storage sheds (2)
Pole shelter

South Shop
Storage sheds (2)
Flammable storage building (1)
Equipment shelter (1)
Ranger residences (3)
Volunteer sites (3)

Parkwide

Paved road (3.3 miles)
Service road (5 miles)

Conceptual Land Use Plan

The following narrative represents the current conceptual land use proposal for this park. The conceptual land use plan is the long-term optimal development plan for the park, based on current conditions and knowledge of the park's resources, landscape, and social setting (see Conceptual Land Use Plan). The conceptual land use plan is modified or amended, as new information becomes available regarding the park's natural and cultural resources or trends in recreational uses, in order to adapt to changing conditions. Additionally, the acquisition of new parkland may provide opportunities for alternative or expanded land uses. The DRP develops a detailed development plan for the park and a site plan for specific facilities based on this conceptual land use plan, as funding becomes available.

During the development of the conceptual land use plan, the DRP assessed the potential impact of proposed uses or development on the park resources and applied that analysis to determine the future physical plan of the park as well as the scale and character of proposed development. Potential resource impacts are also identified and assessed as part of the site planning process, once funding is available for facility development. At that stage, design elements (such as existing topography and vegetation, sewage disposal and stormwater management) and design constraints (such as imperiled species or cultural site locations) are investigated in greater detail. Municipal sewer connections, advanced wastewater treatment or best available technology systems are applied for on-site sewage disposal. Creation of impervious surfaces is minimized to the greatest extent feasible in order to limit the need for stormwater management systems, and all facilities are designed and constructed using best management practices to limit and avoid resource impacts. Federal, state and local permit and regulatory requirements are addressed during facility development. This includes the design of all new park facilities consistent with the universal access requirements of the Americans with Disabilities Act (ADA). After new facilities are constructed, park staff monitors conditions to ensure that impacts remain within acceptable levels.

Potential Uses

Public Access and Recreational Opportunities

Goal: Provide public access and recreational opportunities in the park.

The existing recreational activities and programs of this state park are appropriate to the natural and cultural resources contained in the park and should be continued. New and/or improved activities and programs are also recommended and discussed below.

Objective: Maintain the current parkwide recreational carrying capacity of 3,821 users per day, while increasing protection of the shallow upper spring run.

The growth of Florida's resident and tourist populations brings increasing pressure for more widespread access, and for denser levels of public use in the

natural areas available to the public. Consequently, one of the greatest challenges for public land managers is the balancing of reasonable levels of public access with the need to preserve and enhance the natural and cultural resources of the protected landscapes.

In order to maintain the existing levels of recreational opportunities, activities, and carrying capacities, visitor use of the shallow upper portion of the river should be reallocated to the lower portion of the river.

Objective: Expand the park's recreational carrying capacity by 264 users per day.

This plan proposes to expand and improve hiking and picnicking opportunities within Ichetucknee Springs State Park, accommodating more visitors for these activities in the upland areas of the park.

Objective: Continue to provide the current repertoire of 10 interpretive, educational and recreational programs on a regular basis.

A visitor center was constructed to introduce visitors to the natural and cultural resources of the park, offering visitors guidance about other nature- and heritage-based tourism sites available in the park and region. This facility includes meeting space, an audio-visual room for presentations, displays that orient visitor to the natural and cultural resources of the park, and an office that supports the park's educational and interpretive programs.

The Ichetucknee Springs Working Group and staff at Ichetucknee Springs State Park also initiated a number of public education programs to inform residents throughout the Ichetucknee Trace. This public outreach has highlighted important springs, creeks, and sinkholes throughout the Ichetucknee Springshed. Accomplishments include the Rose Sink information kiosk and brochure (completed in 2007), Springs Protection Area signs strategically located on highways that pass through the basin (completed in 2006), and a joint Columbia County/FDEP LIFE (Learning in Florida's Environments) program, with Fort White Middle School as the cooperating school.

Interpretation of the recently acquired Rose Sink property is provided through a kiosk located near the north boundary of the parcel along CR 240. In addition, signs delineating the boundaries of the Ichetucknee springshed are now in place along many of the area's highways, helping to educate local residents and visitors about this important watershed resource. The LIFE program is a partnership created between Ichetucknee Springs State Park and Fort White Middle School. This program has utilized the park as an outdoor classroom, focusing on educating students about water quality and its relevance to the health of the springshed.

North Use Area
Improve Walkways
Add Picnic Pavilions

New Picnic Area
Construct Large Pavilion

Extended Hiking Trail

Extended Hiking Trail

South Use Areas
Implement Master Plan
Improve Walkways
Improve Picnic Facilities
Renovate Restrooms
Add Bathhouse
Add Tram Waiting Shelter
Improve Safe Water Access

Legend

- Park Boundary
- Proposed Development
- Proposed Trail Extensions
- Existing Trails

Image courtesy of USGS Earthstar Geographics SIO © 2016 Microsoft

ICHETUCKNEE SPRINGS STATE PARK

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Florida Department of Environmental Protection
Division of Recreation and Parks
Date of aerial; 2011

CONCEPTUAL LAND USE PLAN

Objective: Develop 1 new interpretive, educational and recreational program.

Interpretive kiosks should be added to both new and existing trails, and the establishment of a clear system of trail markings is vital for resource protection, and to ensure that users have a clear spatial understanding of the trail network. Interpretive stations could inform the public about the resource management activities occurring at the park, and incorporate the larger preservation, stewardship, land use and cultural resource issues. To the extent possible, these signs should be centrally located, with the express purpose of making visitors aware of their location and the sensitivity of the resources at Ichetucknee Springs State Park. Where fencing will be installed, visitors should be informed, through interpretive signs and staff contact, of the reasons for the access restrictions.

Proposed Facilities

Capital Facilities and Infrastructure

Goal: Develop and maintain the capital facilities and infrastructure necessary to implement the recommendations of the management plan.

The existing facilities of this state park are appropriate to the natural and cultural resources contained in the park and should be maintained. New construction, as discussed further below, is recommended to improve the quality and safety of the recreational opportunities, to improve the protection of park resources, and to streamline the efficiency of park operations. The following is a summary of improved and/or new facilities needed to implement the conceptual land use plan for Ichetucknee Springs State Park.

Objective: Maintain all public and support facilities in the park.

All capital facilities, trails, and roads within the park will be kept in proper condition through the daily or regular work of park staff and/or contracted help.

Objective: Develop a master plan, improve/repair existing access facilities, construct new day use amenities, and add 1 mile of trail.

Major repair projects for park facilities may be accomplished within the ten-year term of this management plan, if funding is made available. These include the modification of existing park facilities to bring them into compliance with the Americans with Disabilities Act (a top priority for all facilities maintained by DRP). Improvements to general day use facilities, shelters, and walkways should be prioritized at both use areas over the next ten years. The following discussion of other recommended improvements and repairs is organized by use area within the park.

North Use Area

The northern day use area has historically been used as the tube launch for the upper reaches of the Ichetucknee River. With river access changes described under the River Access Management section of this plan, tube launches from the North Use Area will be discontinued, tube-specific facilities repurposed, and upper river access designated to accommodate paddlecraft only. Swimming, also a highly popular and traditional use of the North Use Area, is allowed in both the adjacent Ichetucknee Headspring and at Blue Hole. Although many visitors simply pass through the North Use Area on the way to the river access, popularity of swimming and picnicking merits facilities improvements. Currently, the existing picnic facilities consist only of scattered unsheltered picnic tables and grills located along the main access path to the tube launch. The only shelter currently available in the North Use Area is the alcove of the restrooms. This is particularly problematic during the frequent rainstorms that characterize Florida summers.

Addition of up to six small picnic shelters, containing two tables each, is needed in the vicinity of the restrooms, and swimming area. Any new development in this location must be sensitive to preserving the viewshed toward the Ichetucknee Headspring and consider unencumbered access to the river as may be needed for paddlecraft. The existing approach to the river from the parking area could be redesigned to better integrate the picnic shelters, restrooms, and pedestrian access to the river launch, especially to accommodate potentially increased volumes of paddlers portaging through this area.

To better accommodate groups exceeding eight visitors, one large picnic pavilion, sheltering eight tables is recommended. Siting of this facility should take advantage of the old restroom building. Located within proximity to the Headspring, river access, and the new proposed bathhouse – the old restroom building site is highly suitable for a new picnic pavilion. To limit additional impact to surrounding natural areas, demolition or adaptive reuse of the existing structure is recommended.

South Use Area

During much of the year, the South Use Area functions as the primary visitor activity center. Since tubing activity is not restricted by a daily cap from Dampier's Landing to the southernmost take-out, a high volume of activity is generated during the warmer months. Given the complex mix of trams, vehicles, and visitors portaging recreation and picnic supplies, current facilities are insufficient for safe and efficient shared used circulation. Additional shelters, expanded restrooms, new bathhouse, and improved walkways are needed. Safety improvements and renovations to access facilities are needed along the boardwalks and walkways to the existing tube launches at the river midpoint and Dampier's Landing.

Solutions to the multifaceted site planning issues of the South Use Area should be addressed through a new conceptual master plan for improved facilities

development from the midpoint tube launch to the southernmost take-out. The conceptual master plan would consider the expansion and improvement of picnic facilities, expansion of restroom and concession facilities, improved tram operations, visitor parking and vehicle circulation, and improved trails and walkways that encourage pedestrian movement and safety. A carefully considered master plan can remedy current problems and address the park's potential future needs. The conceptual master plan for the South Use Area is a short-term goal and should be completed prior to any potential redevelopment.

Similar conditions to the North Use Area exist at the South Use Area, where picnicking is largely accommodated by picnic tables scattered along landscape medians, three pavilions, and within the alcove in front of the concession. As with the North Use Area, expansion of picnic amenities would benefit the large number of visitors during the summer season. Separation of picnic facilities from the altered parking area setting would offer significant aesthetic improvements and maximize interpretive opportunities within a natural landscape. Picnicking in small to large groups is a popular and traditional activity at the park with high demand for the facilities currently available. Group picnicking is especially popular and, accordingly, new and improved sheltered picnic facilities are needed.

Parkwide Trails

Extensions of existing trails within the central portion of the park are proposed. Trails should be unpaved single-track nature or hiking trails, with potential to connect use areas. Attention should be given to sensitive natural community types, especially where trails may impede prescribed fire, alter hydrology, or result in erosion and downslope sedimentation. Park and district biological staff will survey and evaluate any protected zones through which new or extended trails may traverse. Estimated extent of new trail is approximately one mile.

Facilities Development

Preliminary cost estimates for these recommended facilities and improvements are provided in the Ten-Year Implementation Schedule and Cost Estimates (Table 10) located in the Implementation Component of this plan. These cost estimates are based on the most cost-effective construction standards available at this time. Preliminary estimates are provided to assist DRP in budgeting future park improvements, and may be revised as more information is collected through the planning and design processes. New facilities and improvements to existing facilities recommended by the plan include:

Recreation Facilities

North Use Area
Walkway improvements

New bathhouse
Small picnic pavilions (6)
Large picnic pavilion (1)
New and extended hiking trails
Interpretive kiosks (2)
Repurposing/Conversion of tubing launch

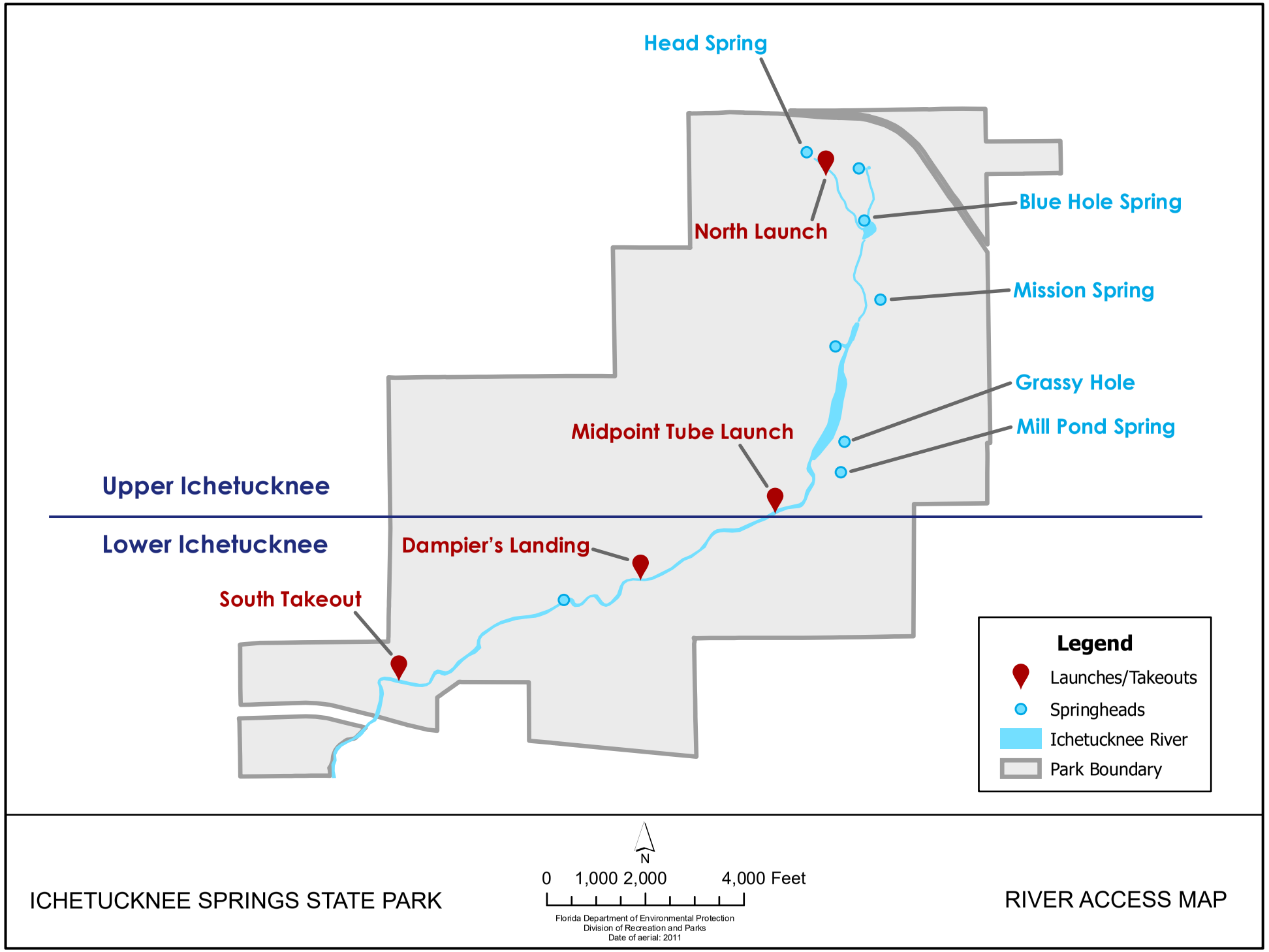
South Use Area
Walkway improvements
Landscape improvements
Medium picnic pavilions (2)

River Access Management

The ecosystem of the Ichetucknee River faces impacts from both broad watershed sources (impairing water quality and reducing water quantity) and direct tactile/erosive impacts from longstanding visitor use patterns. Solutions to water quality and quantity issues are regional and long-term, addressed largely through basin management planning efforts. Near-term solutions for improving the ecological health of the Ichetucknee River can be addressed within the park boundaries by modifying the ways visitors access and experience the river.

The DRP has long implemented interpretive and educational strategies to promote rule compliance/encourage visitors to refrain from touching the river bottom or inadvertently damaging submerged aquatic vegetation (SAV). Despite these ongoing efforts, given the cumulative effects of frequent non-compliance with river rules, unintentional impacts, and the diminishing annual recovery of SAV between summer seasons, the DRP has been evaluating the benefits of changing visitor use patterns on the Ichetucknee River for the past several years. Both past approved plans and the 2017 draft plan (which was previously submitted to ARC) have identified reducing the carrying capacity in upper sections of the river if necessary.

As of 2018/2019, based on the multiple factors that increasingly impair the health of the Ichetucknee River ecosystem and analysis of the current trends, the DRP has determined that the cumulative adverse changes necessitate a new


Head Spring
Blue Hole Spring
North Launch
Mission Spring
Grassy Hole
Midpoint Tube Launch
Mill Pond Spring
Upper Ichetucknee
Lower Ichetucknee
Dampier's Landing
South Takeout
Legend
Launches/Takeouts
Springheads
Ichetucknee River
Park Boundary
N
0 1,000 2,000 4,000 Feet
Florida Department of Environmental Protection
Division of Recreation and Parks
Date of aerial: 2011
ICHETUCKNEE SPRINGS STATE PARK
RIVER ACCESS MAP

management strategy. In 2020, the Ichetucknee River experienced a rare one-year pause in intensive recreational activity as a result of access closures required for the protection of public health during the COVID-19 pandemic. As a result of this pause in intensive recreational activity, particularly tubing on the upper river, the otherwise declining SAV rebounded in an unprecedented way. Evidence indicates that while the interval between tubing seasons is decreasingly sufficient for regeneration of the SAV, the 15-month period since the end of the 2019 tubing season has been markedly beneficial in terms of overall SAV coverage of the river bottom and species diversity. With more time absent of erosive impacts, the current recovery trend is expected to continue with a trajectory toward the river conditions observed prior to the year 2000. However – the longitudinal evidence (indications after 31 years of biannual transect studies) suggest that if recreational river usage returns to normal, this much-needed SAV recovery will be reversed and the river will recommence the pattern of severe annual SAV loss with insufficient recovery periods between seasons.

For these reasons, to protect against the overall ecological decline of the river and to take advantage of the exceptionally rare opportunity for SAV regrowth that occurred during the 2019/2020 interval, the DRP proposes to redistribute tubing from the upper river altogether and re-allocate that same number (750 tubes per day) to the Lower Ichetucknee River where the river is several feet deeper and less vulnerable to tactile/erosive visitor impacts.

According to this management strategy, the river ecosystem is expected to continue its recovery, visitors will continue to experience the scenery and serenity of the upper river via paddling (100 canoes, kayaks, or paddleboards per day), and visitors will also continue to enjoy the experience of tubing the Ichetucknee River from Midpoint down to South Takeout (3,000 tubes per day; an increase of 750). From Dampier's Landing to South Takeout, tubers are welcome to cycle through repeatedly with an unlimited carrying capacity. Dampier's Landing, which is located downstream of Midpoint) is accessed by a walking path from South Takeout.

Paddling access will be available year-round from the North Use Area and will be available up to the daily carrying capacity as paddlers arrive, on a first come, first served basis. Both personal paddlecraft and rental paddlecraft from the concessionaire will be welcome to launch. Paddlers are able to paddle the entire length of the river and will be encouraged to be mindful of wildlife, aquatic resources, and tubers sharing the river downstream of Midpoint.

Recreational Carrying Capacity

Carrying capacity is an estimate of the number of users a recreation resource or facility can accommodate and still provide a high quality recreational experience and preserve the natural values of the site. The carrying capacity of a unit is determined by identifying the land and water requirements for each recreation activity at the unit, and then applying these requirements to the unit's land and water base. Next, guidelines are applied which estimate the physical capacity of the unit's natural communities to withstand recreational uses without significant degradation. This analysis identifies a range within which the carrying capacity most appropriate to the specific activity, the activity site and the unit's classification is selected (see Table 9).

The recreational carrying capacity for this park is a preliminary estimate of the maximum number of users the unit could accommodate after the current conceptual development program has been implemented. When developed, the proposed new facilities would approximately increase the unit's carrying capacity as shown in the following table. For Ichetucknee Springs State Park, the highest rates of visitation occur seasonally on the Ichetucknee River south of Headspring and Blue Hole. The vast majority of this visitation is by tubers.

As indicated in the Resource Management Component and prior sections of the Land Use Component, carrying capacity for seasonal tubing is managed by counting a daily total. A capacity is not calculated for the number of tubers on the river at one time. Tubers entering the river at the North Launch are capped at 750 per day and may exit at Dampier’s Landing or proceed to the South Takeout. An additional 2,250 tubers are permitted to launch daily from Midpoint. Proposed changes to tubing patterns will discontinue use of the northern portion of the river and redistribute all tubing to the lower portion, consistent with the recommendations of the DuToit carrying capacity study, which has guided carrying capacity on the Ichetucknee River since 1979.

Table 9. Recreational Carrying Capacity						
	Existing Capacity*		Proposed Change to Capacity		Estimated Future Total Capacity	
Activity/Facility	One Time	Daily	One Time	Daily	One Time	Daily
Tubing*						
North-Dampier's/South		750		-750		0
Midpoint-South		2,250		750		3,000
Paddling*						
North-Dampier's/South	25	100			25	100
Spring Swimming						
Headspring	55	110			55	110
Blue Hole	35	70			35	70
Cavern/Cave Diving						
Blue Hole	5	25			5	25
Trail Use						
Hiking	20	80	10	40	30	120
Picnicking						
North Use Area	12	24	80	160	92	184
South Use Area	64	128	32	64	96	192

*Existing capacity revised from approved plan according to DRP guidelines.
*Capacity for tubing is measured only as a daily total.
*Allowance for unlimited use of lower-most river from Dampier's Landing to South Takeout is not represented in this table.
*Paddling capacity is measured by vessels.

Optimum Boundary

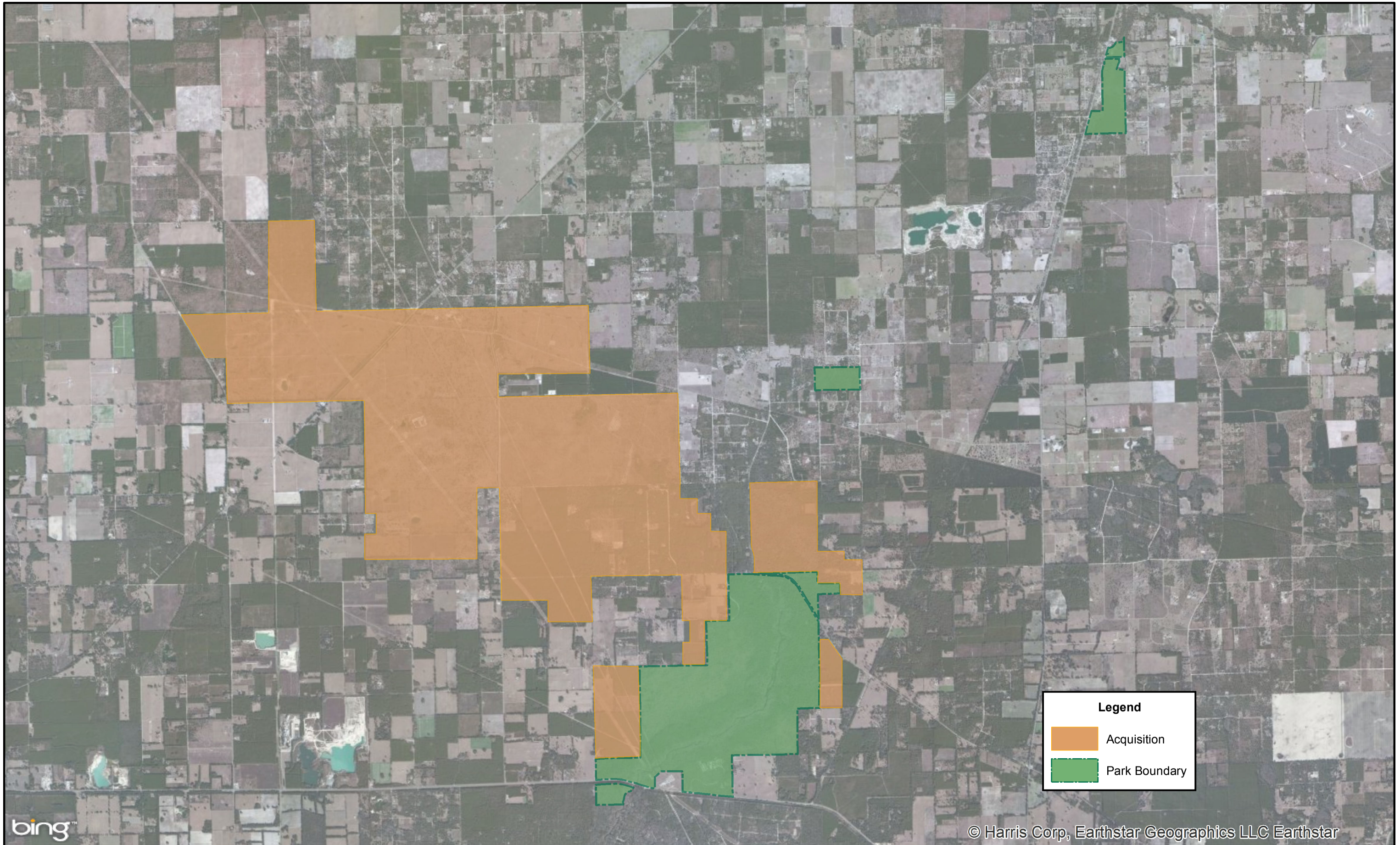
The optimum boundary map reflects lands considered desirable for direct management by the DRP as part of the state park. These parcels may include public or privately-owned land that would improve the continuity of existing parklands, provide the most efficient boundary configuration, improve access to the park, provide additional natural and cultural resource protection or allow for future expansion of recreational activities. Parklands that are potentially surplus to the management needs of DRP are also identified. As additional needs are identified through park use, development, and research, and as land use changes on adjacent property, modification of the park's optimum boundary may be necessary. Identification of parcels on the optimum boundary map is intended solely for planning purposes. It is not to be used in connection with

any regulatory purposes. Any party or governmental entity should not use a property's identification on the optimum boundary map to reduce or restrict the lawful rights of private landowners. Identification on the map does not empower or suggest that any government entity should impose additional or more restrictive environmental land use or zoning regulations. Identification should not be used as the basis for permit denial or the imposition of permit conditions.

Connectivity of the undeveloped landscape plays a significant role in sustaining the park's wildlife populations and protecting the sensitive springshed. Increasing the acreage of the park and preserving existing connections between the park and other natural areas would support the flora and fauna that make up the natural communities of the park. Establishment of new linkages with other natural areas in the Ichetucknee Springs vicinity is also an essential step in preventing the isolation of the park and a decline in species diversity.

Approximately 8,500 acres have been identified as desirable for addition to Ichetucknee Springs State Park. The majority of the additional land lies to the northwest of the park and contains significant examples of longleaf pine and xeric oak sandhill community. The area will offer additional protected territory for listed species, such as the southern fox squirrel and the southeastern American kestrel, and other species. Several aquatic caves exist within the area, which have been demonstrated to share hydrological connections with the park's springs. The recommended additions north of the park have a significant and demonstrated relationship with the spring system. Potential agricultural or urban development near the park may alter long-term resource conservation and restoration goals. Acquisition of these recommended areas will help to protect surface and groundwater flows into the Ichetucknee Springs and River. Lands immediately adjacent to the park on the east, south, and west boundaries are considered significant for each of the identified reasons. These areas also contain resource elements that will complement the recreational opportunities currently found within Ichetucknee Springs State Park.

No lands are considered surplus to the management, conservation, or public access needs of the park at this time.



ICHETUCKNEE SPRINGS
STATE PARK

N

0 0.375 0.75 1.5 Miles

Florida Department of Environmental Protection
Division of Recreation and Parks
Date of aerial; 2011

OPTIMUM BOUNDARY MAP

IMPLEMENTATION COMPONENT

The resource management and land use components of this management plan provide a thorough inventory of the park's natural, cultural, and recreational resources; outlining the management needs and problems of the park while recommending both short and long-term objectives and actions to meet those needs. The implementation component addresses the administrative goal for the park and reports on the Division of Recreation and Parks (DRP) progress toward achieving resource management, operational and capital improvement goals and objectives since approval of the previous management plan for this park. This component also compiles the management goals, objectives and actions expressed in the separate parts of this management plan for easy review. Estimated costs for the ten-year period of this plan are provided for each action and objective, and the costs are summarized under standard categories of land management activities.

MANAGEMENT PROGRESS

Since the approval of the last management plan for Ichetucknee Springs State Park in 2000, significant work has been accomplished and progress made towards meeting the DRP's management objectives for the park. These accomplishments fall within three of the five general categories that encompass the mission of the park and the DRP.

Acquisition

- New fences installed and/or repaired at Zones 1B, 1C, 1D, 1E, 2B, 2C, 2F, 4A, 4B, 4G, and 4H (2000-2016).
- Saylor Sink parcel acquired (around/just prior to 2000).
- Multiple parcels at Rose Sink acquired and annexed (2000 to present).
- Temporary management of Lafayette Blue Spring until separate administrative staff assigned (around 2004; no longer under Ichetucknee administration after c.2005-6).
- McCormick Tract acquired (2004).
- Formal park boundary survey for Zone 3D (south of U.S. Highway 27) in 2004-05.
- Temporary management of Little River Spring (Suwannee County)—around 2005-6; no longer under Ichetucknee administration after 2006-7.
- Formal park boundary survey for Zone 4G (north of C.R. 238) in 2008-09.
- Addition of Zone 4H at Ichetucknee Springs (20 acres at northeastern quadrant of park just north of Ichetucknee Springs private campground) around 2009 or just prior; new fence installed.
- Acquisition/transfer of Ichetucknee Trace Tract (formerly Kirby Pits) after several multi-agency transfers, around 2010 (last manager was Office of Greenways and Trails).
- Transfer of Wes Skiles Peacock Springs State Park to Lafayette Blue/Suwannee River Wilderness Trail around 2011-12 (formerly an Ichetucknee Springs satellite park).
- Transfer of Troy Spring State Park (and related Suwannee River springs tracts—Owens, Adams, Ruth) to Suwannee River Wilderness Trail around 2014 (formerly an Ichetucknee Springs satellite park).

Park Administration and Operations

- Park Administrative Office moved from North Ranger Station to Environmental Education Center complex around 2002-03.
- Park Services Specialist FTE position added (upgraded from a Park Ranger position) in 2006.
- Environmental Specialist I FTE position (Park Biologist) upgraded to full-time Ichetucknee Springs position in 2008.
- Friends of Ichetucknee Springs State Park, Inc. (CSO) active 1998-2007/8; inactive from 2008 to 2013; re-instated and active 2013 to present.
- Residential volunteer sites initially installed 1998-2005 as full-service (two in Zone 2Hw near Head Spring Visitor Use Area; one near North Shop; two near PM residence).
    - The two near the PM residence were discontinued in 2005
    - The North Shop vic. site was downgraded to a primitive site (no longer full service) in 2006-07.
    - Two new sites installed/re-activated near PM residence in 2014.
    - One new full-service site established within South Shop complex in 2015/16.
    - Residential volunteer sites as of 2016: six total (two full-service at Zone 2Hw near Head Spring Visitor Use Area; one primitive near North Shop; one full-service at South Shop; two full-service near PM residence).
- Volunteer program enhanced from less than 20 active volunteers per year to over 50 per year with over 242,500 grand total person-hours through 2015 (an average of 15,150 person-hours per year).
- Volunteer program enhanced with addition of formalized training protocols, over 20 position descriptions, and newly available on-line processing and reporting (2015).
- Concessionaire contract modified in 2015/16 to include Tram Service between Midpoint Launch and Last Take-out; Van-shuttling from North Entrance during summer Tubing Season; enhance restaurant and gift shop services; canoe/kayak/paddleboard rentals from facility near North Launch.

Resource Management

Natural Resources

- Taxonomic Inventory
    - Regular updates of vertebrate species listing, including image inventory, to include 340 total species of mammals (41), birds (183), reptiles (52), amphibians (22), and fish (42) as of 2016.
    - Generation of butterfly and moth species listing, including image inventory, for 59 butterfly species and 428 moth species as of 2016.
    - Generation of partial listings for other groups of invertebrates such as major insect classes (Odonata, Coleoptera, Hymenoptera), arachnids, snails, and bivalves.
    - Regular updates of vascular plant listing, including image inventory, to include 672 species as of 2016. Of this total, 564 species (84%) are

native. Of the 108 non-native species, 22 species (3.25% of total species) are classed invasive species with ongoing removal/reduction efforts.
    - Since 2000, 88% of the park's plant species have been photographed and indexed; all uncommon and rare plant species, including those of designated statuses, have been mapped via a master plant occurrence file.
    - The park maintains a month-to-month file of roadkill observations within the park or nearby the park boundaries.
- Designated Species Monitoring and Research
    - Since 2000, the park has maintained a wildlife sightings inventory for rare and/or protected plants and animals.
    - Over 325 of the park's Gopher Tortoises have been identified in a mark/release/recapture survey to collect data on home range movements and occurrence of Upper Respiratory Tract Disease.
    - In 2014 an FWC-funded survey by the Jones Ecological Research Center conducted a LTDS survey at Ichetucknee Springs and estimated a population size of 1269 tortoises with a density of 3.97 tortoises/hectare. The park has a Tier 1 ranking in the Survey Prioritization Blueprint (FWC 2018) and is a high priority for future surveys.
    - The park's Southeastern American Kestrel population is tracked through a banding program utilizing nesting boxes (13) in appropriate Sandhill habitat.
    - The park maintains a Florida Manatee sighting and scar pattern tracking database.
    - Other research initiatives have conducted short- and long-term studies on designated or proposed-for-designation species such as Florida Mouse, Southern Fox Squirrel, Bachman's Sparrow, Eastern Indigo Snake, and the Ichetucknee Silt Snail.
    - The park participates in river turtle monitoring through capture/mark/recapture techniques coordinated by Santa Fe Community College and the North American Freshwater Turtle Research Group.
- Exotic Plant Removal/Monitoring
    - Of the 108 non-native (exotic) plant species, 22 species (3.25% of total species) are classed as invasive species with ongoing removal/reduction efforts.
    - Since approval of the last Ichetucknee Unit Management Plan in 2000, through FY 2014/15, over 1,200 acres of exotic plants have been treated at the park.
    - Major control efforts, some through OPS expenditures, grants, and/or contract herbicide companies, continue on an annual basis for Waterlettuce, Japanese Climbing Fern, Chinese Wisteria, Mimosa-tree, and Cogon Grass.
    - Waterlettuce manual removal efforts were enhanced in 2000-2008, utilizing volunteer workdays; during the removal phase, 17,000 volunteers donated nearly 25,000 hours to clean the river; during the

maintenance phase, 2008-2015, 244 volunteers donated 4,200 hours to keep waterlettuce in check on the Ichetucknee River.
    - Exotic plant monitoring has been formalized through the Natural Resources Tracking System database in 2015-16, with regular surveys and treatment assessment.
- Exotic Animal Removal
    - Since approval of the last Unit Management Plan for Ichetucknee in 2000, through FY 2014/15, a total of 195 nuisance or exotic animals, comprising nine different species, have been removed from the park.
    - A Feral Hog infestation from 2009 through 2012 was successfully trapped and removed (over 100 animals) through USDA contract efforts, with continued monitoring and trap deployment after 2012.
- Prescribed Burning
    - The park burned 4,150 acres from 2000-2015, averaging about 277 acres per year. From 2009/10 through 2014/15, the parked burned an average of 447 acres per year.
    - Firelane installation and upgrading, along with initial prescribed burn plans, continue for newer parcels such as Saylor Sink, McCormick Tract, and Ichetucknee Trace Tract.
- Habitat Restoration
    - In addition to prescribed burning, the park also accomplishes supplemental plantings of Longleaf Pines (over 30,000 seedlings since 2000) and some secondary species planting in sensitive Sandhill areas.
    - Ichetucknee remains a donor site for FPS secondary species seed-collection for nearby parks.
    - Selective hardwood girdling and other hardwood reduction treatments are selectively applied to some overgrown and/or ecotonal Sandhill areas as supplemental foci coordinating with the prescribed burning program.
    - An Ichetucknee River SAV vegetation study utilizes 20 point-intercept transects to measure water recreation damage to SAV beds, along with system recovery, before and after each tubing season; quantitative measurements have been taken semi-annually since 1989 and are primary tools for determining if the 750-person limit (North Launch to Midpoint Launch) and the 2,250-person limit (Midpoint Launch to Dampier's Landing) are adequate carrying capacity limits.
- Hydrological Monitoring
    - The park participates through regular monitoring programs for water quality and water chemistry sampling, fish tissue analysis, benthic macroinvertebrate sampling and inventory, and stream/spring discharge dynamics; efforts are coordinated largely through Suwannee River Water Management District, Florida Geological Survey, the DEP Bureau of Laboratories and other Offices, and short-term University research projects.
    - The park assists and coordinates with the Suwannee River Water Management District with research, data-collection, and implementation of legislatively mandated programs such as TMDL, Florida Outstanding Waters, etc.

- The park participates in community outreach programs such as the Ichetucknee Basin Water Quality Working Group, The Florida Springs Task Force, The Santa Fe Springs Water Quality Working Group, and the Odum Florida Springs Institute, among other entities, to coordinate springs basin protection initiatives and address water conservation issues.
- The park maintains in-house records for water levels and rainfall.

Cultural Resources

- The park maintains an Archaeological Research Monitoring program, complete with training of personnel, cultural site inventory and nomination, cultural site damage monitoring, etc.
- The park successfully nominated over 20 new cultural sites during 2009, to bring the total park Florida Master Site File sites to 53.
- An archaeological impact/site concentration study was conducted in the park in 2012-13.
- The park participated in a pilot ASCAP monitoring program for a selected number of cultural sites during 2013-14.
- ARM and other staff have conducted annual site inspections and maintained an ARM Notebook since 2013 for all park cultural sites (53 total).
- The park maintains a Statement of Collections, as well as PastPerfect inventory management; park collections were updated in 2014 to include over 600 objects or object assemblages.

Recreation and Visitor Services

- The park maintains a Statement of Interpretation, with major updates in 2005-06, 2009-10, and 2015-16; minor updates added on an annual basis.
- The park has substantially enhanced its interpretive programming profile, adding over 20 new programs since 2009; interpretive program participation has increased dramatically, with over 7,000 contacts during 2014 and 2015.
- The park initiated the PARKnership program with Fort White Middle School and Fort White High School in 2003, working with students, faculty, and administrators to develop an award-winning outdoor laboratory blueprint with the park as the primary host site.
- The park served as Site Coordinator and Facilitators for the LIFE program from 2005 to 2012, a part of the PARKnership program.
- Richardson Middle School was added to the park's LIFE program roster in 2009-10.
- Two student teams—one headquartered at FWMS (League of Environmentally Active Kids, formed in 2005-06) and one headquartered at the park (The NatureFreaks, formed in 2014) perform visitor service and resource management volunteer work projects.
- The park maintains an Environmental Education Center, opened 2004, as an interpretive contact point and training/student lab facility, complete with meeting auditorium and assemblage of special Florida Spring interpretive displays.
- The park established a Butterfly & Native Plant Garden in 2007 next to the Environmental Education Center, expanded into a children's interpretive

Discovery Trail in 2008, with a large gopher tortoise enclosure for tortoises held under permit for educational purposes in 2009.

- The Discovery Trail and Butterfly Garden were renovated and re-designed in 2014-15.
- Captive animals were added to the park's interpretive offerings in 2002 with a permitted Indigo Snake; the present inventory now includes three Gopher Tortoises (added 2004 with offspring in 2013), a Gray Rat Snake, a Yellow Rat Snake (both in 2013), River Cooter and Yellow-bellied Slider (both in 2014), and a Florida Box Turtle (2016); all animals are housed at the Environmental Education Center and its outdoor enclosures.
- A "Tuber Overflow" Trail was established in 2010-11 from the South Takeout facility to the Main South parking area to serve park visitors during times of congestion/back-up of Tram Services during the summer tubing season (or as a nature trail at other times).
- Concessionaire services were expanded during 2016 to include a General Store operating the park's tram and shuttle services at the Main South parking lot; a canoe/kayak/paddleboard livery service (Paddling Adventures) was also established at the North Canoe/Tube Launch vicinity.

Park Facilities

- Just prior to 2000-2002: Wooden docks/launches removed from Midpoint Launch and Dampier's Landing and replaced with aluminum floating docks/launches.
- 2002-2003: Expansive, fixed aluminum landing built at South Takeout.
- 2003: Park Administrative Office built.
- 2004-2005: Environmental Education Center built and opened.
- 2004-2005: Restroom facility built at Head Spring Visitor Use Area after treefall destroyed the old facility.
- 2006-2008: Sidewalk facilities installed to serve Head Spring Restroom.
- 2005-2012: Restroom facility near Canoe/Tube Launch abandoned and condemned after failure at water well.
- 2014-2015: Boardwalk at Headspring parking lot, servicing Blue Hole Trail ("Trace Boardwalk") replaced with ADA boardwalk.
- 2016: South Takeout landing facility removed and replaced by river exit concrete platform and ADA boardwalk.
- 2016: North Launch old restroom renovated as business facility of Paddling Adventures concessionaire.
- 2016: Concession Building at Main South Parking renovated to enclose open breezeway for ticket counter and gift shop sales for General Store concessionaire.
- Some budget monies released for renovation of Dampier's Landing docks and launch.
- Approval for future project at Ichetucknee Headspring to repair old stone walls and install ADA wheelchair lift and boardwalk.

MANAGEMENT PLAN IMPLEMENTATION

This management plan is written for a timeframe of ten years, as required by Section 253.034 Florida Statutes. The Ten-Year Implementation Schedule and Cost Estimates (Table 10) summarizes the management goals, objectives and actions that are recommended for implementation over this period, and beyond. Measures are identified for assessing progress toward completing each objective and action. A time frame for completing each objective and action is provided. Preliminary cost estimates for each action are provided and the estimated total costs to complete each objective are computed. Finally, all costs are consolidated under the following five standard land management categories: Resource Management, Administration and Support, Capital Improvements, Recreation Visitor Services, and Law Enforcement.

Many of the actions identified in the plan can be implemented using existing staff and funding. However, several continuing activities and new activities with measurable quantity targets and projected completion dates are identified that cannot be completed during the life of this plan unless additional resources for these purposes are provided. Recommended actions, time frames and cost estimates of this plan will guide the DRP planning and budgeting for management activities over the period of this plan. It must be noted that these recommendations are based on the information that exists at the time the plan was prepared. A high degree of adaptability and flexibility must be built into this process to ensure that the DRP can adjust to changes in the availability of funds, improved understanding of the park's natural and cultural resources, and changes in statewide land management issues, priorities and policies.

Statewide priorities for all aspects of land management are evaluated each year as part of the process for developing the DRP's annual legislative budget requests. When preparing these annual requests, the DRP considers the needs and priorities of the entire state park system and the projected availability of funding from all sources during the upcoming fiscal year. In addition to annual legislative appropriations, the DRP pursues supplemental sources of funds and staff resources wherever possible, including grants, volunteers and partnerships with other entities. The DRP's ability to accomplish the specific actions identified in the plan will be determined largely by the availability of funds and staff for these purposes, which may vary from year to year. Consequently, the target schedules and estimated costs identified in Table 10 may need to be adjusted during the ten-year management planning cycle.

Table 10
Ichetucknee Springs State Park Ten-Year Implementation Schedule and Cost Estimates

NOTE: THE DIVISION'S ABILITY TO COMPLETE THE OBJECTIVES OUTLINED BY THE MANAGEMENT PLAN IS CONTINGENT ON THE AVAILABILITY OF FUNDING AND OTHER RESOURCES FOR THESE PURPOSES.

Goal I: Provide administrative support for all park functions		**Measure**	**Planning Period**	**Estimated Manpower and Expense Cost* (10-years)**
Objective A	**Continue day-to-day administrative support at current levels**	Administrative support ongoing	C	**$1,539,563**
Objective B	**Expand administrative support as new lands are acquired, new facilities are developed, or as other needs arise**	Administrative support expanded	C	**$19,612**
Goal II: Protect water quality and quantity in the park, restore hydrology to the extent feasible, and maintain the restored condition		**Measure**	**Planning Period**	**Estimated Manpower and Expense Cost* (10-years)**
Objective A	**Conduct/obtain an assessment of the park's hydrological restoration needs**	Assessment conducted	C	**$68,300**
Action 1	Continue to cooperate with all state agencies and independent researchers on hydrological research and monitoring programs and routinely analyze results.	Cooperation and analysis ongoing	C	$29,800
Action 2	Continue to work with FDEP regulatory personnel during implementation of BMAP standards for the Ichetucknee system.	Cooperation ongoing	LT	$2,500
Action 3	Encourage FDEP to resume Rapid Periphyton Assessments in the park, and develop and implement a plan to conduct semiannual periphyton assessments at the park's eight major springs.	Plan implemented	C	$8,000
Action 4	Periodically assess the condition and effectiveness of septic systems associated with park facilities.	Assessment ongoing	C	$25,000
Action 5	Promote the continued monitoring of groundwater levels and spring flows within the Ichetucknee Springshed.	Monitoring continued	C	$1,000
Action 6	Work with the SRWMD and other agencies to track adopted MFL's and review annual MFL assessments.	Cooperation and review ongoing	LT	$2,000

* 2021 Dollars
ST = actions within 2 years
LT = actions within 10 years
C = long term or short term actions that are continuous or cyclical
UFN = currently unfunded need

Table 10
Ichetucknee Springs State Park Ten-Year Implementation Schedule and Cost Estimates

NOTE: THE DIVISION'S ABILITY TO COMPLETE THE OBJECTIVES OUTLINED BY THE MANAGEMENT PLAN IS CONTINGENT ON THE AVAILABILITY OF FUNDING AND OTHER RESOURCES FOR THESE PURPOSES.				
Objective B	**Restore natural hydrological conditions and function to approximately 10 acres of spring-run-stream natural community**	# Acres restored or with restoration underway	C	**$260,400**
Action 1	Continue to coordinate with agencies responsible for the protection and improvement of hydrological resources within the Ichetucknee Springshed and with local governments responsible for land use planning in the Ichetucknee area.	Coordination ongoing	C	$27,000
Action 2	Work closely with state and federal agencies to mitigate the increased nutrient levels at Ichetucknee, and assist with implementation of the BMAP developed to meet TMDL requirements.	Cooperation ongoing	C	$7,000
Action 3	Work closely with the SRWMD during implementation of MFLs for the Ichetucknee, and provide formal feedback if spring discharges fall below MFL thresholds, causing degradation of the river.	Cooperation ongoing	C	$5,100
Action 4	Pursue outreach opportunities and develop programming to educate the public about anthropogenic impacts to the Ichetucknee system.	Programs developed	C	$6,000
Action 5	Seek funding and consider implementation of a long-term SAV monitoring program on the Ichetucknee River	Studies ongoing	C	$178,000
Action 6	Seek funding and conduct dye trace studies in the Ichetucknee Springshed but specifically to determine groundwater sources for Coffee Spring	Studies ongoing	C	$32,000
Action 7	Examine the feasibility of conducting experimental plantings of submerged aquatic vegetation at sites affected by post-2000 die offs.	Experiments designed	ST	$1,100
Action 8	Implement erosion control measures to protect water quality in all park surface waters.	Measures implemented	C	$4,200
Objective C	**Evaluate impacts of visitor use on the Ichetucknee River system and mitigate as needed**	Evaluations conducted	C	**$38,600**
Action 1	Continue to monitor aquatic vegetation transects each spring and fall to determine long-term impacts of visitor use, including effects on water quality.	Monitoring ongoing	C	$19,800
Action 2	Continue annual photo point monitoring at sensitive locations along the Ichetucknee River to track changes in vegetative cover.	Monitoring ongoing	C	$6,500
Action 3	Continue to evaluate the recreational carrying capacity of the river and its springs to determine the relationship between type and intensity of visitor use and the health of the system. Recreational adjustments may be required including possible closure of the upper river to tubing and swimming.	Evaluations ongoing & adjustments made	C	$9,800
Action 4	Continue to provide prompt response to water quality threats to the Ichetucknee that may be attributable to location or design of park facilities.	Responses made as needed	C	$2,500

* 2021 Dollars
ST = actions within 2 years
LT = actions within 10 years
C = long term or short term actions that are continuous or cyclical
UFN = currently unfunded need

NOTE: THE DIVISION'S ABILITY TO COMPLETE THE OBJECTIVES OUTLINED BY THE MANAGEMENT PLAN IS CONTINGENT ON THE AVAILABILITY OF FUNDING AND OTHER RESOURCES FOR THESE PURPOSES.

Goal III: Restore and maintain the natural communities/habitats of the park		**Measure**	**Planning Period**	**Estimated Manpower and Expense Cost* (10-years)**
Objective A	**Within 10 years have 1460 acres of the park maintained within optimal fire return interval**	# Acres within fire return interval target	LT	**$546,000**
Action 1	Develop/update annual burn plan.	Plan updated	C	$16,000
Action 2	Manage fire dependent communities for ecosystem function, structure and processes by burning between 490-975 acres annually, as identified by the annual burn plan.	Average # acres burned annually	C	$490,000
Action 3	Establish new perimeter and internal firebreaks at the McCormick and Saylor Sink parcels	# Miles established	ST	$40,000
Objective B	**Conduct habitat/natural community restoration activities on 225 acres of upland pine and upland mixed woodland natural communities**	# Acres restored or with restoration underway	C	**$42,700**
Action 1	On average conduct off-site hardwood removal on ten acres per year and conduct necessary follow-up management activities.	# of Acres treated	C	$22,000
Action 2	Assess the 125-acre restoration area and implement groundcover restoration where necessary.	# Acres with restoration underway	ST	$20,000
Action 3	Map the remnant longleaf pines within the fire-suppressed upland pine and upland mixed woodland communities.	Mapping complete	ST	$700
Objective C	**Conduct habitat/natural community improvement activities on 25 acres of sandhill community**	# Acres improved or with improvements underway	ST	**$8,900**
Action 1	Chemically treat and remove off-site hardwoods from zone 2D or 2F.	# Acres treated	ST	$5,500
Action 2	Plant longleaf pine seedlings in zone 2D or 2F.	Planting complete	ST	$3,400

* 2021 Dollars
ST = actions within 2 years
LT = actions within 10 years
C = long term or short term actions that are continuous or cyclical
UFN = currently unfunded need

NOTE: THE DIVISION'S ABILITY TO COMPLETE THE OBJECTIVES OUTLINED BY THE MANAGEMENT PLAN IS CONTINGENT ON THE AVAILABILITY OF FUNDING AND OTHER RESOURCES FOR THESE PURPOSES.

Goal IV: Maintain, improve or restore imperiled species populations and habitats in the park		**Measure**	**Planning Period**	**Estimated Manpower and Expense Cost* (10-years)**
Objective A	**Monitor and document 7 selected imperiled animal species in the park**	# Species monitored	C	**$18,000**
Action 1	Develop and implement monitoring protocols for 6 imperiled animal species including gopher tortoise, Suwannee cooter, southeastern kestrel, West Indian manatee, southern fox squirrel, Ichetucknee siltsnail, troglobitic arthropods.	# Species monitored	C	$18,000
Objective B	**Monitor and document 2 selected imperiled plant species in the park**	# Species monitored	C	**$2,000**
Action 1	Develop monitoring protocol for harvest lice.	Protocol developed	ST	$500
Action 2	Implement monitoring protocols for 2 imperiled plant species including those listed in Action 1 above and Florida willow.	# Species monitored	C	$1,500
Objective C	**Compile and convert imperiled species distribution and abundance data into electronic format in a geospatial database**	Project completed	LT	**$1,500**

Goal V: Remove exotic and invasive plants and animals from the park and conduct needed maintenance-control		**Measure**	**Planning Period**	**Estimated Manpower and Expense Cost* (10-years)**
Objective A	**Annually treat 10 acres of exotic plant species in the park**	# Acres treated	C	**$116,000**
Action 1	Develop, annually update and implement exotic plant management annual work plan.	Plan Updated and implemented	C	$16,000
Action 2	Implement annual work plan by treating a total of 10 acres annually, and continuing maintenance and follow-up treatments as needed.	# Acres treated	C	$100,000
Action 3	Survey, map and develop control plans for invasive exotic plants within the Rose Sink, Saylor Sink, and McCormick properties.	Plans developed	ST	$700
Objective B	**Develop and implement measures to prevent the accidental introduction or further spread of invasive exotics in the park**	Measures developed and implemented	ST	**$7,000**
Action 1	Conduct surveys for invasive exotics in every zone in the park at least twice in the next 10 years.	Surveys completed	LT	$5,000
Action 2	Develop and implement a protocol for equipment use in the park designed to prevent the accidental introduction or spread of exotics.	Protocol developed and implemented	ST	$2,000

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ST = actions within 2 years
LT = actions within 10 years
C = long term or short term actions that are continuous or cyclical
UFN = currently unfunded need

NOTE: THE DIVISION'S ABILITY TO COMPLETE THE OBJECTIVES OUTLINED BY THE MANAGEMENT PLAN IS CONTINGENT ON THE AVAILABILITY OF FUNDING AND OTHER RESOURCES FOR THESE PURPOSES.				
Objective C	**Implement control measures on 3 exotic and nuisance animal species in the park**	# Species for which control measures implemented	C	**$22,700**
Action 1	Continue control activities on feral hogs.	# removed	C	$20,000
Action 2	Continue to relocate feral or stray cats and dogs to County Animal Control facility as necessary.	# relocated	C	$2,700
Goal VI: Protect, preserve and maintain the cultural resources of the park.		**Measure**	**Planning Period**	**Estimated Manpower and Expense Cost* (10-years)**
Objective A	**Assess and evaluate 25 of 55 recorded cultural resources in the park**	Documentation complete	LT	**$61,990**
Action 1	Complete 25 assessments/evaluations of archaeological sites. Prioritize preservation and stabilization	Assessments complete	LT, ST	$1,990
Action 2	Evaluate and document three historic structures and one historic site for significance and necessary treatment.	Reports and priority lists completed	LT	$60,000
Objective B	**Compile reliable documentation for all recorded historic and archaeological sites**	Documentation complete	LT	**$4,610**
Action 1	Ensure all known sites are recorded or updated in the Florida Master Site File.	# Sites recorded or updated	ST	$160
Action 2	Compile additional documentation on past phosphate mining operations within the park.	Documentation complete	LT	$350
Action 3	Develop and adopt a Scope of Collections Statement.	Document completed	ST	$2,300
Action 4	Continue to conduct oral history interviews during "Old Timers Day"	Interviews complete	LT	$1,800
Objective C	**Bring 6 of 58 recorded cultural resources into good condition**	# Sites in good condition	LT	**$50,800**
Action 1	Design and implement regular monitoring programs for 6 cultural sites	# Sites monitored	C	$1,500
Action 2	Create and implement a cyclical maintenance program for each cultural resource.	Programs implemented	C	$24,300
Action 3	Design and implement one project to restore, rehabilitate, stabilize, preserve, deconstruct, or demolish historic buildings or structures..	Project implemented	LT	$25,000
Goal VII: Provide public access and recreational opportunities in the park.		**Measure**	**Planning Period**	**Estimated Manpower and Expense Cost* (10-years)**
Objective A	**Maintain the park's current recreational carrying capacity of 3,140 users per day**	# Recreation/visitor	C	**$1,539,563**
Objective B	**Expand the park's recreational carrying capacity by 40 users per day**	# Recreation/visitor	ST or LT	**$19,612**
Objective C	**Continue to provide the current repertoire of 10 interpretive, educational and recreational programs on a regular basis**	# Interpretive/education programs	C	**$50,000**
Objective D	**Develop 1 new interpretive, educational and recreational program**	# Interpretive/education programs	ST or LT	**$7,000**

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ST = actions within 2 years
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UFN = currently unfunded need

Table 10
Ichetucknee Springs State Park Ten-Year Implementation Schedule and Cost Estimates

NOTE: THE DIVISION'S ABILITY TO COMPLETE THE OBJECTIVES OUTLINED BY THE MANAGEMENT PLAN IS CONTINGENT ON THE AVAILABILITY OF FUNDING AND OTHER RESOURCES FOR THESE PURPOSES.

Goal VIII: Develop and maintain the capital facilities and infrastructure necessary to meet the goals and objectives of this management plan		**Measure**	**Planning Period**	**Estimated Manpower and Expense Cost* (10-years)**
Objective A	**Maintain all public and support facilities in the park**	Facilities maintained	C	**$1,724,310**
Objective B	**Continue to implement the park's transition plan to ensure facilities are accessible in accordance with the American with Disabilities Act of 1990**	Plan implemented	ST or LT	**$80,000**
Objective C	**Improve and/or repair 1 existing facility as identified in the Land Use Component**	# Facilities/Miles of Trail/Miles of Road	LT	**$120,000**
Objective D	**Construct 2 new facilities and 1 mile of trail as identified in the Land Use Component**	# Facilities/Miles of Trail/Miles of Road	LT	**$900,250**
Objective E	**Expand maintenance activities as existing facilities are improved and new facilities are developed**	Facilities maintained	C	**$21,966**

Summary of Estimated Costs

Management Categories		**Total Estimated Manpower and Expense Cost* (10-years)**
Resource Management		**$1,249,500**
Administration and Support		**$1,559,175**
Capital Improvements		**$1,002,216**
Recreation Visitor Services		**$1,616,175**
Law Enforcement Activities[1]		
	1Law enforcement activities in Florida State Parks are conducted by the DEP Division of Law Enforcement and by local law enforcement agencies.	

* 2021 Dollars
ST = actions within 2 years
LT = actions within 10 years
C = long term or short term actions that are continuous or cyclical
UFN = currently unfunded need

Addendum 1—Acquisition History

LAND ACQUISITION HISTORY REPORT

Park Name	Ichetucknee Springs State Park
Report Date	5/19/2016
County Jurisdiction(s)	Columbia and Suwannee counties, Florida
Trustees Lease Number	Lease No. 2459
Current Park Size	2,531.87 acres

Purpose of Acquisition	*The purpose of acquisition of this park property is not stated in the acquisition deeds. Based on funding sources used to acquire parcels that constitute the the currrent area of the park, it can be reasonably assumed that the primary purpose for acquiring the propety was to conserve and protect natural resources and use the area for compatible purposes.*

Acquisition History

Parcel Name or Parcel DM-ID	Date Acquired	Initial Seller	Initial Purchaser	Size in acres	Instrument Type
MDID 341098	7/2/2004	The Trust for Public Land	The Board of Trustees of the Internal Improvement Trust Fund of the State of Florida (Trustees)	148.884	Special Warranty Deed
MDID12464	7/3/1993	United States of America	Trustees	86.988	Quit Claim Deed
MDID313321	10/12/2001	Meridith L. Lapradd	Trustees	78.925	Warranty Deed
MDID337899	10/12/2004	Albert S. Levings, Jr.	Trustees	20.063	Warranty Deed

Management Lease

Parcel Name or Lease Number	Date Leased	Initial Lessor	Initial Lessee	Current Term	Expiration Date
Lease No. 2459	9/4/1970	The Board of Trsustees of the internal Improvement Trust Fund of the State of Florida	State of Florida Department of Natural Resources for the use and benefit of the Division of Recreation and Parks	99 years	9/3/2069

Outstanding Issue	Type of Instrument	Brief Description of the Outstanding Issue	Term of the Outstanding Issue
There is no known deed related issue that prohibits or restricts the use of Ichetucknee Springs State Park.			

Addendum 2—Advisory Group Members and Report

Local Government Representatives

Commissioner Ronald Williams, Chair
Columbia County Board of County Commissioners

Commissioner Ricky Gamble, Chair
Suwannee County Board of County Commissioners

Lamar Moseley, Chair
Columbia County Soil and Water Conservation District

Andy Jackson, Chair
Suwannee County Soil and Water Conservation District

Agency Representatives

Robert Soderholm, Manager
Ichetucknee Springs State Park
Division of Recreation and Parks

Ginger Morgan, Landowner Assistance Coordinator
North Central Florida Region
Florida Fish and Wildlife Conservation Commission

Doug Longshore, Regional Forester
North Florida Region
Florida Forest Service

Edwin McCook, Land Management Specialist
Suwannee River Water Management District

Jason O'Donoughue, Public Lands Archaeologist
Division of Historical Resources, Bureau of Archaeological Research

Environmental and Conservation Representatives

John Jopling, President
Ichetucknee Alliance

Trisha Haight, President
Sparkleberry Chapter
Florida Native Plant Society

Tourism and Economic Development Representatives

Paula Vann, Executive Director
Columbia County Tourist Development Council

Jimmy Norris, Executive Director
Suwannee County Chamber of Commerce

Recreational and Educational User Representatives

Joseph Citelli, Chair
Florida Speleological Society, Cave Diving Section

William Stasiewicz, Director
Suwannee Region
Florida Paddling Trails Association

Adjacent Landowner

Loye Barnard, residential property owner

Citizen Support Organization

Trini Johannesen, President
Friends of Ichetucknee Springs State Park

Ichetucknee Springs State Park and Troy Spring State Park

Advisory Group Meeting Report

The advisory group meeting to review the proposed unit management plans (UMP) for Ichetucknee Springs State Park and Troy Spring State Park was held in the city of Fort White at the Fort White Community Center on Thursday, March 30, 2017 at 9:00 AM.

Commissioner Bobby Sasnett represented the Holmes County Board of County Commissioners. Ronald Williams, Ricky Gamble, and Earnest Jones, Lamar Moseley, Steve Walker, Trisha Haight, Melissa Harris, Jimmy Norris, and Vi Johnson were not in attendance. Bob Knight represented the Ichetucknee Alliance. Al Clements represented the Florida Speleological Society. Jason O'Donoughue submitted written comments for the Division of Historical Resources in advance of the meeting. All other appointed advisory group members were present.

Attending Division of Recreation and Parks (DRP) staff members were Clifton Maxwell, Brian Fugate, Craig Parenteau, Rick Owen, Dan Pearson, Robert Soderholm, Justin Tiseth, Sam Cole, William Register, Amy Conyers, Jennifer Miller, and Daniel Alsentzer.

Mr. Alsentzer began the meeting by explaining the purpose of the advisory group and reviewing the meeting agenda. He provided a brief overview of the DRP's planning process and summarized public comments received during the public hearing as well as the written comments received from members not in attendance. Mr. Alsentzer then asked each member of the advisory group to express his or her comments on the draft plans. After all comments were shared, Mr. Alsentzer described next steps for drafting the plans and the meeting was adjourned.

Summary of Advisory Group Comments

Ginger Morgan (Florida Fish and Wildlife Conservation Commission (FWC)) recommended using photographic documentation of fox squirrels to supplement written descriptions. Ms. Morgan inquired about fire return intervals; why the entirety of the park's fire-type acreage is not included under the ten-year objective. District staff explained that not all areas identified with a desired future condition of upland mixed woodland and upland pine are burnable at this time due to hardwood invasion, and would accordingly need additional restoration measures before successfully carrying fire. Ms. Morgan recommended adding an explanation of this factor to the fire management program section. She recommended that the DRP project future conditions to allow for adaptive management, especially as methodologies are subject to change over the 10-year period. Ms. Morgan noted the title status of the Ichetucknee siltsnail and inquired about the proper common name for the short-tailed snake. She suggested adding the brown-headed nuthatch to the park's monitored species list. She recommended including the Santa Fe crayfish as a State Threatened species in the Imperiled Species Table. Ms. Morgan noted that seasonally high visitation on the Ichetucknee River results in high turbidity and trampling of submerged aquatic vegetation. She encouraged the DRP to further evaluate the carrying capacity to protect aquatic habitat during both low and high water events, particularly in the grassy flats area.

Doug Longshore (Florida Forest Service (FFS)) inquired whether the Ichetucknee Trace parcels are managed as separate units from Ichetucknee Springs State Park. DRP staff explained that Ichetucknee Trace is a separate park unit and provided a brief overview of its purpose and access. Mr. Longshore stated that the proposed resource management goals and objectives for both Ichetucknee Springs and Troy Spring are appropriate for the existing and desired future conditions and consistent with best management practices.

Al Clements (Florida Speleological Society) appreciated that the DRP has recently opened Blue Hole to year-round access for both swimming and diving user groups, but advised that diving access may be challenging during busy swimming visitation. Mr. Clements commented that graffiti has occasionally been carved into limestone by scuba and free divers, but that conservation/leave no trace principles are being emphasized in open water scuba training. He noted that cavern and cave dive training programs have long educated on the sensitivity of karst features. Mr. Clements affirmed the revenue benefits of requiring additional fees for diving access. He commented on the volume of litter that formerly characterized the access areas at Ichetucknee Springs and Troy Spring prior to state acquisitions. He appreciated the opportunity for a representative of the cave diving community to attend the advisory group meeting for both Ichetucknee Springs and Troy Spring state parks.

Michael Stine (North Florida Springs Alliance) reminded the advisory group that this citizen support organization (CSO) no longer includes Ichetucknee Springs State Park, but that he and members of the CSO are highly familiar with the park. He commended the plan, but referenced the water quality and quantity issues in the Ichetucknee Springs system. Mr. Stine elaborated on the rapid recovery of troglobite populations as observed in the cave fauna surveys. He noted that the CSO volunteers have been successful in efforts to remove graffiti from the park's caves. Mr. Stine encouraged instituting an additional access fee for divers at Ichetucknee Springs and Troy Spring and stated that such a fee would not discourage use and would considerably raise revenue. Mr. Stine suggested that the population of Hobbs cave amphipod may be greater than estimated but is difficult to confirm. He stated that reductions of flow level and pollution are of equal concern at Troy Spring as at Ichetucknee Springs.

Trini Johannesen (Friends of Ichetucknee Springs State Park) emphasized the importance of community and educational outreach in park programming. She commended the draft plan for proposing additional programs of this type and encouraged collaboration with area schools. She noted that Columbia County has integrated springs protection into academic curricula. Ms. Johannesen offered the support of the CSO in interpretive/educational outreach.

Loye Barnard (adjacent landowner, Ichetucknee Springs) stated that the Ichetucknee Springs State Park offers remarkable recreational and interpretive values in its natural condition and that minimal development is a virtue. She encouraged keeping a small footprint for future land use planning. Ms. Barnard stated that she is also a visitor of Troy Spring and encouraged viewshed considerations when developing use areas around the basin. She stated that impervious pavement is hydrologically problematic and visually unattractive.

Jacqui Sulek (Four Rivers Audubon Society) noted from comments voiced during the public hearing that the UMPs are focused on lands within existing park boundaries, not the broader region. She urged managing agencies and local government jurisdictions to cooperate on reduction of offsite impacts. Ms. Sulek described observations of brown algae and the lack of river grass. She commented that turbid water conditions result from large numbers of visitors entering the river within short intervals. Ms. Sulek additionally noted that establishing minimum flow levels (MFL) does not serve to mitigate existing ecological damages. She advised that the presence or lack of manatees in the Ichetucknee River should influence MFL. She noted that loss of vegetation is partly the result of trampling, which most often occurs during low water periods, and the diminished resilience of aquatic plant species is attributable to consistently lower water supply. Ms. Sulek commented that the most significant threats to the resources in Florida's springs parks result from outside sources. She encouraged strengthening the language in the plans to call for community and inter-agency cooperation. Ms. Sulek offered the assistance of the Audubon chapter in developing interpretation of bird species at both Ichetucknee Springs and Troy Spring state parks. Regarding, the proposed boat mooring sites along the edge of the Suwannee River boundary at Troy Spring, Ms. Sulek stated that it would promote overnight use.

Bob Knight (Ichetucknee Alliance) commented that the plans for both parks include clear and detailed descriptions of their respective resources. Mr. Knight described the causal relationships between groundwater uptake, terrestrial nitrate and phosphate applications. He stated that the Ichetucknee River contains twice the allowable levels of nitrogen. He cited University of Florida studies indicating that low flow in the Ichetucknee River is a factor in algae growth. He stated that water velocity decreases with reduced average flow. Mr. Knight commented that the Ichetucknee River has experienced a loss of plant species diversity. He urged DEP to coordinate with the Suwannee River Water Management District regarding the Basin Management Action Plans (BMAP) to reduce offsite impacts to the springs parks. Regarding park operations, Mr. Knight commended the DRP for its internal management of Ichetucknee Springs State Park, but encouraged further studies to refine the park's ecological and recreational carrying capacity. Mr. Knight commented that nutrient content at Troy Spring is high and that most of its nitrogen content is received from agricultural run-off. He stated that a Middle Suwannee River watershed management plan is being developed.

William Stasiewicz (Florida Paddling Trails Association) commented that public access changes at Ichetucknee Springs State Park have not been convenient for paddlers and encouraged the DRP to consider paddling launch and landing facilities. Mr. Stasiewicz stated that there is a need for a formal paddling launch at Troy Spring with an accessible footpath leading to the launch point. He advised that some vegetation clearing may be required for a launch access. Mr. Stasiewicz stated that the park and local agencies should encourage visitation of the springs and river by paddling versus motorized watercraft. He noted the convenience of visiting Troy Spring as its location is particularly accessible from the Suwannee River and suggested that launching from the park would allow visitors to experience other springs within the vicinity.

Eva Bolton (Lafayette County 4-H) stated that she was appointed as a representative of recreational/educational user groups for Troy Springs, but also has family heritage related to Ichetucknee Springs as she is a direct descendent of the Dampiers. Ms. Bolton commented on the significant cultural history of Ichetucknee Springs. Ms. Bolton recognized the agricultural economic tradition and character of the greater springshed region and would like to work with the local community to introduce more of a conservation element, especially through the 4-H organization for which she is an instructor. Ms. Bolton inquired about the feasibility of offering reduced fees or park passes in exchange for volunteering or infrastructural donations to the parks. She encouraged finding ways to revitalize sense of personal investment in Troy Spring State Park among Lafayette County residents.

Paula Vann (Columbia County Tourist Development Council (TDC)) stated that the role of the TDC is to market the county's resources to encourage visitation. She stated that marketing is a form of education and can be developed specifically to broadly inform potential visitors about resources in the parks. Ms. Vann commented that the TDC has engaged in outreach in Fort White and offered to assist with park signage and marketing. She discussed the potential to emphasize ecologically responsible tourism.

Edwin McCook (Suwannee River Water Management District (SRWMD)) had no comments regarding land management for either Ichetucknee Springs or Troy Spring state parks. He encouraged linking the O'Leno and Suwannee River Greenway and enhancing access to Ichetucknee Springs by the shared-use path. Mr. McCook stated that he has coordinated legislative tours of the Ichetucknee River. He noted the positive responses he has observed on these tours. Mr. McCook discussed the optimum boundary as proposed in the Troy Spring UMP. He stated the SRWMD is currently working on access easements for equestrian use in the adjacent Troy Spring Conservation Area and has other acquisitions within the Troy Spring vicinity to consider.

Andy Jackson (Suwannee County Soil and Water Conservation District) stated that he is a lifelong Suwannee County resident and is highly familiar with the Ichetucknee, Santa Fe, and Suwannee rivers and regional watershed. He stated that having an agricultural background, he knows that the farming community strives to reduce impacts to the watershed. Mr. Jackson encouraged a cooperative approach to solving the springs protection issues and stated that youth will be critical to finding solutions.

Summary of Written Advisory Group Comments

Jason O'Donoughue (Division of Historical Resources (DHR)) identified discrepancies between cultural resource records listed in the Ichetucknee Springs State Park RMC and Florida Master Site File (FMSF), including Wayside Park, Dampier's Landing, Ichetucknee Railroad Crossing, and the McCormick Pole Barn. He noted that the Paleoindian period in Florida spans 11,500–9,500 B.C. and the Archaic period 9,500–1,500 B.C. and recommended revisions to a site description in the plan. Mr. O'Donoughue advised that eight surveys have taken place on or adjacent to the park since 2001. He concurred that a geoarchaeological assessment of the Ichetucknee Head Spring would be beneficial to guide restoration and avoid unnecessary impacts. He stated that Public Lands Archaeology has the specialized staff and a springs specialist who are available to assist, as are personnel from DHR's Underwater Archaeology program. He recommended additional treatment to stabilize the dugout canoe on display at the Ichetucknee Education and Exhibit Center. Mr. O'Donoughue also provided comments on the Troy Spring UMP. He advised that the CARL Archaeological Survey Investigations of 1996 were not exhaustive and examined only a small portion of the park. He offered that staff from DHR's Public Lands Archaeology program are available to conduct a preliminary cultural resources survey and provide management recommendations. He concurred that the disposition of the Madison "creates a valuable opportunity for interpretation of the site and the region's cultural history" and encouraged continuing efforts to educate visitors about the sensitivity of the Madison shipwreck. He recommended additional interpretive signage outlining the significance of the Madison and its protection under Florida law. He recommended that in addition to photo documentation, the DRP should record the dimensions of the vessel to track changes in exposure, erosion, or degradation.

Summary of Public Comments

Jim Stevenson discussed the balance between preservation and recreation and provided background on the management of visitor use in Florida state parks. He stated that he is unaware of any historical basis for the name “Saylor” Sink as prior to state acquisition in 2002, the Ichetucknee Springs Basin Working Group renamed this feature” Ichetucknee” Sink to raise public awareness about its relationship to Ichetucknee Springs. He recommended revising the name in the Ichetucknee Springs UMP. Mr. Stevenson stated that secondary use that should be restricted to former agricultural fields of planted pines and urged that oversight of contractors by the park manager and park biologist is required to ensure the highest level of sensitivity. Regarding the three power line easements across the Ichetucknee River, Mr. Stevenson encouraged that cutting of vegetation should be limited adjacent to the river to screen the cleared easements from view. He stated that this matter was negotiated by the state park director in 1971. Mr. Stevenson stated that the Ichetucknee Headspring had a long tradition of quiet local use, including baptisms, family reunions, and picnics, but that high visitation following the park’s opening as a park, reduced the serene character of the spring site. He recommended drawing visitor use downstream of the Headspring, such that tubers would enter at the midpoint. He stated that increased canoe and kayak concession rentals for use on the upper river would enhance revenue and reduce shuttling visitors from the south use area to the north use area to retrieve vehicles and also reduce the risk of accidents on adjacent county roads. Mr. Stevenson encouraged construction of a large picnic pavilion near the restroom and existing parking at the north use area to improve accommodation of group activities. He recommended careful attention to placement of the pavilion to not diminish the viewshed toward the Headspring.

Brack Barker commented that more consistent enforcement of park rules is needed. Mr. Barker recommended that access for paddlers be improved during tubing season. He recommended that the riparian zone, including up to 100 yards inland, along the river be designated an archaeological zone to increase protection from intrusive activities, citing the Mission site as an example of the importance of cultural resource protection due to the shallow depth that the church was found.

Staff Recommendations

- Language in the Imperiled Species section of the Ichetucknee Springs State Park UMP was revised to include current designations and monitoring protocols for brown-headed nuthatch, Santa Fe crayfish, Suwannee cooter, and Florida gopher frog.
- Reference to successful volunteer efforts to remove defacement of karst in the Blue Hole cavern was added to the Natural Communities section for Ichetucknee Springs State Park.
- Explanations of water level monitoring and visitor access guidelines for low water conditions were added to the Land Use Component for Ichetucknee Springs State Park.
- Operational and existing facilities descriptions were revised to reflect current usage in the Land Use Component for Ichetucknee Springs State Park.
- Descriptions of historic structures and archaeological sites were updated to reflect the most current cultural resource records for both Ichetucknee Springs and Troy Spring state parks.
- Language was added to the Cultural Resource Management section of the Troy Spring State Park UMP to call for additional monitoring and interpretation of the Madison archaeological site. The DRP will continue to work with DHR to ensure that artifacts are preserved and curated according to best practices.
- Additional revisions were made throughout the documents to address editorial corrections, consistency of spelling and notations, and other minor corrections.

Notes on Composition of the Advisory Group

Florida Statutes Chapter 259.032 Paragraph 10(b) establishes a requirement that all state land management plans for properties greater than 160 acres will be reviewed by an advisory group:

“Individual management plans required by s. 253.034(5), for parcels over 160 acres, shall be developed with input from an advisory group. Members of this advisory group shall include, at a minimum, representatives of the lead land managing agency, co-managing entities, local private property owners, the appropriate soil and water conservation district, a local conservation organization, and a local elected official.”

Advisory groups that are composed in compliance with these requirements complete the review of State park management plans. Additional members may be appointed to the groups, such as a representative of the park's Citizen Support Organization (if one exists), representatives of the recreational activities that exist in or are planned for the park, or representatives of any agency with an ownership interest in the property. Special issues or conditions that require a broader representation for adequate review of the management plan may require the appointment of additional members. The DRP's intent in making these appointments is to create a group that represents a balanced cross-section of the park's stakeholders. Decisions on appointments are made on a case-by-case basis by Division of Recreation and Parks staff.

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Addendum 4 – Soil Descriptions

COLUMBIA COUNTY

(**3) Alpin fine sand, 0 to 5 percent slopes** - This is an excessively drained, nearly level to gently sloping soil on broad, slightly elevated ridges. The major soil component contains 80 percent Alpin fine sand. Typically, the soil profile has fine sand to 80 inches. The parent material contains Eolian deposits or sandy marine deposits. The available water capacity is low (about 3.9 inches). The Alpin soil does not have a water table within a depth of 80 inches at any time. Included with this soil are small areas of Blanton, Lakeland, Chipley, and Albany soils. These soils make up about 20 percent of the map unit.

(4) Alpin fine sand, 5 to 12 percent slopes - This is an excessively drained, sloping to strongly sloping soil on side slopes of broad, slightly elevated ridges. The major soil component contains 85 percent Alpin fine sand. The typical soil profile has fine sand to a depth of 80 inches or more. The parent material contains Eolian deposits or sandy marine deposits. The available water capacity is low (about 3.7 inches). This Alpin soil does not have a water table within a depth of 80 inches at any time. The minor soil components, Blanton, Lakeland, Troup, Chipley, and Albany, make up 15 percent of this unit.

(7) Bigbee fine sand - This is a nearly level excessively drained soil on low terraces along rivers that are occasionally flooded. Eighty percent of this unit is Bigbee fine sand. The typical soil profile has fine sand to a depth of 80 inches. The parent material contains sandy fluviomarine deposits. The available water capacity is low (about 4.3 inches). The depth to the water table is about 42 to 72 inches. The minor soil components are occasionally flooded Electra variant, Alpin and Blanton soils. These make up about 15 percent of the map unit. The remaining 5 percent contains non-hydric Leon soil.

(8) Blanton fine sand, 0 to 5 percent slopes - This is a moderately well drained, nearly level to gently sloping soil on broad ridges and undulating side slopes. Blanton fine sand make up 85 percent of this unit. Typically, the surface and subsurface layers are fine sand to a depth of about 52 inches. The subsoil is a fine sandy loam that extends to a depth of 80 inches. The parent material contains sandy and loamy marine deposits. The available water capacity is low (about 3.6 inches). Depth to the water table ranges from 48 to 72 inches. Included with this soil in mapping are small areas of Albany, Alpin, Chipley, Lakeland, Ocilla, Troup, and Bonneau soils. These soils make up less than 15 percent of the map unit.

(11) Blanton-Bonneau-Ichetucknee complex, 2 to 5 percent slopes - This complex consists of nearly level to gently sloping soils on upland knolls and on broad, elevated, undulating karst landscapes. The major soil components contain Blanton (35 percent), Bonneau (25 percent), and Ichetucknee (15 percent). Some soils that make up this complex are as small

as one-quarter acre. These soils are in areas that are so small or so intermingled that it was not practical to map them separately.

The Blanton and Bonneau soils make up about 35 percent and 25 percent of this complex, respectively. The typical soil profile for these soils has fine sand in the surface and subsurface layers. The subsoil contains fine sandy loam and sandy clam loam. Sandy and loamy marine deposits make up the parent materials. These soils are moderately well drained. The available water capacity is low (3.6 to 5.9 inches). The depth to the water table is 42 to 72 inches.

The Ichetucknee soil makes up about 15 percent of the complex. Typically, the soil profile has fine sand to 13 inches, clay from 13 to 55 inches, and weathered bedrock from 55 to 59 inches. This soil is somewhat poorly drained. The available water capacity is moderate (about 7.2 inches). The water table lies at about 6 to 8 inches from the surface.

The minor soil components are Albany, Alpin, Chiefland, Pedro Variant, Chipley, Lakeland and Ocilla. These soils make up about 25 percent of the complex.

(13) Bonneau fine sand, 2 to 5 percent slopes - This is a moderately well drained, gently sloping soil on uplands and on knolls in the uplands. Bonneau fine sand occurs in 80 percent of this map unit. The typical soil profile has fine sand surface and subsurface layers about 27 inches thick. The subsoil is sandy clay loam. The parent materials contain sandy and loamy marine deposits. This soil is not subject to flooding. The available water capacity is low (about 5.9 inches). The depth to the water table is about 42 to 60 inches. The minor soil components are Luck, Ocilla, Blanton, Goldsboro, and Ichetucknee soils. These soils make up less than 20 percent of the map unit.

(14) Bonneau fine sand, 2 to 5 percent slopes - This is a moderately well drained, sloping soil on short hillsides in the uplands. The major soil component of this unit is Bonneau. The typical soil profile has fine sand to a depth of 22 inches. Sandy clay loam extends from a depth of 22 to 80 inches or more. The parent materials are sandy and loamy marine deposits. The available water capacity is moderate (about 6.2 inches). The depth to the water table is about 42 to 60 inches. The minor soil components, Ichetucknee, Ocilla, Goldsboro, and Lucy, make up less than 20 percent of the map unit.

(19) Chiefland-Pedro Variant complex, occasionally flooded - This complex consists of nearly level to sloping soils that are within 3 miles of rivers and creeks interspersed with numerous sinkholes. The Chiefland soils makes up about 41 percent of the complex. The Pedro Variant soils make up about 39 percent. The surface and subsurface layers are fine sand. They are underlain by about 3 inches of weathered bedrock. The Pedro Variant soil has unweathered bedrock at a depth of about 14 to 18 inches. The parent materials are sandy and loamy marine deposits over limestone. These soils are occasionally flooded from river overflow. The available water capacity is very

low. The soils have no water table within a depth of 80 inches. The minor soil components include 20 percent Albany, Lakeland, Alpin, Troup and Rock outcrop.

(22) Electra Variant fine sand, 0 to 5 percent slopes - This is a somewhat poorly drained, nearly level to gently sloping soil on low ridges adjacent to drainage ways and around swamps or depressions. Electra Variant soil makes up 80 percent of this unit. Typically, fine sand extends to a depth of 53 inches from the surface. A fine sandy loam extends from 53 to 80 inches. The parent materials are sandy and loamy marine deposits. The available water capacity is moderate (about 8.5 inches). This soil has a water table at a depth of 24 to 42 inches. Included in this map unit are small areas of Albany; Plummer, non-hydric; Mascotte; Sapelo; Leon, non-hydric; Hurricane and Pelham, non-hydric soils. These soils make up about 20 percent of the area.

(27) Ichetucknee fine sand, 2 to 5 percent slopes - This is somewhat poorly drained, gently sloping soil on small knolls and undulating terrain. Seventy-five percent of this unit consists of Ichetucknee fine sand. The typical profile has fine sand to a depth of 13 inches, clay from13 to 55 inches and weathered bedrock from 55 to 59 inches. The parent materials are sandy and clayey marine deposits over limestone. Available water capacity is moderate (about 7.2 inches). The depth to the water table is about 18 to 36 inches. Small areas of Bonneau and Goldsboro soils make up about 25 percent of the map unit.

(29) Lakeland fine sand, 0 to 5 percent slopes - This is an excessively drained, nearly level to gently sloping soil on broad, slightly elevated ridges. The majority of this unit, 90 percent, is Lakeland find sand soil. The typical soil profile has fine sand to a depth of 80 inches. The parent materials are Eolian or sandy marine deposits. Available water capacity is low (about 4.1 inches). The depth to the water table is greater than 80 inches. The minor soil components, 10 percent, are Alpin, Blanton, Troup and Chipley.

(30) Lakeland fine sand, 5 to 12 percent slopes - This is an excessively drained, sloping to strongly sloping soil on broad, slightly elevated ridges and around depressions. Lakeland fine sand makes up 90 percent of this unit. Typically, the profile consists of fine sand to a depth of 80 inches. The parent materials are Eolian or sandy marine deposits. The depth to the water table is greater than 80 inches. Available water capacity is low (about 3.9 inches). The minor soil components, Alpin, Blanton and Chipley, make up less than 10 percent of the map unit.

(52) Plummer fine sand, depressional - This is a nearly level, very poorly drained soil in depressions. Plummer fine sand occupies 85 percent of the unit. The typical profile contains fine sand in the surface and subsurface layer to about 57 inches. Sandy clay loam exists in the subsoil (57 to 75 inches). The parent materials are sandy and loamy marine deposits. Available water

capacity is moderate (about 6.8 inches). The water table sits on the surface. Surrency and Pelham soils make up about 15 percent of the map unit.

(53) Plummer fine sand, occasionally flooded - This is a poorly drained, nearly level soil on the flood plains or rivers and streams. Plummer, non-hydric makes up 60 percent of the unit. Plummer, hydric makes up 15 percent of the unit. Typically, the soil profile contains fine sand to 55 inches. The subsoil is sandy clay loam. This layer extends to a depth of 80 inches or more. The parent materials are sandy and loamy marine deposits. This soil is occasionally flooded. The available water capacity is moderate (about 6.9 inches). Depth to the water table is about 6 to 18 inches. Included with this soil in mapping are small areas of Mascotte, hydric; Pelham, hydric and Electra Variant soils. The included soils make up about 25 percent of the map unit.

(61) Udorthents, 0 to 2 percent slopes - These soils are near abandoned phosphate mining areas. They formed in refuse that was washed from the phosphate and limestone during mining operations. This soil makes up 95 percent of the unit. The typical soil profile is variable to 48 inches. Fine sand is found from 48 to 80 inches. The parent materials are altered marine deposits. The soil is well drained. Available water capacity is moderate (about 7.6 inches). The depth to the water table is about 24 to 48 inches. The minor soil components, Blanton, Alpin and Bonneau, make up less than 5 percent of the map unit.

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*Soils classification units denoted with an "S" correspond with Suwannee County.

(7S) Bigbee-Garcon-Meggett complex, occasionally flooded - This complex makes up 80 percent of the unit. The typical profile contains fine sand in the surface and subsurface layers. The subsoil layer is typically sandy loam and sandy clay. The parent materials are sandy, loamy, and clayey marine and fluvial sediments. This soil is occasionally flooded. The available water capacity is very low to low in the Bigbee and Garcon soils. Available water capacity is high in the Meggett soil. The depth to the water table ranges from 0 inches in the Garcon soil to 72 inches in the Bigbee soil. The remaining 10 percent of this map unit are Chipley and Blanton soils.

(29S) Alpin fine sand, 0 to 5 percent slopes - This map unit consists of 80 percent Alpin fine sand. Typically, the profile contains fine sand to 80 inches. The parent materials are sandy marine deposits. The soil is excessively drained. The available water capacity is very low. The depth to the water table is more than 6 feet. Blanton and Chipley soils make up the remaining 20 percent of this unit.

(38S) Alpin fine sand, 0 to 5 percent slopes, occasionally flooded - This unit consists of 91 percent Alpin fine sand. Typically, the profile contains fine sand to 80 inches. The parent materials are sandy marine deposits. The soil is occasionally flooded. The available water capacity is very low. The depth to

the water table is more than 6 feet. Blanton and Foxworth soils make up the remaining 19 percent of this unit.

(79S) Blanton fine sand, 0 to 5 percent slopes - This unit consists of 87 percent Blanton fine sand. Typically, the profile contains fine sand in the surface and subsurface layers to 41 inches. The subsoil contains sandy loam from 41 to 48 inches and sandy clay loam to 80 inches. The parent materials are sandy and loamy marine sediments. The soil is moderately well drained. The available water capacity is very low. The depth to the water table is 42 to 72 inches. The minor soil components, Albany and Alpin, make up 13 percent of the unit.

Addendum 5—Plant and Animal List

Common Name	*Scientific Name*	Primary Habitat Codes (for designated species)

LICHENS

.....	*Cheilolejeunea myriantha*
.....	*Cheilolejeunea rigidula*
.....	*Cololejeunea cardiocarpa*
.....	*Dumortiera hirsuta*
.....	*Frullania ericoides*
.....	*Frullania kunzei*
.....	*Frullania obcordata*
.....	*Lejeunea bermudiana*
.....	*Lejeunea cladogyna*
.....	*Lejeunea flava*
.....	*Lejeunea laetevirens*
.....	*Leucolejeunea unciloba*
.....	*Metzgeria furcata*
.....	*Plagiochila aspleniformis*
.....	*Plagiochila dubia*
.....	*Plagiochila floridana*
.....	*Plagiochila invisa*
.....	*Plagiochila miradorensis*
.....	*Porella pinnata*
.....	*Radula australis*
.....	*Rectolejeunea maxonii*
.....	*Rectolejeunea spiniloba*

BRYOPHYTES

.....	*Amblystegium varium*
.....	*Anomodon attenuatus*
.....	*Anomodon rostratus*
.....	*Atrichum angustatum*
.....	*Barbula agraria*
.....	*Barbula cancellata*
.....	*Brachythecium acuminatum*
.....	*Bryoandersonia illecebra*
.....	*Bryohaplocladium microphyllum*
.....	*Bryum pseudotriquetrum*
.....	*Clasmatodon parvulus*
.....	*Cryphaea glomerata*
.....	*Cyrto-hypnum minutulum*
.....	*Ditrichum pallidum*
.....	*Entodon seductrix*
.....	*Eurhynchium hians*
.....	*Fissidens garberi*
.....	*Fissidens bryoides*
.....	*Fissidens taxifolius*

***** **Non-native Species** **+ Extirpated**

Common Name	*Scientific Name*	Primary Habitat Codes (for designated species)
.....	*Forsstroemia trichomitria*	
.....	*Funaria hygrometrica*	
.....	*Hypnum lindbergii*	
.....	*Isopterygium tenerum*	
.....	*Leptodictyum riparium*	
.....	*Leskea australis*	
.....	*Leucobryum albidum*	
.....	*Leucodon julaceus*	
.....	*Luisierella barbula*	
.....	*Mnium cuspidatum*	
.....	*Philonotis gracillima*	
.....	*Platygyrium repens*	
.....	*Rhynchostegium serrulatum*	
.....	*Sematophyllum adnatum*	
.....	*Syrrhopodon incompletus*	
.....	*Syrrhopodon parasiticus*	
.....	*Thelia hirtella*	
.....	*Thuidium delicatulum*	
.....	*Weissia controversa*	
.....	*Weissia jamaicensis*	

PTERIDOPHYTES

Ebony spleenwort	*Asplenium platyneuron*	
Southern grape fern	*Botrychium biternatum*	
Rattlesnake fern	*Botrychium virginianum*	
Japanese climbing fern	*Lygodium japonicum* *	
Mariana maiden fern	*Macrothelypteris torresiana* *	
Cinnamon fern	*Osmunda cinnamomea*	
Royal fern	*Osmunda regalis* var. *spectabilis*	
Resurrection fern	*Pleopeltis michauxiana*	
Tailed bracken fern	*Pteridium aquilinum* var. *pseudocaudatum*	
Cretan brake	*Pteris cretica* *	
Chinese ladder-brake fern	*Pteris vittata* *	
Water spangles	*Salvinia minima* *	
Southern shield fern	*Thelypteris kunthii*	
Ovate marsh fern	*Thelypteris ovata*	
Marsh fern	*Thelypteris palustris* var. *pubescens*	
Netted chain fern	*Woodwardia areola*ta	
Virginia chain fern	*Woodwardia virginica*	

GYMNOSPERMS

Red cedar	*Juniperus virginiana*	
Shortleaf pine	*Pinus echinata*	

*** Non-native Species** **+ Extirpated**

Common Name	*Scientific Name*	Primary Habitat Codes (for designated species)
Slash pine	*Pinus elliottii*	
Spruce pine	*Pinus glabra*	
Longleaf pine	*Pinus palustris*	
Loblolly pine	*Pinus taeda*	
Pond cypress	*Taxodium ascendens*	
Bald cypress	*Taxodium distichum*	
Coontie	*Zamia integrifolia*	

ANGIOSPERMS

MONOCOTS

Meadow garlic	*Allium canadense*	
Bushy bluestem	*Andropogon glomeratus* var. *pumilus*	
Elliott's bluestem	*Andropogon gyrans*	
Splitbeard bluestem	*Andropogon ternarius*	
Broomsedge bluestem	*Andropogon virginicus*	
Green silkyscale	*Anthaenantia villosa*	
Nodding nixie	*Apteria aphylla*	
Green dragon	*Arisaema dracontium*	
Jack-in-the-pulpit	*Arisaema triphyllum*	
Big threeawn	*Aristida condensata*	
Woolysheath threeawn	*Aristida lanosa*	
Arrowfeather threeawn	*Aristida purpurascens*	
Wiregrass	*Aristida stricta*	
Switch cane	*Arundinaria gigantea*	
Australian beard grass	*Bothriochloa bladhii* *	
Rescue grass	*Bromus catharticus* *	
Water-grass	*Bulbostylis barbata* *	
Capillary hair sedge	*Bulbostylis ciliatifolia*	
Ware's hair sedge	*Bulbostylis warei*	
Pindo palm	*Butia capitata* *	
Longhair sedge	*Carex comosa*	
Sandy woods sedge	*Carex dasycarpa*	
Slender woodland sedge	*Carex digitalis*	
Gholson's sedge	*Carex gholsonii*	
Long's sedge	*Carex longii*	
Southern sandspur	*Cenchrus echinatus*	
Coastal sandspur	*Cenchrus spinifex*	
Slender woodoats	*Chasmanthium laxum*	
Shiny woodoats	*Chasmanthium nitidum*	
Jamaica swamp sawgrass	*Cladium jamaicense*	
Carolina jointtail grass	*Coelorachis cylindrica*	
Beaked panicum	*Coleataenia anceps*	
Redtop panicum	*Coleataenia rigidula*	

Common Name	*Scientific Name*	Primary Habitat Codes (for designated species)
Wild taro	*Colocasia esculenta* *	
Common dayflower	*Commelina diffusa* *	
Whitemouth dayflower	*Commelina erecta*	
Spring coralroot	*Corallorhiza wisteriana*	
Bermuda grass	*Cynodon dactylon* *	
Baldwin's flat sedge	*Cyperus croceus*	
Swamp flat sedge	*Cyperus distinctus*	
Wiry flat sedge	*Cyperus filiculmis*	
Fragrant flat sedge	*Cyperus odoratus*	
Pine barren flat sedge	*Cyperus ovatus*	
Plukenet's flat sedge	*Cyperus plukenetii*	
Manyspike flat sedge	*Cyperus polystachyos*	
Straw-colored flat sedge	*Cyperus strigosus*	
Tropical flat sedge	*Cyperus surinamensis*	
Four-angle flat sedge	*Cyperus tetragonus*	
Durban crowfoot grass	*Dactyloctenium aegyptium* *	
Needleleaf witch grass	*Dichanthelium aciculare*	
Bosc's witch grass	*Dichanthelium boscii*	
Variable witch grass	*Dichanthelium commutatum*	
Cypress witch grass	*Dichanthelium dichotomum*	
Openflower witch grass	*Dichanthelium laxiflorum*	
Egg-leaf witch grass	*Dichanthelium ovale*	
Southern crab grass	*Digitaria ciliaris*	
Shaggy crab grass	*Digitaria filiformis*	
White yam	*Dioscorea alata* *	
Florida yam	*Dioscorea floridana*	
Coastal cockspur	*Echinochloa walteri*	
Road-grass	*Eleocharis baldwinii*	
Indian goose grass	*Eleusine indica* *	
Green-fly orchid	*Epidendrum conopseum*	AF, FS
Feather love grass	*Eragrostis amabilis* *	
Elliott's love grass	*Eragrostis elliottii*	
Bigtop love grass	*Eragrostis hirsuta*	
Purple love grass	*Eragrostis spectabilis*	
Centipede grass	*Eremochloa ophiuroides* *	
Two-spike finger grass	*Eustachys floridana*	
Pinewoods finger grass	*Eustachys petraea*	
Dwarf umbrella sedge	*Fuirena pumila*	
Gladiolus	*Gladiolus* x *hortulanus* *	
Bearded skeleton grass	*Gymnopogon ambiguus*	
Longhorn false rein orchid	*Habenaria quinqueseta*	
Sweet tanglehead	*Heteropogon melanocarpus* *	
Spiked crested coralroot	*Hexalectris spicata*	UHF
Little barley	*Hordeum pusillum*	
Spring-run spider-lily	*Hymenocallis rotata*	
Common yellow star-grass	*Hypoxis curtissii*	

*** Non-native Species** **+ Extirpated**

Common Name	*Scientific Name*	Primary Habitat Codes (for designated species)
Cogongrass	*Imperata cylindrica* *	
Grassleaf rush	*Juncus marginatus*	
Bighead rush	*Juncus megacephalus*	
Warty panic grass	*Kellochloa verrucosa*	
Shortleaf spike sedge	*Kyllinga brevifolia* *	
Little duckweed	*Lemna obscura*	
Valdivia duckweed	*Lemna valdiviana*	
Monkey grass	*Liriope spicata* *	
Italian rye grass	*Lolium perenne* *	
Florida adder's-mouth orchid	*Malaxis spicata*	
False aloe	*Manfreda virginica* *	
Rose natal grass	*Melinis repens* *	
Hairawn muhly	*Muhlenbergia capillaris*	
Nakedstem dewflower	*Murdannia nudiflora*	
Southern waternymph	*Najas guadalupensis*	
Burmann's basketgrass	*Oplismenus burmannii* *	
Woods grass	*Oplismenus setarius*	
Fall panic grass	*Panicum dichotomiflorum*	
Maidencane	*Panicum hemitomon*	
Switchgrass	*Panicum virgatum*	
Florida paspalum	*Paspalum floridanum*	
Bahia grass	*Paspalum notatum* *	
Thin paspalum	*Paspalum setaceum*	
Vasey grass	*Paspalum urvillei* *	
Green arrow arum	*Peltandra virginica*	
Blackseed needle grass	*Piptochaetium avenaceum*	
Waterlettuce	*Pistia stratiotes* *	
Annual blue grass	*Poa annua* *	
Smooth Solomon's-seal	*Polygonatum biflorum*	
Hairy shadow witch	*Ponthieva racemosa*	
Giant orchid	*Pteroglossaspis ecristata*	SH
Star-rush whitetop	*Rhynchospora colorata*	
Short-bristle horned beak sedge	*Rhynchospora corniculata*	
Fascicled beak sedge	*Rhynchospora fascicularis*	
Gray's beak sedge	*Rhynchospora grayi*	
Sandy-field beak sedge	*Rhynchospora megalocarpa*	
Millet beak sedge	*Rhynchospora miliacea*	
Plumed beak sedge	*Rhynchospora plumosa*	
Dwarf palmetto	*Sabal minor*	
Cabbage palm	*Sabal palmetto*	
Silver plume grass	*Saccharum alopecuroides*	
American cupscale grass	*Sacciolepis striata*	
Threadleaf arrowhead	*Sagittaria filiformis*	
Spring-tape	*Sagittaria kurziana*	
Bull-tongue arrowhead	*Sagittaria lancifolia*	
Little bluestem	*Schizachyrium stoloniferum*	

*** Non-native Species** **+ Extirpated**

Common Name	*Scientific Name*	Primary Habitat Codes (for designated species)
Soft-stem bulrush	*Schoenoplectus tabernaemontani*	
Fringed nut-rush	*Scleria ciliata*	
Littlehead nutrush	*Scleria oligantha*	
Tall nutgrass	*Scleria triglomerata*	
Saw-palmetto	*Serenoa repens*	
Knotroot foxtail	*Setaria parviflora*	
Narrowleaf blueeyed-grass	*Sisyrinchium angustifolium*	
Nash's blueeyed-grass	*Sisyrinchium nashii*	
Annual blueeyed-grass	*Sisyrinchium rosulatum* *	
Ear-leaf greenbrier	*Smilax auriculata*	
Saw greenbrier	*Smilax bona-nox*	
Wild sarsaparilla	*Smilax glauca*	
Bamboo-vine	*Smilax laurifolia*	
Sarsaparilla vine	*Smilax pumila*	
Lanceleaf greenbrier	*Smilax smallii*	
Hogbrier	*Smilax tamnoides*	
Coral greenbrier	*Smilax walteri*	
Yellow Indian grass	*Sorghastrum nutans*	
Lopsided Indian grass	*Sorghastrum secundum*	
Johnson grass	*Sorghum halepense* *	
Longleaf wedgescale	*Sphenopholis filiformis*	
Prairie wedgescale	*Sphenopholis obtusata*	
Lace-lip ladies tresses	*Spiranthes laciniata*	UHF
Underwater orchid	*Spiranthes odorata*	
Lesser ladiestresses	*Spiranthes ovalis* var. *erostellata*	AF, FS
October ladies-tresses	*Spiranthes ovalis* var. *ovalis*	AF, FS
Ichetucknee ladies'-tresses	*Spiranthes triloba*	
Common duckweed	*Spirodela polyrhiza*	
Smut grass	*Sporobolus indicus* *	
Pineywoods dropseed	*Sporobolus junceus*	
Gaping panicum	*Steinchisma hians*	
Bartram's air plant	*Tillandsia bartramii*	
Ball-moss	*Tillandsia recurvata*	
Spanish-moss	*Tillandsia usneoides*	
Crane-fly orchid	*Tipularia discolor* +	UMW
Small-leaf spiderwort	*Tradescantia fluminensis* *+	
Bluejacket	*Tradescantia ohiensis*	
Oyster-plant	*Tradescantia spathacea* *+	
Carolina fluff grass	*Tridens carolinianus*	
Tall redtop	*Tridens flavus*	
Spotted wake robin	*Trillium maculatum*	
Three-birds orchid	*Triphora trianthophoros*	UHF
Perennial sand grass	*Triplasis americana*	
Purple sand grass	*Triplasis purpurea*	
Broad-leaf cattail	*Typha latifolia*	
Browntop millet	*Urochloa ramosa* *	

*** Non-native Species** **+ Extirpated**

Common Name	*Scientific Name*	Primary Habitat Codes (for designated species)
Tape-grass	*Vallisneria americana*	
Squirreltail fescue	*Vulpia elliotea*	
Sixweeks fescue	*Vulpia octoflora*	
Columbian water meal	*Wolffia columbiana*	
Spanish bayonet	*Yucca aloifolia* *	
Adam's needle	*Yucca filamentosa*	
Rain lily	*Zephryanthes atamasca*	UHF
Lawn orchid	*Zeuxine strateumatica* *	
Annual wild rice	*Zizania aquatica*	

DICOTS

Three-seeded mercury	*Acalypha gracilens*	
Box-elder	*Acer negundo*	
Red maple	*Acer rubrum*	
Florida maple	*Acer saccharum* subsp. *floridanum*	
Opposite-leaf spotflower	*Acmella oppositifolia* var. *repens*	
Sticky joint-vetch	*Aeschynomene viscidula*	
Red buckeye	*Aesculus pavia*	
Pineland false-foxglove	*Agalinis divaricata*	
Beach false-foxglove	*Agalinis fasciculata*	
Slenderleaf false foxglove	*Agalinis tenuifolia*	
Hammock snakeroot	*Ageratina jucunda*	
Harvest-lice	*Agrimonia incisa*	SH
Small-fruit agrimony	*Agrimonia microcarpa*	
Mimosa	*Albizia julibrissin* *	
Tung-oil tree	*Aleurites fordii* *	
Alligator weed	*Alternanthera philoxeroides* *	
False moneywort	*Alysicarpus ovalifolius* *	
Pigweed	*Amaranthus hybridus*	
Common ragweed	*Ambrosia artemisiifolia*	
Bastrad false indigo	*Amorpha fruticosa*	
Pepper vine	*Ampelopsis arborea*	
American hog peanut	*Amphicarpaea bracteata*	
Texas madeira vine	*Anredera vesicaria* *	
Ground nut	*Apios americana*	
Devil's walking stick	*Aralia spinosa*	
Coral ardisia	*Ardisia crenata* *	
Thyme-leaved sandwort	*Arenaria serypyllifolia* *	
Bluestem pricklypoppy	*Argemone albiflora*	
Virginia snakeroot	*Aristolochia serpentaria*	
Florida Indian-plantain	*Arnoglossum floridanum*	
Clasping milkweed	*Asclepias amplexicaulis*	
Carolina milkweed	*Asclepias cinerea*	
Pinewoods milkweed	*Asclepias humistrata*	
Swamp milkweed	*Asclepias perennis*	

Common Name	*Scientific Name*	Primary Habitat Codes (for designated species)
Velvet-leaf milkweed	*Asclepias tomentosa*	
Butterfly weed	*Asclepias tuberosa*	
Whorled-leaf milkweed	*Asclepias verticillata*	
Showy milkwort	*Asemeia violacea*	
Slim-leaf pawpaw	*Asimina angustifolia*	
Wooly pawpaw	*Asimina incana*	
Smalflower pawpaw	*Asimina parviflora*	
Florida milk vetch	*Astragalus obcordatus*	
Bearded milk vetch	*Astragalus villosus*	
Fernleaf yellow false foxglove	*Aureolaria pectinata*	
Sea-myrtle	*Baccharis halimifolia*	
Herb-of-grace	*Bacopa monnieri*	
Coastal plain honeycomb-head	*Balduina angustifolia*	
Pineland wild indigo	*Baptisia lecontei*	
Rattan vine	*Berchemia scandens*	
Soft greeneyes	*Berlandiera pumila*	
Beggar-ticks	*Bidens alba*	
Spanish needles	*Bidens bipinnata*	
Smooth beggar-ticks	*Bidens laevis*	
Cross vine	*Bignonia capreolata*	
Bog hemp	*Boehmeria cylindrica*	
Wineflower	*Boerhavia diffusa*	
False boneset	*Brickellia eupatorioides*	
American bluehearts	*Buchnera americana*	
American beautyberry	*Callicarpa americana*	
Virginia ground-cherry	*Calliphysalis virginiana*	
Eastern sweetshrub	*Calycanthus floridus*	SH, UMW
Florida bellflower	*Campanula floridana*	
Trumpet-creeper	*Campsis radicans*	
Bitter mint	*Cantinoa mutabilis* *	
Shepherd's purse	*Capsella bursa-pastoris* *	
Hairy bitter-cress	*Cardamine hirsute* *	
Coastalplain chaffhead	*Carphephorus corymbosus*	
American hornbeam	*Carpinus caroliniana*	
Water hickory	*Carya aquatica*	
Pignut hickory	*Carya glabra*	
Pecan	*Carya illinoinensis* *	
Mockernut hickory	*Carya tomentosa*	
Chinquapin	*Castanea pumila*	
New Jersey-tea	*Ceanothus americanus*	
Sugarberry	*Celtis laevigata*	
Spadeleaf	*Centella asiatica*	
Spurred butterfly pea	*Centrosema virginianum*	
Common buttonbush	*Cephalanthus occidentalis*	
Mouse-ear chickweed	*Cerastium glomeratum* *	
Coontail	*Ceratophyllum demersum*	

*** Non-native Species** **+ Extirpated**

Common Name	***Scientific Name***	**Primary Habitat Codes (for designated species)**
Eastern redbud	*Cercis canadensis*	
Hairy-fruti chervil	*Chaerophyllum tainturieri*	
Partridge pea	*Chamaecrista fasciculata*	
Sensitive pea	*Chamaecrista nictitans*	
Pill-pod sandmat	*Chamaesyce hirta*	
Hyssop-leaf sandmat	*Chamaesyce hyssopifolia*	
Spotted sandmat	*Chamaesyce maculata*	
Lamb's-quarters	*Chenopodium album*	
White Fringe tree	*Chionanthus virginicus*	
Cottony golden aster	*Chrysopsis gossypina*	
Spotted water hemlock	*Cicuta maculata*	
Camphor tree	*Cinnamomum camphora* *	
Purple thistle	*Cirsium horridulum*	
Nuttall's thistle	*Cirsium nuttallii*	
Watermelon	*Citrullus lanatus* *	
Sour orange	*Citrus* x *aurantium* *	
Lemon	*Citrus* x *limon* *	
Swamp leatherflower	*Clematis crispa*	
Net-leaf leatherflower	*Clematis reticulata*	
Turk's-turban	*Clerodendrum indicum* *+	
Browne's savory	*Clinopodium brownei*	
Atlantic pigeon-wings	*Clitoria mariana*	
Tread softly	*Cnidoscolus stimulosus*	
Carolina coralbead	*Cocculus carolinus*	
Blue mistflower	*Conoclinium coelestinum*	
American squawroot	*Conopholis americana*	
Canadian horseweed	*Conyza canadensis*	
Golden-mane tickseed	*Coreopsis basalis* *	
Leavenworth's tickseed	*Coreopsis leavenworthii*	
Rough-leaf dogwood	*Cornus asperifolia*	
Flowering dogwood	*Cornus florida*	
Swamp dogwood	*Cornus foemina*	
Harlequin	*Corydalis micrantha* subsp. *australis*	
Yellowleaf hawthorn	*Crataegus flava*	
Michaux's hawthorn	*Crataegus michauxii*	
Dwarf-thorn	*Crataegus uniflora*	
Green hawthorn	*Crataegus viridus*	
Carolina frostweed	*Crocanthemum carolinianum*	
Pine-barren frostweed	*Crocanthemum corymbosum*	
Slender scratch daisy	*Croptilon divaricatum*	
Lance-leaf rattlebox	*Crotalaria lanceolata* *	
Smooth rattlebox	*Crotalaria pallida* var. *obovata* *	
Rabbit-bells	*Crotalaria rotundifolia*	
Showy rattlebox	*Crotalaria spectabilis* *	
Silver croton	*Croton argyranthemus*	
Wooly croton	*Croton capitatus*	

*** Non-native Species** **+ Extirpated**

Common Name	*Scientific Name*	Primary Habitat Codes (for designated species)
Vente conmigo	*Croton glandulosus*	
Rushfoil	*Croton michauxii*	
Five-angled dodder	*Cuscuta pentagona*	
Marsh parsley	*Cyclospermum leptophyllum* *	
Whitetassels	*Dalea carnea* var. *albida*	
Summer farewell	*Dalea pinnata*	
American wild carrot	*Daucus pusillus*	
Climbing hydrangea	*Decumaria barbara*	
Western tansy-mustard	*Descurainia pinnata*	
Hoary tick-trefoil	*Desmodium canescens*	
Hairy small-leaf tick-trefoil	*Desmodium ciliare*	
Florida tick-trefoil	*Desmodium floridanum*	
Dillenius' tick-trefoil	*Desmodium glabellum*	
Zarabacoa comun	*Desmodium incanum*	
Smooth tick-clover	*Desmodium laevigatum*	
Sand tick-trefoil	*Desmodium lineatum*	
Pine barren tick-trefoil	*Desmodium strictum*	
Slimleaf tick-trefoil	*Desmodium tenuifolium*	
Dixie tick-treefoil	*Desmodium tortuosum* *	
Three-flower tick-trefoil	*Desmodium triflorum* *	
Carolina pony's-foot	*Dichondra carolinensis*	
Poor Joe	*Diodia teres*	
Virginia buttonweed	*Diodia virginiana*	
Common persimmon	*Diospyros virginiana*	
West Indian chickweed	*Drymaria cordata*	
Oblong-leaf twinflower	*Dyschoriste oblongifolia*	
Mexican-tea	*Dysphania ambrosioides* *	
Carolina elephant's-foot	*Elephantopus carolinianus*	
Tall elephant's-foot	*Elephantopus elatus*	
Florida tasselflower	*Emilia fosbergii* *	
Fireweed	*Erechtites hieracifolia*	
Oakleaf fleabane	*Erigeron quercifolius*	
Prairie fleabane	*Erigeron strigosus*	
Loquat	*Eriobotrya japonica* *+	
Dog-tongue wild buckwheat	*Eriogonum tomentosum*	
Baldwin's eryngo	*Eryngium baldwinii*	
Cherokee bean	*Erythrina herbacea*	
American strawberry bush	*Euonymus americanus*	
White thoroughwort	*Eupatorium album*	
Dog fennel	*Eupatorium capillifolium*	
Yankeeweed	*Eupatorium compositifolium*	
Waxy thoroughwort	*Eupatorium linearifolium*	
Roundleaf thoroughwort	*Eupatorium rotundifolium*	
Late-flowering thoroughwort	*Eupatorium serotinum*	
Coastal sand spurge	*Euphorbia exserta*	
Graceful sandmat	*Euphorbia hypericifolia*	

*** Non-native Species** **+ Extirpated**

Common Name	*Scientific Name*	Primary Habitat Codes (for designated species)
Flat-topped goldenrod	*Euthamia caroliniana*	
Eastern swamp privet	*Forestiera acuminata*	
Carolina buckthorn	*Frangula caroliniana*	
White ash	*Fraxinus americana*	
Pop ash	*Fraxinus caroliniana*	
Pumpkin ash	*Fraxinus pennsylvanica*	
Cottonweed	*Froelichia floridana*	
Lance-leaf blanket flower	*Gaillardia aestivalis*	
Firewheel	*Gaillardia pulchella*	
Elliott's milkpea	*Galactia elliottii*	
Eastern milkpea	*Galactia mollis*	
Soft milk-pea	*Galactia regularis*	
Downy milkpea	*Galactia volubilis*	
Spring cleavers	*Galium aparine*	
Coastal bedstraw	*Galium hispidulum*	
Hairy bedstraw	*Galium pilosum*	
Stiff marsh bedstraw	*Galium tinctorium*	
One-flower bedstraw	*Galium uniflorum*	
Caribbean purple everlasting	*Gamochaeta antillana*	
American everlasting	*Gamochaeta coarctata*	
Pennsylvania everlasting	*Gamochaeta pensylvanica*	
Spoon-leaf purple everlasting	*Gamochaeta purpurea*	
Dwarf huckleberry	*Gaylussacia dumosa*	
Yellow jessamine	*Gelsemium sempervirens*	
Gopher apple	*Geobalanus oblongifolius*	
Carolina cranesbill	*Geranium carolinianum*	
Rose mock-vervain	*Glandularia canadensis*	
Moss verbena	*Glandularia aristigera* *	
Angular-fruit milkvine	*Gonolobus suberosus*	UHF
American witch-hazel	*Hamamelis virginiana*	
English ivy	*Hedera helix* *	
Paleleaf woodland sunflower	*Helianthus strumosus*	
Clasping heliotrope	*Heliotropium amplexicaule* *	
Camphor weed	*Heterotheca subaxillaris*	
Comfort-root	*Hibiscus aculeatus*	
Queendevil	*Hieracium gronovii*	
Coastal plain hawkweed	*Hieracium megacephalon*	
Innocence	*Houstonia procumbens*	
Floating marsh pennywort	*Hydrocotyle ranunculoides*	
Many-flower marsh pennywort	*Hydrocotyle umbellata*	
Whorled marsh pennywort	*Hydrocotyle verticillata*	
Old plainsman	*Hymenopappus scabiosaeus*	
Pineweeds	*Hypericum gentianoides*	
St. Andrew's-cross	*Hypericum hypericoides*	
Dwarf St. John's-wort	*Hypericum mutilum*	
Four-petal St. Johns's-wort	*Hypericum tetrapetalum*	

Common Name	*Scientific Name*	Primary Habitat Codes (for designated species)
Sand holly	*Ilex ambigua*	
Dahoon	*Ilex cassine*	
Large gallberry	*Ilex coriacea*	
Possum haw	*Ilex decidua*	
Gallberry	*Ilex glabra*	
American holly	*Ilex opaca*	
Yaupon	*Ilex vomitoria*	
Carolina indigo	*Indigofera caroliniana*	
Hairy indigo	*Indigofera hirsuta* *	
Trailing indigo	*Indigofera spicata* *	
Tievine	*Ipomoea cordatotriloba*	
Scarlet creeper	*Ipomoea hederifolia*	
Ocean-blue morning-glory	*Ipomoea indica*	
Large-root morning-glory	*Ipomoea macrorhiza* *	
Cypress-vine	*Ipomoea quamoclit* *	
Man-of-the-earth	*Ipomoea pandurata*	
Littlebell	*Ipomoea triloba* *	
Standing-cypress	*Ipomopsis rubra*	
Virginia-willow	*Itea virginica*	
Looseflower water-willow	*Justicia ovata*	
Sandspur	*Krameria lanceolata*	
Virginia dwarf dandelion	*Krigia virginica*	
Japanese clover	*Kummerowia striata* *	
Canada lettuce	*Lactuca canadensis*	
Woodland lettuce	*Lactuca floridana*	
Grass-leaf lettuce	*Lactuca graminifolia*	
Crepe-myrtle	*Lagerstroemia indica* *	
Henbit deadnettle	*Lamium amplexicaule* *	
Shrub verbena	*Lantana strigocamara* *+	
Thyme-leaf pinweed	*Lechea minor*	
Hairy pinweed	*Lechea mucronata*	
Lesser swinecress	*Lepidium didymum* *	
Virginia pepperweed	*Lepidium virginicum*	
Hairy lespedeza	*Lespedeza hirta*	
Creeping lespedeza	*Lespedeza repens*	
Tall lespedeza	*Lespedeza stuevei*	
Pinscale gayfeather	*Liatris elegans*	
Short-leaf gayfeather	*Liatris tenuifolia*	
Glossy privet	*Ligustrum lucidum* *	
Chinese privet	*Ligustrum sinense* *	
Canadian toadflax	*Linaria canadensis*	
Moistbank pimpernel	*Lindernia dubia*	
Sweetgum	*Liquidambar styraciflua*	
Tuberous gromwell	*Lithospermum tuberosum*	
False gromwell	*Lithospermum virginianum*	
Cardinalflower	*Lobelia cardinalis*	FS

*** Non-native Species** **+ Extirpated**

Common Name	*Scientific Name*	Primary Habitat Codes (for designated species)
Downy lobelia	*Lobelia puberula*	
Japanese honeysuckle	*Lonicera japonica* *+	
Coral honeysuckle	*Lonicera sempervirens*	
Yerba de jicotea	*Ludwigia erecta*	
Seaside primrosewillow	*Ludwigia maritima*	
Mexican primrosewillow	*Ludwigia octovalvis*	
Creeping primrosewillow	*Ludwigia repens*	
Sundial lupine	*Lupinus perennis*	
Lady lupine	*Lupinus villosus*	
Roserush	*Lygodesmia aphylla*	
Fetterbush	*Lyonia lucida*	
Southern magnolia	*Magnolia grandiflora*	
Sweet bay	*Magnolia virginiana*	
Florida milkvine	*Matelea floridana*	UMW
Trailing milkvine	*Matelea pubiflora*	SH
Axil-flower	*Mecardonia acuminata*	
Black medic	*Medicago lupulina* *	
Snow squarestem	*Melanthera nivea*	
Chinaberry tree	*Melia azedarach* *	
White sweet-clover	*Melilotus albus* *	
Hairy melochia	*Melochia spicata*	
Creeping cucumber	*Melothria pendula*	
Noyau vine	*Merremia dissecta* *	
Shade mudflower	*Micranthemum umbrosum*	
Florida Keys hempvine	*Mikania cordifolia*	
Climbing hempweed	*Mikania scandens*	
Sensitive brier	*Mimosa quadrivalvis* var. *angustata*	
Powderpuff	*Mimosa strigillosa*	
Partridge berry	*Mitchella repens*	
Lax hornpod	*Mitreola petiolata*	
Indian chickweed	*Mollugo verticillata* *	
Spotted beebalm	*Monarda punctata*	
Indian pipe	*Monotropa uniflora*	
Wax-myrtle	*Morella cerifera*	
Red mulberry	*Morus rubra*	
Two-leaf water-milfoil	*Myriophyllum heterophyllum*	
Cut-leaf water-milfoil	*Myriophyllum pinnatum*	
Heavenly-bamboo	*Nandina domestica* *	
Florida watercress	*Nasturtium floridanum*	
European watercress	*Nasturtium officinale* *	
Spatterdock	*Nuphar advena*	
Swamp tupelo	*Nyssa sylvatica* var. *biflora*	
Black gum	*Nyssa sylvatica*	
Weedy evening-primrose	*Oenothera biennis*	
Cut-leaved evening-primrose	*Oenothera laciniata*	
Southern beeblossom	*Oenothera simulans*	

*** Non-native Species** **+ Extirpated**

Common Name	***Scientific Name***	**Primary Habitat Codes (for designated species)**
Flat-top mille graines	*Oldenlandia corymbosa* *	
Clustered mille graines	*Oldenlandia uniflora*	
Prickly-pear cactus	*Opuntia humifusa*	
Piedmont leatherroot	*Orbexilum lupinellus*	
Wild olive	*Cartrema americana*	
Eastern hophornbeam	*Ostrya virginiana*	
Common yellow wood-sorrel	*Oxalis corniculata*	
Pink wood-sorrel	*Oxalis debilis*	
Small's ragwort	*Packera anonyma*	
Butterweed	*Packera glabella*	
Coastal plain palafox	*Palafoxia integrifolia*	
American whitlow-wort	*Paronychia americana*	
Baldwin's nailwort	*Paronychia baldwinii*	
Rugel's nailwort	*Paronychia rugelii*	
Virginia creeper	*Parthenocissus quinquefolia*	
Purple passionflower	*Passiflora incarnata*	
Yellow passionflower	*Passiflora lutea*	
Spreading cinchweed	*Pectis prostrata*	
Buckroot	*Pediomelum canescens*	
Eustis lake beard-tongue	*Penstemon australis*	
Hale's pentodon	*Pentodon pentandrus*	
Red bay	*Persea borbonia*	
Swamp bay	*Persea palustris*	
Dotted smartweed	*Persicaria punctata*	
Bog smartweed	*Persicaria setacea*	
Jumpseed	*Persicaria virginiana*	
Petunia	*Petunia* x *atkinsiana* *	
Thicket bean	*Phaseolus polystachios*	
Thicket bean	*Phaseolus polystachios* var. *sinuatus*	
Annual garden phlox	*Phlox drummondii* *	
Downy phlox	*Phlox pilosa*	
Oak mistletoe	*Phoradendron leucarpum*	
Turkey-tangle fogfruit	*Phyla nodiflora*	
Mascarene Island leaf-flower	*Phyllanthus tenellus* *	
Chamber bitter	*Phyllanthus urinaria* *	
Cypress-head ground-cherry	*Physalis arenicola*	
Carpenter's ground-cherry	*Physalis carpenteri*	
Slender-leaf dragon-head	*Physostegia leptophylla*	
American pokeweed	*Phytolacca americana*	
Artillery plant	*Pilea microphylla*	
Pitted stripeseed	*Piriqueta cistoides* subsp. *caroliniana*	
Narrowleaf silk-grass	*Pityopsis graminifolia*	
Southern plantain	*Plantago virginica*	
Camphorweed	*Pluchea camphorata*	
Fiddler's spurge	*Poinsettia heterophylla*	
Georgia milkwort	*Polygala leptostachys*	

*** Non-native Species** **+ Extirpated**

Common Name	*Scientific Name*	Primary Habitat Codes (for designated species)
Tall jointweed	*Polygonella gracilis*	
Sandhill wireweed	*Polygonella robusta*	
Rustweed	*Polypremum procumbens*	
Paraguayan purslane	*Portulaca amilis* *	
Cherry laurel	*Prunus caroliniana*	
Black cherry	*Prunus serotina*	
Hog plum	*Prunus umbellata*	
Sweet everlasting	*Pseudognaphalium obtusifolium*	
Wafer ash	*Ptelea trifoliata*	
Blackroot	*Pterocaulon pycnostachyum*	
Mock bishop's-weed	*Ptilimnium capillaceum*	
Carolina desert chicory	*Pyrrhopappus carolinianus*	
Bastard white oak	*Quercus austrina*	
Southern red oak	*Quercus falcata*	
Sand live oak	*Quercus geminata*	
Blue-jack oak	*Quercus incana*	
Turkey oak	*Quercus laevis*	
Laurel oak	*Quercus laurifolia*	
Overcup oak	*Quercus lyrata*	
Sand post oak	*Quercus margaretta*	
Swamp chestnut oak	*Quercus michauxii*	
Water oak	*Quercus nigra*	
Shumard's oak	*Quercus shumardii*	
Live oak	*Quercus virginiana*	
Wild radish	*Raphanus raphanistrum* *	
Pale meadow beauty	*Rhexia mariana*	
Winged sumac	*Rhus copallinum*	
Double-form snout bean	*Rhynchosia difformis*	
Least snout bean	*Rhynchosia minima*	
Dollarleaf	*Rhynchosia reniformis*	
Twining snout bean	*Rhynchosia tomentosa* var. *mollissima*	
Twining snout bean	*Rhynchosia tomentosa* var. *tomentosa*	
Tropical Mexican clover	*Richardia brasiliensis* *	
Largeflower Mexican clover	*Richardia grandiflora* *	
Rough Mexican clover	*Richardia scabra* *	
Swamp rose	*Rosa palustris*	
Sawtooth blackberry	*Rubus pensilvanicus*	
Sand blackberry	*Rubus cuneifolius*	
Southern dewberry	*Rubus trivialis*	
Black-eyed Susan	*Rudbeckia hirta*	
Sandhill coneflower	*Rudbeckia mollis*	
Carolina wild petunia	*Ruellia caroliniensis*	
Hastate-leaved dock	*Rumex hastatulus*	
Coastal rose-gentian	*Sabatia calycina*	
Small-flower mock buckthorn	*Sageretia minutiflora*	
Carolina willow	*Salix caroliniana*	

*** Non-native Species** **+ Extirpated**

Common Name	*Scientific Name*	Primary Habitat Codes (for designated species)
Florida willow	*Salix floridana* +	FM
Azure blue sage	*Salvia azurea*	
Lyre-leaved sage	*Salvia lyrata*	
Elderberry	*Sambucus nigra* subsp. *canadensis*	
Pineland pimpernel	*Samolus valerandi* subsp. *parviflorus*	
Snakeroot	*Sanicula canadensis*	
Soapberry	*Sapindus saponaria*	
Sassafras	*Sassafras albidum*	
Florida scrub skullcap	*Scutellaria arenicola*	
Hairy skullcap	*Scutellaria elliptica*	
Small's skullcap	*Scutellaria multiglandulosa*	
Sicklepod	*Senna obtusifolia* *	
Septicweed	*Senna occidentalis* *	
Whitetop aster	*Sericocarpus tortifolius*	
Bladderpod	*Sesbania vesicaria*	
Piedmont black-senna	*Seymeria pectinata*	
Elliott's fanpetals	*Sida elliottii*	
Cuban jute	*Sida rhombifolia*	
Common wireweed	*Sida ulmifolia*	
Gum bully	*Sideroxylon lanuginosum*	
Florida bully	*Sideroxylon reclinatum*	
Rufous Florida bully	*Sideroxylon rufohirtum*	
Sleepy catchfly	*Silene antirrhina*	
Hairy leafcup	*Smallanthus uvedalia*	
American black nightshade	*Solanum americanum*	
Soda-apple	*Solanum capsicoides* *	
Carolina horse-nettle	*Solanum carolinense*	
Carolina goldenrod	*Solidago arguta* var. *caroliniana*	
Canada goldenrod	*Solidago canadensis* var. *scabra*	
Giant goldenrod	*Solidago gigantea*	
Chapman's goldenrod	*Solidago odora* var. *chapmanii*	
Downy ragged goldenrod	*Solidago petiolaris*	
Wand goldenrod	*Solidago stricta*	
Twisted-leaf goldenrod	*Solidago tortifolia*	
Spiny sow-thistle	*Sonchus asper* *	
Common sow thistle	*Sonchus oleraceus* *	
Prostrate false buttonweed	*Spermacoce prostrata*	
Rough-fruit scaleseed	*Spermolepis divaricata*	
Bristly scaleseed	*Spermolepis echinata*	
Florida betony	*Stachys floridana*	
Common chickweed	*Stellaria media* *	
Queen's delight	*Stillingia sylvatica*	
Pink fuzzy bean	*Strophostyles umbellata*	
Coastal plain dawnflower	*Stylisma patens*	
Side-beak pencilflower	*Stylosanthes biflora*	
Scale leaf aster	*Symphyotrichum adnatum*	

*** Non-native Species** **+ Extirpated**

Common Name	***Scientific Name***	**Primary Habitat Codes (for designated species)**
Climbing aster	*Symphyotrichum carolinianum*	
Eastern silver aster	*Symphyotrichum concolor*	
Rice-button aster	*Symphyotrichum dumosum*	
Calico aster	*Symphyotrichum lateriflorum*	
Wavy-leaf aster	*Symphyotrichum undulatum*	
Floirda hoary pea	*Tephrosia florida*	
Spiked hoary-pea	*Tephrosia spicata*	
Pineland nerve-ray	*Tetragonotheca helianthoides*	
Wood sage	*Teucrium canadense*	
Carolina basswood	*Tilia americana* var. *caroliniana*	
Malaysian false pimpernel	*Torenia crustacea* *	
Eastern poison oak	*Toxicodendron pubescens*	
Eastern poison ivy	*Toxicodendron radicans*	
Confederate jasmine	*Trachelospermum jasminoides* *	
Wavy-leaf noseburn	*Tragia urens*	
Nettleleaf noseburn	*Tragia urticifolia*	
Chinese tallow tree	*Triadica sebifera* *	
Forked blue curls	*Trichostema dichotomum*	
Coatbuttons	*Tridax procumbens* *	
Hop clover	*Trifolium campestre* *	
Carolina clover	*Trifolium carolinianum*	
White clover	*Trifolium repens* *	
Small Venus' looking-glass	*Triodanis biflora*	
Clasping Venus' looking-glass	*Triodanis perfoliata*	
Winged elm	*Ulmus alata*	
American elm	*Ulmus americana*	
Heartleaf nettle	*Urtica chamaedryoides*	
Sparkleberry	*Vaccinium arboreum*	
Highbush blueberry	*Vaccinium corymbosum*	
Darrow's blueberry	*Vaccinium darrowii*	
Shiny blueberry	*Vaccinium myrsinites*	
Deerberry	*Vaccinium stamineum*	
Beaked Corn salad	*Valerianella radiata*	
Wand mullein	*Verbascum virgatum* *	
Carolina vervain	*Verbena carnea*	
Texas vervain	*Verbena halei*	
Purpletop vervain	*Verbena incompta* *	
Sandpaper vervain	*Verbena scabra*	
Tall ironweed	*Vernonia angustifolia*	
Giant ironweed	*Vernonia gigantea*	
Corn speedwell	*Veronica arvensis* *	
Walter's viburnum	*Viburnum obovatum*	
Rusty black-haw	*Viburnum rufidulum*	
Florida vetch	*Vicia floridana*	
Common vetch	*Vicia sativa* *	
Early blue violet	*Viola palmata*	

*** Non-native Species** **+ Extirpated**

Common Name	***Scientific Name***	**Primary Habitat Codes (for designated species)**
Common blue violet	*Viola sororia*	
Prostrate blue violet	*Viola walteri*	
Summer grape	*Vitis aestivalis*	
Florida grape	*Vitis cinerea* var. *floridana*	
Catbird grape	*Vitis palmata*	
Muscadine grape	*Vitis rotundifolia*	
Frost grape	*Vitis vulpina*	
Southern rockbell	*Wahlenbergia marginata* *	
Chinese wisteria	*Wisteria sinensis* *	
Oriental hawk's-beard	*Youngia japonica* *	
Hercules'-club	*Zanthoxylum clava-herculis*	
Golden Alexanders	*Zizia aurea*	

*** Non-native Species** **+ Extirpated**

Common Name	*Scientific Name*	Primary Habitat Codes (for all species)

INVERTEBRATES

Crustaceans

Fontal Dwarf Crayfish	*Cambarellus schmitti*	SRST
Hobbs' Cave Amphipod	*Crangonyx hobbsi*	SRST
Amphipod	*Gammarus* sp.	SRST
Amphipod	*Hyalella* sp.	SRST
Grass Shrimp	*Palaemonetes paludosus*	SRST
Santa Fe Cave Crayfish	*Procambarus erythrops*	SRST
Alachua Light-fleeing Cave Cray	*Procambarus lucifugus*	SRST
Peninsula Crayfish	*Procambarus paeninsulanus*	SRST
Pallid Cave Crayfish	*Procambarus pallidus*	SRST
White Tubercled Crayfish	*Procambarus spiculifer*	SRST
N. Florida Spider Cave Crayfish	*Troglocambarus maclanei*	SRST

Snails

Asian Clam	*Corbicula fluminea* *	SRST
Black-crest Elimia	*Elimia albanyensis*	SRST
Knobby Elimia	*Elimia athearni*	SRST
Rasp Elimia	*Elimia floridensis*	SRST
Variable Spike	*Elliptio icterina*	SRST
Hyacinth Siltsnail	*Floridobia floridana*	SRST
Ichetucknee Siltsnail	*Floridobia mica*	SRST
Cymbal Ancylid	*Laevapex diaphanus*	SRST
Alligator Siltsnail	*Notogillia wetherbyi*	SRST
Snail	*Physella heterostropha pomila*	SRST
Seminole Rams-horn	*Planorbella duryi*	SRST
Mesa Rams-horn	*Planorbella scalaris*	SRST
Apple Snail	*Pomacea paludosa*	SRST
Quilted Melania	*Tarebia granifera* *	SRST
Iridescent Lilliput	*Taxolasma paulus*	SRST
Florida Pondhorn	*Uniomerus carolinianus*	SRST
Little Spectaclecase	*Villosa lienosa*	SRST
Southern Rainbow	*Villosa vibex*	SRST
Downy Rainbow	*Villosa villosa*	SRST

Butterflies and Skippers

Sachem	*Adalopedes campestris*	MTC
Gulf Fritillary	*Agraulis vanillae*	MTC
Lace-winged Roadside Skipper	*Amblyscirtes aesculapius*	MTC
Goatweed Leafwing	*Anaea andria*	SH, UMW
Least Skipper	*Anacyloxypha numitor*	MTC
White Peacock	*Anartia jatrophae*	MTC
Delaware Skipper	*Anatrytone logan*	SH, UMW
Great Southern White	*Ascia monuste*	MTC
Hackberry Emperor	*Asterocampa celtis*	MTC

Ichetucknee Springs State Park Animals

Common Name	*Scientific Name*	Primary Habitat Codes (for all species)
Great Purple Hairstreak	*Atlides halesus*	MTC
Pipevine Swallowtail	*Battus philenor*	SH, UMW
Sweadner's Juniper Hairstreak	*Callophrys gryneus sweadneri*	UHF
Brazilian Skipper	*Calpodes ethlius*	MTC
Red-banded Hairstreak	*Calycopis cecrops*	MTC
Spring Azure	*Celastrina ladon*	AF, FS, UHF
Gemmed Satyr	*Cyllopsis gemma*	MTC
Queen	*Danaus gilippus*	MTC
Monarch	*Danaus plexippus*	MTC
Southern Pearly Eye	*Enodia portlandia*	UHF
Silver-spotted Skipper	*Epargyreus clarus*	MTC
Wild Indigo Duskywing	*Erynnis baptisiae*	SH, UMW
Horace's Duskywing	*Erynnis horatius*	MTC
Juvenal's Duskywing	*Erynnis juvenalis*	MTC
Zarucco Duskywing	*Erynnis zarucco*	MTC
Barred Yellow	*Eurema daira*	MTC
Little Yellow	*Eurema lisa*	MTC
Sleepy Orange	*Eurema nicippe*	MTC
Zebra Swallowtail	*Eurytides marcellus*	SH
Harvester	*Feniseca tarquinius*	UHF
Zebra Heliconian	*Heliconius charitonius*	MTC
Ceraunus Blue	*Hemiargus ceraunus*	MTC
Carolina Satyr	*Hermeuptychia sosybius*	UHF, MH
Dotted Skipper	*Hesperia attalus*	SH, UMW
Meske's Skipper	*Hesperia meskei*	SH
Fiery Skipper	*Hylephila phyleus*	SH
Buckeye	*Junonia coenia*	MTC
Clouded Skipper	*Lerema accuis*	MTC
American Snout	*Libytheana carinenta*	MTC
Viceroy	*Limenitis archippus*	MTC
Red-spotted Purple	*Limenitis arthemis astyanax*	MTC
Cofaqui Giant Skipper	*Megathymus cofaqui*	SH
Yucca Giant Skipper	*Megathymus yuccae*	SH
Viola's Wood Satyr	*Megisto cymela viola*	UHF
Swarthy Skipper	*Nastra lherminier*	SH, UMW
Twin-spotted Skipper	*Oligoria maculata*	SH, UMW
Ocola Skipper	*Panoquina ocola*	MTC
Giant Swallowtail	*Papilio cresphontes*	MTC
Tiger Swallowtail	*Papilio glaucus*	MTC
Palamedes Swallowtail	*Papilio palamedes*	MTC
Black Swallowtail	*Papilio polyxenes*	MTC
Spicebush Swallowtail	*Papilio troilus*	MTC
White-M Hairstreak	*Parrhasius m-album*	MTC
Cloudless Sulfur	*Phoebis sennae*	MTC
Phaon Crescent	*Phyciodes phaon*	MTC
Pearl Crescent	*Phyciodes tharos*	MTC

*** Non-native Species** **+ Extirpated**

Common Name	*Scientific Name*	Primary Habitat Codes (for all species)
Baracoa Skipper	*Polites baracoa*	SH, UMW
Crossline Skipper	*Polites origenes*	SH, UMW
Whirlabout	*Polites vibex*	MTC
Question Mark	*Polygonia interrogationis*	MTC
Checkered White	*Pontia protodice*	MTC
Tropical Checkered Skipper	*Pyrgus oileus*	MTC
Southern Oak Hairstreak	*Satyrium favonius favonius*	MTC
Gray Hairstreak	*Strymon melinus*	MTC
Southern Cloudywing	*Thorybes bathyllus*	MTC
Confused Cloudywing	*Thorybes confusis*	MTC
Northern Cloudywing	*Thorybes pylades*	MTC
Dorantes Longtail Skipper	*Urbanus dorantes*	MTC
Long-tailed Skipper	*Urbanus proteus*	MTC
Red Admiral	*Vanessa atalanta*	MTC
American Lady	*Vanessa virginiensis*	MTC
Southern Dog Face	*Zerene cesonia*	MTC

Macromoths

Greater Red Dart	*Abagrotis alternata*
Yellow-haired Dagger Moth	*Acronicta impleta*
Long-winged Dagger Moth	*Acronicta longa*
Triton Dagger Moth	*Acronicta tritona*
Luna Moth	*Actias luna*
Ipsilon Dart	*Agrotis ipsilon*
Subterranean Dart	*Agrotis subterranea*
Venerable Dart	*Agrotis venerabilis*
Cotton Moth	*Alabama argillacea*
Wittfeld's Forester	*Alypia wittfeldii*
Hook-tipped Amyna	*Amyna bullula*
Brown-shaded Gray	*Anacamptodes defectaria*
Small Purplish Gray	*Anacamptodes humaria*
Gray Geometer	*Anacamptodes pergracilis*
Large Purplish Gray	*Anacamptodes vellivolata*
Common Gray	*Anavitrinella pampinaria*
Green Cutworm Moth	*Anicla infecta*
Clear Oakworm Moth	*Anisota virginiensis*
Spiny Oakworm Moth	*Anisota stigma*
Polyphemus Moth	*Antheraea polyphemus*
Velvetbean Caterpillar Moth	*Anticarsia gemmatalis*
Harnessed Moth	*Apantesis phalerata*
Banded Tiger Moth	*Apantesis vittata*
Spotted Apatelodes	*Apatelodes torrefacta*
Short-lined Chocolate	*Argyrostrotis anilis*
Common Arugisa	*Arugisa latiorella*
Bilobed Looper Moth	*Autographa biloba*
Florida Io Moth	*Automeris io lilith*

Common Name	*Scientific Name*	Primary Habitat Codes (for all species)
White-tailed Diver	*Bellura gortynoides*	
Oak Besma	*Besma quercivoraria*	
Bent-winged Owlet	*Bleptina caradrinalis*	
Owlet Moth	*Bleptina inferior*	
Baltimore Bomolocha	*Bomolocha baltimoralis*	
Dimorphic Bomolocha	*Bomolocha bijugalis*	
Flowing-line Bomolocha	*Bomolocha manalis*	
Mottled Bomolocha	*Bomolocha palparia*	
Vetch Looper Moth	*Caenurgia chloropha*	
Brown Scoopwing	*Calledapteryx dryopterata*	
Florida Fern Caterpillar Moth	*Callopistria floridensis*	
Granitose Fern Moth	*Callopistria granitosa*	
Girlfriend Underwing	*Catocala amica*	
The Betrothed	*Catocala innubens*	
Sappho Underwing	*Catocala sappho*	
Similar Underwing	*Catocala similis*	
Ultronia Underwing	*Catocala ultronia*	
Black Bit Moth	*Celiptera frustulum*	
Waved Sphinx	*Ceratomia undulosa*	
Ceratonyx Inchworm	*Ceratonyx satanaria*	
Tufted Bird-dropping Moth	*Cerma cerintha*	
Trembling Sallow	*Chaetaglaea tremula*	
The Laugher	*Charadra deridens*	
Blackberry Looper Moth	*Chlorochlamys chloroleucaria*	
Angle-winged Emerald	*Chloropteryx tepperaria*	
Black-dotted Brown	*Cissusa spadix*	
Packard's Lichen Moth	*Cisthene packardii*	
Lead-colored Lichen Moth	*Cisthene plumbea*	
Subject Lichen Moth	*Cisthene subjecta*	
Regal Moth	*Citheronia regalis*	
Little White Lichen Moth	*Clemensia albata*	
Grote's Sallow	*Copivaleria grotei*	
Dark Gray Lichen Moth	*Crambidia lithosioides*	
Pure Lichen Moth	*Crambidia pura*	
Cyclophora	*Cyclophora myrtaria*	
Hog Sphinx	*Darapsa myron*	
Black-winged Dahana	*Dahana atripennis*	
Angus's Datana	*Datana angusii*	
Contracted Datana	*Datana contracta*	
Walnut Caterpillar Moth	*Datana integerrima*	
Major Datana	*Datana major*	
Yellow-necked Caterpillar Moth	*Datana ministra*	
Spotted Datana	*Datana perspicua*	
Lettered Sphinx	*Deidamia inscripta*	
Owlet Moth	*Dercetis vitrea*	
Pink Star Moth	*Derrima stellata*	

Common Name	*Scientific Name*	Primary Habitat Codes (for all species)
Showy Emerald	*Dichorda iridaria latipennis*	
Somber Carpet	*Disclisioprocta stellata*	
Pawpaw Sphinx	*Dolba hyloeus*	
Graphic Moth	*Drasteria graphica*	
Rosy Maple Moth	*Dryocampa rubicunda*	
The Bad-wing	*Dyspteris abortivaria*	
Imperial Moth	*Eacles imperialis*	
The Small Engrailed	*Ectropis crepuscularia*	
Alternate Woodling	*Egira alternans*	
Festive Midget	*Elaphria festivoides*	
Variegated Midget	*Elaphria versicolor*	
Pale-veined Enconista	*Enconista dislocaria*	
Mournful Sphinx	*Enyo lugubris*	
Tulip-tree Beauty	*Epimecis hortaria*	
Salt Marsh Moth	*Estigmene acrea*	
The Little Beggar	*Eubaphe meridiana*	
Milkweed Tussock Moth	*Euchaetes egle*	
Deep Yellow Euchlaena	*Euchlaena amoenaria astylusaria*	
Obtuse Euchlaena	*Euchlaena obtusaria*	
Forked Euchlaena	*Euchlaena deductaria*	
Florida Eudeilinea	*Eudeilinea luteifera*	
Beautiful Wood-nymph	*Eudryas grata*	
Pearly Wood-nymph	*Eudryas unio*	
Red-tailed Specter	*Euerythra phasma*	
Lesser Grapevine Looper Moth	*Eulithis diversilineata*	
Greater Grapevine Looper Moth	*Eulithis gracilineata*	
Brown-bordered Geometer	*Eumacaria latiferrugata*	
Common Eupithecia	*Eupithecia miserulata*	
Confused Eusarca	*Eusarca confusaria*	
Underwing Moth	*Euthermisia absumens*	
Roland's Sallow	*Eutolype rolandi*	
Curve-toothed Geometer	*Eutrapela clemataria*	
Hypenid Moth	*Gabara subnivosella bipuncta*	
The Wedgling	*Galgula partida*	
Blueberry Gray	*Glena cognataria*	
Dotted Gray	*Glena cribrataria*	
Texas Gray	*Glenoides texanaria*	
Phyllira Tiger Moth	*Grammia phyllira*	
Placentia Tiger Moth	*Grammia placentia*	
Banded Tussock Moth	*Halysidota tessellaris*	
Clymene Moth	*Haploa clymene*	
Tobacco Budworm Moth	*Heliothis virescens*	
Hypenid Moth	*Hemeroplanis habitalis*	
Variable Tropic	*Hemeroplanis scopulepes*	
Eastern Buck Moth	*Hemileuca maia*	
Heterocampa	*Heterocampa astarte*	

Common Name	*Scientific Name*	Primary Habitat Codes (for all species)
Wavy-lined Heterocampa	*Heterocampa biundata*	
Saddled Prominent	*Heterocampa guttivitta*	
Oblique Heterocampa	*Heterocampa obliqua*	
Small Heterocampa	*Heterocampa subrotata*	
White-blotched Heterocampa	*Heterocampa umbrata*	
Orange Holomelina	*Holomelina aurantiaca*	
Joyful Holomelina	*Holomelina laeta*	
Ruddy Holomelina	*Holomelina rubicundaria*	
Sharp Green Hydriomena	*Hydriomena pluviata meridianata*	
Transfigured Hydriomena	*Hydriomena transfigurata*	
White-lined Sphinx	*Hyles lineata*	
Esther Moth	*Hypagyrtis esther*	
One-spotted Variant	*Hypagyrtis unipunctata*	
Prominent	*Hyparpax perophoroides*	
Long-horned Owlet	*Hypenula cacuminalis*	
Giant Leopard Moth	*Hypercompe scribonia*	
Bird-dropping Moth	*Hyperstrotia nana*	
Fall Webworm Moth	*Hyphantria cunea*	
Umber Moth	*Hypomecis umbrosaria*	
Painted Lichen Moth	*Hypoprepia fucosa*	
Small Necklace Moth	*Hypsoropha hormos*	
Large Necklace Moth	*Hypsoropha monilis*	
Red-bordered Wave	*Idaea demissaria*	
Rippled Wave	*Idaea obfusaria*	
Dot-lined Wave	*Idaea tacturata*	
Gopher Tortoise Noctuid Moth	*Idia gopheri*	
Comon Idia	*Idia aemula*	
American Idia	*Idia americalis*	
Thin-lined Owlet	*Isogona tenuis*	
Laudable Arches	*Lacinipolia laudabilis*	
Walnut Sphinx	*Laothoe juglandis*	
Pine Sphinx	*Lapara coniferarum*	
Owlet Moth	*Lascoria alucitalis*	
Ambiguous Moth	*Lascoria ambigualis*	
Lost Owlet	*Ledaea perditalis*	
Wave	*Leptostales crossii*	
Wave	*Leptostales laevitaria*	
Wave	*Leptostales pannaria*	
Detracted Owlet	*Lesmone detrahens*	
Owlet Moth	*Lesmone hinna*	
Scirpus Wainscot	*Leucania scirpicola*	
Drab Brown Wave	*Lobocleta ossularia*	
Wave	*Lobocleta peralbata*	
Double-lined Prominent	*Lochmaeus bilineata*	
Variable Oakleaf Caterpillar Moth	*Lochmaeus manteo*	
Wave	*Lophosis labeculata*	

Common Name	*Scientific Name*	Primary Habitat Codes (for all species)
Woolly Gray	*Lycia ypsilon*	
Mottled Prominent	*Macrurocampa marthesia*	
Eastern Tent Caterpillar Moth	*Malacosoma americanum*	
Forest Tent Caterpillar Moth	*Malacosoma disstria*	
Rustic Sphinx	*Manduca rustica*	
Carolina Sphinx	*Manduca sexta*	
Light Marathyssa	*Marathyssa basalis*	
Confused Meganola	*Meganola minuscula*	
Canadian Melanolophia	*Melanolophia canadaria choctawae*	
Merry Melipotis	*Melipotis jucunda*	
Common Fungus Moth	*Metalectra discalis*	
Black Fungus Moth	*Metalectra tantillus*	
Purplish Metarranthis	*Metarranthis homuraria*	
Yellow-washed Metarranthis	*Metarranthis obfirmaria*	
Yellow Mocis	*Mocis disseverans*	
Small Mocis	*Mocis latipes*	
Withered Mocis	*Mocis marcida*	
Texas Mocis	*Mocis texana*	
Confused Woodgrain	*Morrisonia confusa*	
Gray Woodgrain	*Morrisonia mucens*	
Oak Beauty	*Nacophora quernaria*	
White-dotted Prominent	*Nadata gibbosa*	
Horned Spanworm Moth	*Nematocampa baggettaria*	
Horned Spanworm Moth	*Nematocampa resistaria*	
Emerald	*Nemoria bifilata*	
Emerald	*Nemoria bistriaria*	
Red-bordered Emerald	*Nemoria lixaria*	
Southern Nepytia	*Nepytia semiclusaria*	
Thin-winged Owlet	*Nigetia formosalis*	
Sorghum Webworm Moth	*Nola cereella*	
Indistinct Angel	*Olceclostera indistincta*	
Hypenid Moth	*Ophiuche degasalis*	
Rose Hooktip	*Oreta rosea*	
White-marked Tussock Moth	*Orgyia leucostigma*	
Bent-line Carpet	*Orthonama centrostrigaria*	
Southern Bent-lined Tan	*Oxycilla mitographa*	
Large Paectes	*Paectes abrostoloides*	
Mouse-colored Lichen Moth	*Pagara simplex*	
Dark-spotted Palthis	*Palthis angulalis*	
Faint-spotted Palthis	*Palthis asopialis*	
Decorated Owlet	*Pangrapta decoralis*	
Orange Panopoda	*Panopoda repanda*	
Red-lined Panopoda	*Panopoda rufimargo*	
Blinded Sphinx	*Paonias excaecatus*	
Small-eyed Sphinx	*Paonias myops*	
Plebeian Sphinx	*Paratraea plebeja*	

*** Non-native Species** **+ Extirpated**

Common Name	*Scientific Name*	Primary Habitat Codes (for all species)
Juniper Geometer	*Patalene olyzonaria puber*	
Angulose Prominent	*Peridea angulosa*	
Barnes Pero	*Pero ancetaria*	
Honest Pero	*Pero honestaria*	
Toothed Phigalia	*Phigalia denticulata*	
Small Phigalia	*Phigalia strigataria*	
The Half-wing	*Phigalia titea*	
Common Oak Moth	*Phoberia atomaris*	
Spotted Phosphila	*Phosphila miselioides*	
Turbulent Phosphila	*Phosphila turbulenta*	
Southern Lappet Moth	*Phyllodesma occidentis*	
Curve-lined Owlet	*Phyprosopus callitrichoides*	
Fervid Plagodis	*Plagodis fervidaria*	
Green Cloverworm Moth	*Plathypena scabra*	
Mobile Groundling	*Platysenta mobilis*	
The Cobbler	*Platysenta sutor*	
White-dotted Groundling	*Platysenta videns*	
Common Tan Wave	*Pleuroprucha insulsaria*	
The Hebrew	*Polygrammate hebraeicum*	
Alien Probole	*Probole alienaria*	
Large Maple Spanworm Moth	*Prochoerodes transversata*	
Porcelain Gray	*Protoboarmia porcelaria*	
Figure-eight Sallow	*Psaphida resumens*	
Soybean Looper Moth	*Pseudoplusia includens*	
Common Ptichodis	*Ptichodis herbarum*	
Black-tipped Ptichodis	*Ptichodis vinculum*	
Tiger Moth	*Pygarctia abdominalis*	
Gray Looper Moth	*Rachiplusia ou*	
Renia	*Renia adspergillus*	
Discolored Renia	*Renia discoloralis*	
Renia	*Renia flavipunctalis*	
Fraternal Renia	*Renia fraternalis*	
Chocolate Renia	*Renia nemoralis*	
Sober Renia	*Renia sobrialis*	
Bina Flower Moth	*Schinia bina*	
Ragweed Flower Moth	*Schinia rivulosa*	
Brown Flower Moth	*Schinia saturata*	
Flower Moth	*Schinia sordida*	
Three-lined Flower Moth	*Schinia trifascia*	
Flower Moth	*Schinia tuberculum*	
Red-humped Caterpillar Moth	*Schizura concinna*	
Morning-glory Prominent	*Schizura ipomoeae*	
Unicorn Caterpillar Moth	*Schizura unicornis*	
Black-spotted Schrankia	*Schrankia macula*	
Dead-wood Borer Moth	*Scolecocampa liburna*	
Small Frosted Wave	*Scopula lautaria*	

Common Name	*Scientific Name*	Primary Habitat Codes (for all species)
Large Lace-border	*Scopula limboundata* f. *"enucleata"* f. *"relevata"*	
Echo Moth	*Seirarctia echo*	
Selenis Moth	*Selenis monotropa*	
Legume Caterpillar Moth	*Selenisa sueroides*	
Common Angle	*Semiothisa aemulataria*	
Bicolored Angle	*Semiothisa bicolorata*	
Curve-lined Angle	*Semiothisa continuata*	
Southern Chocolate Angle	*Semiothisa distribuaria*	
Hollow-spotted Angle	*Semiothisa gnophosaria*	
Promiscuous Angle	*Semiothisa promiscuata*	
Agreeable Tiger Moth	*Spilosoma congrua*	
Virginian Tiger Moth	*Spilosoma virginica*	
Dolichos Armyworm Moth	*Spodoptera dolichos*	
Southern Armyworm Moth	*Spodoptera eridania*	
Yellow-striped Armyworm Moth	*Spodoptera ornithogalli*	
Common Spragueia	*Spragueia leo*	
Black-dotted Spragueia	*Spragueia onagrus*	
Approximate Stenotrachelys	*Stenotrachelys approximaria*	
White-headed Prominent	*Symmerista albifrons*	
Southern Emerald	*Synchlora frondaria denticularia*	
Emerald	*Synchlora xysteraria*	
Olive-shaded Bird-dropping Moth	*Tarachidia candefacta*	
The Half-yellow	*Tarachidia semiflava*	
Florida Tetanolita	*Tetanolita floridana*	
Smoky Tetanolita	*Tetanolita mynesalis*	
Black-bordered Lemon Moth	*Thioptera nigrofimbria*	
Black-dotted Ruddy	*Thysanopyga intractata*	
Small Tolype	*Tolype notialis*	
Large Tolype	*Tolype velleda*	
Gray	*Tornos cinctarius*	
Dimorphic Gray	*Tornos scolopacinarius*	
Cabbage Looper Moth	*Trichoplusia ni*	
Striped Garden Caterpillar Moth	*Trichordestra legitima*	
Knee-joint Dart	*Trichosilia geniculata*	
Sheathed Quaker	*Ulolonche culea*	
Bella Moth	*Utetheisa bella*	
Spanish Moth	*Xanthopastis timais*	
Tersa Sphinx	*Xylophanes tersa*	
Red-winged Sallow	*Xystopeplus rufago*	
Green-dusted Zale	*Zale aeruginosa*	
Double-banded Zale	*Zale calycanthata*	
Zale	*Zale declarans*	
Maple Zale	*Zale galbanata*	
Horrid Zale	*Zale horrida*	
Lunate Zale	*Zale lunata*	
Bold-based Zale	*Zale lunifera*	

Common Name	*Scientific Name*	Primary Habitat Codes (for all species)

Zale ..... *Zale metata*
Gray-banded Zale ..... *Zale squamularis*
Black Zale ..... *Zale undularis*
Early Zanclognatha ..... *Zanclognatha cruralis*
Dark Zanclognatha ..... *Zanclognatha obscuripennis*
Grayish Zanclognatha ..... *Zanclognatha pedipilalis*

Micromoths
Garden Webworm Moth ..... *Achyra rantalis*
Acrolophus Moth ..... *Acrolophus plumifrontella*
Acrolophus Moth ..... *Acrolophus propinquus*
Phycitid Moth ..... *Adelphia petrella*
Slug Caterpillar Moth ..... *Adoneta spinuloides*
Pyraustid Moth ..... *Agathodes designalis*
Grease Moth ..... *Aglossa cuprina*
Pyraustid Moth ..... *Anania florella*
Oecophorid Moth ..... *Antaeotricha leucillana*
Slug Caterpillar Moth ..... *Apoda y-inversum*
Fruit-tree Leafroller Moth ..... *Archips argyrospila*
Crambus Moth ..... *Argyria nummulalis*
Leafroller Moth ..... *Argyrotaenia quercifoliana*
Red-banded Leafroller Moth ..... *Argyrotaenia velutinana*
Ailanthus Webworm Moth ..... *Atteva pustulella*
Pyraustid Moth ..... *Blepharomastix ebulealis*
Pyraustid Moth ..... *Blepharomastix ranalis*
Almond Moth ..... *Cadra cautella*
Cochylid Moth ..... *Carolella erigeronana*
Cochylid Moth ..... *Carolella sartana*
Spotted Fireworm Moth ..... *Choristoneura parallela*
Oblique-banded Leafroller Moth .. *Choristoneura rosaceana*
Chrysaugid Moth ..... *Clydonopteron sacculana*
Pyraustid Moth ..... *Conchylodes ovulalis*
Pecan Carpenterworm Moth ..... *Cossula magnifica*
Crambus Moth ..... *Crambus decorellus*
Crambus Moth ..... *Crambus praefectellus*
Crambus Moth ..... *Crambus quinquareatus*
Crambus Moth ..... *Crambus satrapellus*
Pyraustid Moth ..... *Crocidophora tuberculalis*
Bagworm Moth ..... *Cryptothelea gloverii*
Grape Leaffolder Moth ..... *Desmia funeralis*
Grape Leaffolder Moth ..... *Desmia subdivisalis*
Pyraustid Moth ..... *Diaphania modialis*
Crambus Moth ..... *Diatraea saccharalis*
Gelechiid Moth ..... *Dichomeris flavocostella*
Palmerworm Moth ..... *Dichomeris legnatoa*
Glaphyriid Moth ..... *Dicymolomia julianalis*

Common Name	*Scientific Name*	Primary Habitat Codes (for all species)
Pitch Moth	*Dioryctria amatella*	
Pitch Moth	*Dioryctria pygmaeella*	
Plume Moth	*Emmelina monodactyla*	
Bidens Borer Moth	*Epiblema otiosana*	
Pyraustid Moth	*Epipagis huronalis*	
Epipaschiid Moth	*Epipaschia zelleri*	
Phycitid Moth	*Etiella zinckenella*	
Spiny Oak-slug Moth	*Euclea delphinii*	
Cosmopterigid Moth	*Euclemensia bassettella*	
Borer Moth	*Eucosma robinsonana*	
Phycitid Moth	*Euzophera magnolialis*	
Phycitid Moth	*Euzophera ostricolorella*	
Redbud Leaffolder Moth	*Fascista cercerisella*	
Glaphyriid Moth	*Glaphyria cappsi*	
Glaphyriid Moth	*Glaphyria sesquistrialis*	
Blastobasid Moth	*Glyphidocera lactiflosella*	
Grapeleaf Skeletonizer Moth	*Harrisina americana*	
Pyraustid Moth	*Helvibotys helvialis*	
Pyralis Moth	*Herculia binodulalis*	
Pyralis Moth	*Herculia olinalis*	
Pyraustid Moth	*Herpetogramma phaeopteralis*	
Spotted Beet Webworm Moth	*Hymenia perspectalis*	
Oecophorid Moth	*Inga sparsiciliella*	
Slug Caterpillar Moth	*Isa textula*	
Slug Caterpillar Moth	*Isochaetes beutenmuelleri*	
Lacturid Moth	*Lactura basistriga*	
Yellow Flannel Moth	*Lagoa pyxidifera*	
Plume Moth	*Leioptilus paleaceus*	
Chrysaugid Moth	*Lepidomys irrenosa*	
Slug Caterpillar Moth	*Limacodes rectilinea*	
Slug Caterpillar Moth	*Lithacodes fasciola*	
Pyraustid Moth	*Marasmia cochrusalis*	
Southern Flannel Moth	*Megalopyge opercularis*	
Filbertworm Moth	*Melissopus latiferreanus*	
Slug Caterpillar Moth	*Monoleuca erectifascia*	
Slug Caterpillar Moth	*Monoleuca semifascia*	
Nymphulid Moth	*Munroessa gyralis*	
Nymphulid Moth	*Munroessa icciusalis*	
Nason's Slug Moth	*Natada nasoni*	
Nymphulid Moth	*Neargyractis slossonalis*	
Pyraustid Moth	*Nomophila nearctica*	
White Flannel Moth	*Norape ovina*	
Galleriid Moth	*Omphalocera munroei*	
Pyraustid Moth	*Palpita magniferalis*	
Basswood Leafroller Moth	*Pantographa limata*	
Chrysaugid Moth	*Parachma ochracealis*	

Common Name	*Scientific Name*	Primary Habitat Codes (for all species)
China-mark Moth	*Parapoynx diminutalis*	
Nymphulid Moth	*Paraponyx obscuralis*	
Schoenus Moth	*Patissa vestaliella*	
Pyraustid Moth	*Perispasta caeculalis*	
Petrophila	*Petrophila santafealis*	
Pyraustid Moth	*Phlyctaenia coronata tertialis*	
Leafroller Moth	*Platynota flavedana*	
Leafroller Moth	*Platynota nigrocervina*	
Indian-meal Moth	*Plodia interpunctella*	
Diamondback Moth	*Plutella xylostella*	
Webworm Moth	*Pococera militella*	
Skiff Moth	*Prolimacodes badia argentimacula*	
Oecophorid Moth	*Psilocorsis quercicella*	
Pyraustid Moth	*Pterygisus stenialis*	
Garden Tortrix	*Ptycholoma peritana*	
Pyralis Moth	*Pyralis disciferalis*	
Pyraustid Moth	*Pyrausta acrionalis*	
Pyraustid Moth	*Pyrausta tyralis*	
Borer Moth	*Rhyacionia rigidana*	
Spilomelid Moth	*Samea baccatalis*	
Pyraustid Moth	*Samea ecclesialis*	
Pyraustid Moth	*Sameodes adipaloides*	
Pyraustid Moth	*Sameodes elealis*	
Pyraustid Moth	*Sameodes mopsalis*	
Pyraustid Moth	*Sameodes phyllisalis*	
Scheonus Moth	*Schoenobius sordidellus*	
Saddleback Caterpillar Moth	*Sibine stimulea*	
Fruitworm Moth	*Sparganothis reticulatana*	
Sparganothis Fruitworm Moth	*Sparganothis sulfureana*	
Plume Moth	*Stenoptilodes taprobanes*	
Lesser Peachtree Borer Moth	*Synanthedon pictipes*	
Pyraustid Moth	*Terastia meticulosalis*	
Pine Webworm Moth	*Tetralopha robustella*	
Lespedeza Webworm Moth	*Tetralopha scortealis*	
Webworm Moth	*Tetralopha subcanalis*	
Chrysaugid Moth	*Tosale oviplagalis*	
Crambus Moth	*Urola nivalis*	
Crambus Moth	*Xubida linearella*	
American Ermine Moth	*Yponomeuta multipunctella*	

Dragonflies and Damselflies

Common Green Darner	*Anax junius*	MTC
Two-striped Forceptail	*Aphylla williamsoni*	SH, UMW, UP
Variable Dancer	*Argia fumipennis*	SRST
Powdered Dancer	*Argia moesta*	SRST
Blue-ringed Dancer	*Argia sedula*	SRST

Common Name	*Scientific Name*	Primary Habitat Codes (for all species)
Four-spotted Pennant	*Brachymesia gravida*	IAP
Halloween Pennant	*Celithemis eponina*	MTC
Prince Baskettail	*Epitheca princeps*	SRST
Eastern Pondhawk	*Erythemis simplicicollis*	MTC
Sandhill Clubtail	*Gomphus cavillaris*	SH, UMW, UP
Blackwater Clubtail	*Gomphus dilatatus*	SRST
Cypress Clubtail	*Gomphus minutus*	SH, UMW, UP
Twilight Darner	*Gynacantha nervosa*	SRST
Dragonhunter	*Hagenius brevistylus*	SRST
Smokey Rubyspot	*Hetaerina titia*	SRST
Citrine Forktail	*Ischnura hastata*	SRST
Fragile Forktail	*Ischnura posita*	SRST
Slaty Skimmer	*Libellula incesta*	SRST
Great Blue Skimmer	*Libellula vibrans*	MTC
Royal River Cruiser	*Macromia taeniolata*	SRST
Roseate Skimmer	*Orthemis ferruginea*	SH, SKLK
Blue Dasher	*Pachydiplax longipennis*	MTC
Wandering Glider	*Pantala flavescens*	MTC
Eastern Amberwing	*Perithemis tenera*	SRST
Common Whitetail	*Plathemis lydia*	SH, UMW, UP
Carolina Saddlebags	*Tramea carolina*	MTC
Grasshoppers, Crickets, and Katydids		
Long-headed Toothpick	*Achurum carinatum*	MTC
Oblong-winged Katydid	*Amblycorypha oblongifolia*	MTC
Brown Winter Grasshopper	*Amblytropidia mysteca*	MTC
FL. Purple-striped Grasshopper	*Hesperotettix viridis*	MTC
Wrinkled Grasshopper	*Hippiscus ocelote*	MTC
Modest Spurthroat Grasshopper	*Melanoplus impudicus*	MTC
Red-legged Grasshopper	*Melanoplus propinquus*	MTC
FL. Least Spurthroat Grasshopper	*Melanoplus puer*	MTC
Swollen Spurthroat Grasshopper	*Melanoplus strumosus*	MTC
Spotted-winged Grasshopper	*Orphulella pelidna*	MTC
Orange-winged Grasshopper	*Pardalophora phoenicoptera*	MTC
Rusty Grasshopper	*Schistocera alutecea*	MTC
American Grasshopper	*Schistocera americana*	MTC
Mischevious Grasshopper	*Schistocera damnifica*	MTC
Ridgeback Grasshopper	*Spharagemon cristatum*	MTC
Marbled Grasshopper	*Spharagemon marmorata*	MTC
Handsome Grasshopper	*Syrabula admirabilis*	MTC
Beetles		
Tiger Beetle	*Cincindela scutellaris*	MTC
True Bugs		
Florida Predatory Stink Bug	*Euthyrynchus floridanus*	MTC

*** Non-native Species** **+ Extirpated**

Common Name	*Scientific Name*	Primary Habitat Codes (for all species)
Flies		
Bee Fly	*Anthrax georgicus*	MTC
Spiders		
Trapdoor Spider	*Ummidia* sp	MTC
VERTEBRATES		
Fish		
Gulf Sturgeon	*Acipenser oxyrinchus desotoi*	SRST
Mountain Mullet	*Agonostomus monticola*	SRST
Yellow Catfish	*Ameiurus natalis*	SRST
Bowfin	*Amia calva*	SRST
American Eel	*Anguilla rostrata*	SRST
Pirate Perch	*Aphredoderus sayanus*	SRST
Crevalle Jack	*Caranx hippos*	SRST
Warmouth	*Chaenobryttus gulosus*	SRST
Everglades Pygmy Sunfish	*Elassoma evergladei*	SRST
Okefenokee Pygmy Sunfish	*Elassoma okefenokee*	SRST
Banded Pygmy Sunfish	*Elassoma zonatum*	SRST
Lake Chubsucker	*Erimyzon sucetta*	SRST
Redfin Pickerel	*Esox americanus*	SRST
Brown Darter	*Etheostoma edwini edwini*	SRST
Eastern Starhead Topminnow	*Fundulus escambiae*	SRST
Seminole Killifish	*Fundulus seminolis*	SRST
Mosquitofish	*Gambusia holbrooki*	SRST
Least Killifish	*Heterandria formosa*	SRST
Flagfish	*Jordanella floridae*	SRST
Longnose Gar	*Lepisosteus osseus*	SRST
Florida Gar	*Lepisosteus platyrhincus*	SRST
Redbreast Sunfish	*Lepomis auritus*	SRST
Bluegill	*Lepomis macrochirus*	SRST
Dollar Sunfish	*Lepomis marginatus*	SRST
Shellcracker	*Lepomis microlophus*	SRST
Stumpknocker	*Lepomis punctatus*	SRST
Bluefin Killifish	*Lucania goodei*	SRST
Suwannee Bass	*Micropterus notius*	SRST
Florida Largemouth Bass	*Micropterus salmoides floridanus*	SRST
Spotted Sucker	*Minytrema melanops*	SRST
Striped Mullet	*Mugil cephalus*	SRST
Golden Shiner	*Notemigonus crysoleucas*	SRST
Redeye Chub	*Notropis harperi*	SRST
Coastal Shiner	*Notropis petersoni*	SRST
Tadpole Madtom	*Noturus gyrinus*	SRST

*** Non-native Species** **+ Extirpated**

Common Name	*Scientific Name*	Primary Habitat Codes (for all species)
Speckled Madtom	*Noturus leptacanthus*	SRST
Blackbanded Darter	*Percina nigrofasciata*	SRST
Sailfin Molly	*Poecilia latipinna*	SRST
Speckled Perch	*Pomoxis nigromaculatus*	SRST
Sailfin Shiner	*Pteronotropsis hypselopterus*	SRST
Armored Catfish	*Pterygoplicthys* sp.*	SRST
Atlantic Needlefish	*Strongylura marina*	SRST
Gulf Pipefish	*Syngnathus scovelli*	SRST
Hogchoker	*Trinectes maculatus*	SRST

AMPHIBIANS

Frogs and Toads

Florida Cricket Frog	*Acris gryllus dorsalis*	FS
Two-toed Amphiuma	*Amphiuma means*	SRST
Oak Toad	*Anaxyrus quercicus*	UMW
Southern Toad	*Anaxyrus terrestris*	UHF
Greenhouse Frog	*Eleutherodactylus planirostris planirostris**	UHF
Eastern Narrowmouth Toad	*Gastrophryne carolinensis*	UHF
Gray Treefrog	*Hyla chrysoscelisI*	UHF, AF
Green Treefrog	*Hyla cinerea*	UHF
Pinewoods Treefrog	*Hyla femoralis*	UMW, FS
Squirrel Treefrog	*Hyla squirella*	UHF
Florida Gopher Frog	*Lithobates capito*	SH
Bull Frog	*Lithobates catesbeiana*	FM, FS
Bronze Frog	*Lithobates clamitans clamitans*	SRST
Pig Frog	*Lithobates grylio*	FM, FS
Southern Leopard Frog	*Lithobates sphenocephala*	FM, FS
Cuban Treefrog	*Osteopilus septentrionalis* *	UHF
Spring Peeper	*Pseudacris crucifer*	UHF, AF
Southern Chorus Frog	*Pseudacris nigrita*	FM, FS
Ornate Chorus Frog	*Pseudacris ornata*	FM, FS
Eastern Spadefoot	*Scaphiopus holbrooki holbrooki*	UMW

Salamanders

Central Newt	*Notophthalmus viridescens louisianensis*	SRST
Southeastern Slimy Salamander	*Plethodon grobmani*	UHF
Eastern Lesser Siren	*Siren intermedia intermedia*	FM, FS
Greater Siren	*Siren lacertina*	SRST

REPTILES

Crocodilians

American Alligator	*Alligator mississippiensis*	SRST

*** Non-native Species** **+ Extirpated**

Ichetucknee Springs State Park Animals

Common Name	*Scientific Name*	Primary Habitat Codes (for all species)
Turtles		
Florida Softshell	*Apalone ferox*	SRST
Florida Snapping Turtle	*Chelydra serpentina osceola*	FS
Gopher Tortoise	*Gopherus polyphemus*	SH, UP
Suwan. Alligator Snapping Turtle	*Macrochelys suwanniensis*	SRST
River Cooter	*Pseudemys concinna*	SRST
Florida Cooter	*Pseudemys floridana*	SRST
Florida Red-bellied Turtle	*Pseudemys nelsoni*	SRST
Peninsula Cooter	*Pseudemys peninsularis*	SRST
Suwannee Cooter	*Pseudemys suwanniensis*	SRST
Loggerhead Musk Turtle	*Sternotherus minor minor*	SRST
Stinkpot	*Sternotherus odoratus*	SRST
Florida Box Turtle	*Terrapene carolinensis bauri*	UHF
Red-eared Slider	*Trachemys scripta elegans* *	SRST
Yellow-bellied Sllider	*Trachemys scripta scripta*	SRST
Lizards		
Green Anole	*Anolis carolinensis*	MTC
Brown Anole	*Anolis sagrei**	DV
Six-lined Racerunner	*Aspidoscelis sexlineatus*	SH
Northern Mole Skink	*Plestiodon egregius similis*	SH
Southeastern Five-lined Skink	*Plestiodon inexpectatus*	UHF, UP
Broad-head Skink	*Plestiodon laticeps*	UHF
Mediterranean Gecko	*Hemidactylus turcicus* *	DV
Eastern Slender Glass Lizard	*Ophisaurus attenuatus longicaudus*	SH
Eastern Glass Lizard	*Ophisaurus ventralis*	UP
Florida Worm Lizard	*Rhineura floridana*	SH
Southern Fence Lizard	*Sceloporus undulatus*	SH
Ground Skink	*Scincella lateralis*	UHF
Snakes		
Florida Cottonmouth	*Agkistrodon piscivorus conanti*	FS
Scarlet Snake	*Cemophora coccinea*	UP, UMW
Southern Black Racer	*Coluber constrictor priapus*	UHF, UP, UMW
E. Diamondback Rattlesnake	*Crotalus adamanteus*	SH
Southern Ringneck Snake	*Diadophis punctatus punctatus*	UHF
Eastern Indigo Snake	*Drymarchon couperi*	SH, UP
Eastern Mud Snake	*Farancia abacura abacura*	FM
Rainbow Snake	*Farancia erytrogramma erytrogramma*	FS
Eastern Hognose Snake	*Heterodon platyrhinos*	SH
Short-tailed Snake	*Lampropeltis extentuata*	SH
Eastern Kingsnake	*Lampropeltis getula getula*	UHF
Scarlet Kingsnake	*Lampropeltis elapsoides*	UP
Eastern Coachwhip	*Masticophis flagellum flagellum*	UP
Eastern Coral Snake	*Micrurus fulvius fulvius*	UHF
Redbelly Water Snake	*Nerodia erythrogaster erythrogaster*	SRST

*** Non-native Species** **+ Extirpated**

Common Name	*Scientific Name*	Primary Habitat Codes (for all species)
Florida Water Snake	*Nerodia fasciata pictiventris*	FM
Florida Green Water Snake	*Nerodia floridana*	FM
Brown Water Snake	*Nerodia taxispilota*	FS
Rough Green Snake	*Opheodrys aestivus*	UHF, UP
Eastern Rat Snake	*Pantherophis alleghaniensis*	UHF, UP, UMW
Red Corn Snake	*Pantherophis guttatus*	SH, UP
Florida Pine Snake	*Pituophis melanoleucus mugitus*	SH
North Florida Swamp Snake	*Seminatrix pygaea pygaea*	FS
Florida Redbelly Snake	*Storeria occipitomaculata obscura*	UHF
Florida Crowned Snake	*Tantilla relicta neilli*	SH
Peninsula Ribbon Snake	*Thamnophis sauritus sackenii*	UHF
Eastern Garter Snake	*Thamnophis sirtalis sirtalis*	UHF

BIRDS

Ducks and Geese

Black-bellied Whistling-Duck	*Dendrocygna autumnalis*	FM, SKLK, SRST
Fulvous Whistling-Duck	*Dendrocygna bicolor*	FM, SRST
Canada Goose	*Branta canadensis*	OF
Blue-winged Teal	*Anas discors*	FM, SRST
Mallard	*Anas platyrhynchos*	FM, SRST
Domestic Mallard	*Anas platyrhynchos* *	FM, SKLK, SRST
Northern Pintail	*Anas acuta*	FM, SRST
Redhead	*Aythya americana*	SRST
Ring-necked Duck	*Aythya collaris*	FM, SRST
Lesser Scaup	*Aythya affinis*	FM, SRST
Wood Duck	*Aix sponsa*	FM, SRST
Hooded Merganser	*Lophodytes cucullatus*	FM, SRST
Red-breasted Merganser	*Mergus serrator*	SRST

New World Quail

Northern Bobwhite	*Colinus virginianus*	SH

Pheasants and Grouse

Wild Turkey	*Meleagris gallopavo*	SH ,UMW, AF

Grebes

Pied-billed Grebe	*Podilymbus podiceps*	SRST

Pigeons and Doves

Rock Pigeon	*Columba livia* *	DV, OF
Eurasian Collared-Dove	*Streptopelia decaocto* *	DV
Common Ground Dove	*Columbina passerina*	SH
White-winged Dove	*Zenaida asiatica*	SH, DV
Mourning Dove	*Zenaida macroura*	MTC

*** Non-native Species** **+ Extirpated**

Common Name	*Scientific Name*	Primary Habitat Codes (for all species)
Cuckoos, Roadrunners, and Anis		
Yellow-billed Cuckoo	*Coccyzus americanus*	UHF, AF
Black-billed Cuckoo	*Coccyzus erythropthalmus*	UHF, AF
Nightjars		
Common Nighthawk	*Chordeiles minor*	SH, OF
Chuck-will's-widow	*Antrostomus carolinensis*	SH, UHF, UMW
Eastern Whip-poor-will	*Antrostomus vociferus*	SH, UHF
Swifts		
Chimney Swift	*Chaetura pelagica*	MTC, OF
Hummingbirds		
Ruby-throated Hummingbird	*Archilochus colubris*	UHF, UMW
Rails, Gallinules, and Coots		
Virginia Rail	*Rallus limicola*	FM
Sora	*Porzana carolina*	FM
Purple Gallinule	*Porphyrula martinicus*	FM
Common Gallinule	*Gallinula galeata*	FM
American Coot	*Fulica americana*	FM, SRST
Limpkins		
Limpkin	*Aramus guarauna*	FM, SRST
Cranes		
Sandhill Crane	*Grus canadensis*	FM, OF
Plovers		
Killdeer	*Charadrius vociferus*	RU, DV, OF
Sandpipers		
Spotted Sandpiper	*Actitis macularia*	FS, SRST
Solitary Sandpiper	*Tringa solitaria*	FS, SRST
American Woodcock	*Scolopax minor*	UHF, AF, FS
Gulls and Terns		
Ring-billed Gull	*Larus delawarensis*	MTC, OF
Loons		
Common Loon	*Gavia immer*	SRST, OF
Storks		
Wood Stork	*Mycteria americana*	DS, FS, OF

*** Non-native Species** **+ Extirpated**

Common Name	*Scientific Name*	Primary Habitat Codes (for all species)
Cormorants		
Double-crested Cormorant	*Phalocrocorax auritus*	SRST
Anhingas		
Anhinga	*Anhinga anhinga*	SRST
Pelicans		
American White Pelican	*Pelecanus erythrorhynchos*	OF
Herons, Egrets, and Bitterns		
American Bittern	*Botaurus lentiginosus*	FM
Great Blue Heron	*Ardea herodias*	FM, SKLK, SRST
Great Egret	*Ardea alba*	FM, SRST
Snowy Egret	*Egretta thula*	FM, SRST
Little Blue Heron	*Egretta caerulea*	FM, SKLK, SRST
Tricolored Heron	*Egretta tricolor*	FM, SRST
Cattle Egret	*Bubulcus ibis*	RU, DV, OF
Green Heron	*Butorides virescens*	FM, SKLK, SRST
Black-crowned Night-Heron	*Nycticorax nycticorax*	FM, FS
Yellow-crowned Night-Heron	*Nyctanassa violacea*	FM, FS
Ibises and Spoonbills		
White Ibis	*Eudocimus albus*	FM, FS
Glossy Ibis	*Plegadis falcinellus*	SRST
Roseate Spoonbill	*Platalea ajaja*	FM
New World Vultures		
Black Vulture	*Coragyps atratus*	OF, MTC
Turkey Vulture	*Cathartes aura*	OF, MTC
Ospreys		
Osprey	*Pandion haliaetus*	SRST, OF
Kites, Eagles, and Hawks		
Swallow-tailed Kite	*Elanoides forficatus*	MTC, OF
Northern Harrier	*Circus cyaneus*	OF
Sharp-shinned Hawk	*Accipiter striatus*	UHF, UMW
Cooper's Hawk	*Accipiter cooperii*	UHF, UMW
Everglades Snail Kite	*Rostrhamus sociabilis plumbeus*	FM
Mississippi Kite	*Ictinia mississippiensis*	MTC, OF
Bald Eagle	*Haliaeetus leucocephalus*	SRST, OF
Red-shouldered Hawk	*Buteo lineatus*	UHF, AF, FS, OF
Broad-winged Hawk	*Buteo platypterus*	UHF, AF, FS
Red-tailed Hawk	*Buteo jamaicensis*	SH, UP, OF

Common Name	*Scientific Name*	Primary Habitat Codes (for all species)
Barn Owls		
Barn Owl	*Tyto alba*	MTC
Owls		
Eastern Screech-Owl	*Megascops asio*	SH, UHF
Great Horned Owl	*Bubo virginianus*	SH, UHF, UMW
Barred Owl	*Strix varia*	AF, FS
Kingfishers		
Belted Kingfisher	*Megaceryle alcyon*	SRST
Woodpeckers		
Red-headed Woodpecker	*Melanerpes erythrocephalus*	SH
Red-bellied Woodpecker	*Melanerpes carolinus*	MTC
Yellow-bellied Sapsucker	*Sphyrapicus varius*	UHF, AF
Downy Woodpecker	*Picoides pubescens*	MTC
Hairy Woodpecker	*Picoides villosus*	SH
Northern Flicker	*Colaptes auratus*	SH, UMW
Pileated Woodpecker	*Dryocopus pileatus*	UHF, UMW, AF
Falcons		
American Kestrel	*Falco sparverius*	SH
Southeastern American Kestrel	*Falco sparverius paulus*	SH
Tyrant Flycatchers		
Great Crested Flycatcher	*Myiarchus crinitus*	UMW, UP, AF, FS
Eastern Kingbird	*Tyrannus tyrannus*	SH
Eastern Wood-Pewee	*Contopus virens*	SH, UMW
Yellow-bellied Flycatcher	*Empidonax flaviventris*	FS
Acadian Flycatcher	*Empidonax virescens*	AF, FS
Eastern Phoebe	*Sayornis phoebe*	MTC
Shrikes		
Loggerhead Shrike	*Lanius ludovicianus*	SH
Vireos and Allies		
White-eyed Vireo	*Vireo griseus*	MTC
Yellow-throated Vireo	*Vireo flavifrons*	SH, UP
Blue-headed Vireo	*Vireo solitarius*	UHF, UMW
Red-eyed Vireo	*Vireo olivaceus*	UHF, AF
Crows, Magpies, and Jays		
Blue Jay	*Cyanocitta cristata*	MTC
American Crow	*Corvus brachyrhynchos*	MTC, OF
Fish Crow	*Corvus ossifragus*	MTC, OF

Common Name	*Scientific Name*	Primary Habitat Codes (for all species)
Swallows		
Tree Swallow	*Tachycineta bicolor*	MTC, OF
N. Rough-winged Swallow	*Stelgidopteryx serripennis*	FM, OF
Purple Martin	*Progne subis*	RU, OF
Barn Swallow	*Hirundo rustica*	MTC, OF
Chickadees and Titmice		
Carolina Chickadee	*Poecile carolinensis*	MTC
Tufted Titmouse	*Baeolophus bicolor*	MTC
Nuthatches		
Red-breasted Nuthatch	*Sitta canadensis*	SH, UMW, UHF
Brown-headed Nuthatch	*Sitta pusilla*	MF, SH
Creepers		
Brown Creeper	*Certhia americana*	UHF, AF
Wrens		
House Wren	*Troglodytes aedon*	MTC
Winter Wren	*Troglodytes hiemalis*	FS
Sedge Wren	*Cistothorus platensis*	FM
Marsh Wren	*Cistothorus palustris*	FM
Carolina Wren	*Thryothorus ludovicianus*	MTC
Gnatcatchers		
Blue-gray Gnatcatcher	*Polioptila caerulea*	MTC
Kinglets		
Golden-crowned Kinglet	*Regulus satrapa*	SH, UMW
Ruby-crowned Kinglet	*Regulus calendula*	MTC
Thrushes		
Eastern Bluebird	*Sialia sialis*	MF, SH
Veery	*Catharus fuscescens*	UHF
Gray-cheeked Thrush	*Catharus minimus*	UHF
Swainson's Thrush	*Catharus ustulatus*	UHF
Hermit Thrush	*Catharus guttatus*	UHF, UMW
Wood Thrush	*Hylocichla mustelina*	UHF
American Robin	*Turdus migratorius*	MTC
Mockingbirds and Thrashers		
Gray Catbird	*Dumetella carolinensis*	UHF, RU
Brown Thrasher	*Toxostoma rufum*	UHF, RU
Northern Mockingbird	*Mimus polyglottos*	MTC

*** Non-native Species** **+ Extirpated**

Common Name	*Scientific Name*	Primary Habitat Codes (for all species)
Starlings		
European Starling	*Sturnus vulgaris* *	DV
Waxwings		
Cedar Waxwing	*Bombycilla cedrorum*	MTC
Old World Sparrows		
House Sparrow	*Passer domesticus* *	RU, DV
Finches		
Purple Finch	*Haemorhous purpurea*	UHF, UMW
House Finch	*Haemorhous mexicanus* *	DV
Pine Siskin	*Spinus pinus*	UHF, UMW
American Goldfinch	*Spinus tristis*	MTC
New World Sparrows		
Bachman's Sparrow	*Peucaea aestivalis*	SH
Grasshopper Sparrow	*Ammodramus savannarum*	SH
Chipping Sparrow	*Spizella passerina*	SH, RU
Field Sparrow	*Spizella pusilla*	SH
Fox Sparrow	*Passerella iliaca*	UHF, UMW
Dark-eyed Junco	*Junco hyemalis*	SH
White-throated Sparrow	*Zonotrichia albicollis*	UHF, UMW
Vesper Sparrow	*Pooecetes gramineus*	SH
Savannah Sparrow	*Passerculus sandwichensis*	SH
Song Sparrow	*Melospiza melodia*	SH, UMW
Swamp Sparrow	*Melospiza georgiana*	FM, FS
Eastern Towhee	*Pipilo erythrophthalmus*	MF, SH, UMW
Yellow-breasted Chats		
Yellow-breasted Chat	*Icteria virens*	FS, AF
Blackbirds and Orioles		
Bobolink	*Dolichonyx oryzivorus*	SH, FM
Eastern Meadowlark	*Sturnella magna*	SH
Orchard Oriole	*Icterus spurius*	SH, UP
Baltimore Oriole	*Icterus galbula*	UHF, UMW
Red-winged Blackbird	*Agelaius phoeniceus*	FM
Brown-headed Cowbird	*Molothrus ater*	MTC
Rusty Blackbird	*Euphagus carolinus*	FS, FM
Common Grackle	*Quiscalus quiscula*	MTC
Boat-tailed Grackle	*Quiscalus major*	MTC

*** Non-native Species** **+ Extirpated**

Common Name	*Scientific Name*	Primary Habitat Codes (for all species)
New World Warblers		
Ovenbird	*Seiurus aurocapillus*	UHF, UMW, AF
Worm-eating Warbler	*Helmitheros vermivora*	UHF, UMW
Louisiana Waterthrush	*Parkesia motacilla*	AF, FS
Northern Waterthrush	*Parkesia noveboracensis*	AF, FS
Golden-winged Warbler	*Vermivora chrysoptera*	UHF, UMW
Blue-winged Warbler	*Vermivora cyanoptera*	UMW
Blue-winged Warbler	*Vermivora cyanoptera*	UMW
Black-and-white Warbler	*Mniotilta varia*	MTC
Prothonotary Warbler	*Protonotaria citrea*	FS
Swainson's Warbler	*Limnothlypis swainsonii*	AF, FS
Tennessee Warbler	*Leiothlypis peregrina*	UHF
Orange-crowned Warbler	*Leiothlypis celata*	UHF, UMW
Nashville Warbler	*Leiothlypis ruficapilla*	MTC
Kentucky Warbler	*Geothlypis formosus*	UHF
Common Yellowthroat	*Geothlypis trichas*	MF, FM, FS
Hooded Warbler	*Setophaga citrina*	UHF, UMW, AF
American Redstart	*Setophaga ruticilla*	SH, UHF, UMW, AF
Cape May Warbler	*Setophaga tigrina*	UHF
Northern Parula	*Setophaga americana*	MTC
Magnolia Warbler	*Setophag magnolia*	UHF, AF
Bay-breasted Warbler	*Setophaga castanea*	UHF, AF
Blackburnian Warbler	*Setophaga fusca*	SH, UMW
Yellow Warbler	*Setophaga petechia*	FM
Chestnut-sided Warbler	*Setophaga pensylvanica*	UHF, UMW
Blackpoll Warbler	*Setophaga striata*	SH, UHF, UMW
Black-throated Blue Warbler	*Setophaga caerulescens*	UHF, AF
Palm Warbler	*Setophaga palmarum*	SH, UMW
Pine Warbler	*Setophaga pinus*	MF, SH, UMW
Yellow-rumped Warbler	*Setophagacoronata*	MTC
Yellow-throated Warbler	*Setophagadominica*	MF, SH, UMW
Prairie Warbler	*Setophaga discolor*	SH, UMW
Black-throated Green Warbler	*Setophaga virens*	UHF, AF
Cardinals, Grosbeaks, and Buntings		
Summer Tanager	*Piranga olivacea*	SH, UP
Scarlet Tanager	*Piranga olivacea*	UHF, UMW
Northern Cardinal	*Cardinalis cardinalis*	MTC
Rose-breasted Grosbeak	*Pheucticus ludovicianus*	UHF, UP, AF
Blue Grosbeak	*Passerina caerulea*	SH
Indigo Bunting	*Passerina cyanea*	SH, UP, FM

Common Name	*Scientific Name*	Primary Habitat Codes (for all species)

MAMMALS

Didelphids

Opossum	*Didelphis virginiana*	MTC

Insectivores

Short-tailed Shrew	*Blarina carolinensis*	UHF
Eastern Mole	*Scalopus aquaticus*	UHF, SH, UP
Southeastern Shrew	*Sorex longirostris*	UHF

Bats

Big Brown Bat	*Eptesicus fuscus*	UHF, OF
Seminole Bat	*Lasiurus seminolus*	UHF, OF
Southeastern Myotis	*Myotis austroriparius*	MTC, OF
Evening Bat	*Nycticeius humeralis*	UHF, OF
Tricolored Bat	*Perimyotis subflavus*	UHF, OF
Brazilian Free-tailed Bat	*Tadarida brasiliensis*	UHF, OF

Edentates

Nine-banded Armadillo	*Dasypus novemcinctus* *	MTC

Lagomorphs

Eastern Cottontail	*Sylvilagus floridanus*	MTC
Marsh Rabbit	*Sylvilagus palustris*	FM

Rodents

Beaver	*Castor canadensis*	FM, SRST
Southeastern Pocket Gopher	*Geomys pinetis*	SH
Southern Flying Squirrel	*Glaucomys volans*	MTC
Capybara	*Hydrochaeris hydrochaeris* *	FS, SRST
House Mouse	*Mus musculus* *	DV
Eastern Woodrat	*Neotoma floridana*	UHF
Golden Mouse	*Ochrotomys nuttalli*	UHF
Rice Rat	*Oryzomys palustris*	FM
Cotton Mouse	*Peromyscus gossypinus*	UHF,UMW
Oldfield Mouse	*Peromyscus polionotus*	SH
Florida Mouse	*Podomys floridanus*	SH
Black Rat	*Rattus rattus* *	MTC
Gray Squirrel	*Sciurus carolinensis*	MTC
Southern Fox Squirrel	*Sciurus niger niger*	SH
Hispid Cotton Rat	*Sigmodon hispidus*	SH, UP

Carnivores

Coyote	*Canis latrans* *	MTC
Domestic Cat	*Felis catus* *	MTC
River Otter	*Lutra canadensis*	FS, SRST

Ichetucknee Springs State Park Animals

Common Name	*Scientific Name*	Primary Habitat Codes (for all species)
Bobcat	*Lynx rufus*	MTC
Striped Skunk	*Mephitis mephitis*	MTC
Long-tailed Weasel	*Mustela frenata*	AF, FS
Raccoon	*Procyon lotor*	MTC
Gray Fox	*Urocyon cinereoargenteus*	SH, UP
Florida Black Bear	*Ursus americanus floridanus*	MTC
Red Fox	*Vulpes vulpes*	UHF
Manatees		
West Indian Manatee	*Trichechus manatus*	SRST
Artiodactyls		
White-tailed Deer	*Odocoileus virginianus*	MTC
Wild Pig	*Sus scrofa* *	MTC

*** Non-native Species** **+ Extirpated**

TERRESTRIAL

Beach Dune....BD
Coastal Berm....CB
Coastal Grassland....CG
Coastal Strand....CS
Dry Prairie....DP
Keys Cactus Barren....KCB
Limestone Outcrop....LO
Maritime Hammock....MAH
Mesic Flatwoods....MF
Mesic Hammock....MEH
Pine Rockland....PR
Rockland Hammock....RH
Sandhill....SH
Scrub....SC
Scrubby Flatwoods....SCF
Shell Mound....SHM
Sinkhole....SK
Slope Forest....SPF
Upland Glade....UG
Upland Hardwood Forest....UHF
Upland Mixed Woodland....UMW
Upland Pine....UP
Wet Flatwoods....WF
Xeric Hammock....XH

PALUSTRINE

Alluvial Forest....AF
Basin Marsh....BM
Basin Swamp....BS
Baygall....BG
Bottomland Forest....BF
Coastal Interdunal Swale....CIS
Depression Marsh....DM
Dome Swamp....DS
Floodplain Marsh....FM
Floodplain Swamp....FS
Glades Marsh....GM
Hydric Hammock....HH
Keys Tidal Rock Barren....KTRB
Mangrove Swamp....MS
Marl Prairie....MP
Salt Marsh....SAM
Seepage Slope....SSL
Shrub Bog....SHB
Slough....SLO
Slough Marsh....SLM
Strand Swamp....STS
Wet Prairie....WP

LACUSTRINE

Clastic Upland Lake ..... CULK
Coastal Dune Lake..... CDLK
Coastal Rockland Lake ..... CRLK
Flatwoods/Prairie ..... FPLK
Marsh Lake ..... MLK
River Floodplain Lake ..... RFLK
Sandhill Upland Lake ..... SULK
Sinkhole Lake ..... SKLK
Swamp Lake..... SWLK

RIVERINE

Alluvial Stream ..... AST
Blackwater Stream ..... BST
Seepage Stream ..... SST
Spring-run Stream ..... SRST

SUBTERRANEAN

Aquatic Cave ..... ACV
Terrestrial Cave ..... TCV

ESTUARINE

Algal Bed ..... EAB
Composite Substrate..... ECPS
Consolidated Substrate ..... ECNS
Coral Reef..... ECR
Mollusk Reef..... EMR
Octocoral Bed ..... EOB
Seagrass Bed ..... ESGB
Sponge Bed..... ESPB
Unconsolidated Substrate ..... EUS
Worm Reef..... EWR

MARINE

Algal Bed ..... MAB
Composite Substrate..... MCPS
Consolidated Substrate ..... MCNS
Coral Reef..... MCR
Mollusk Reef..... MMR
Octocoral Bed ..... MOB
Seagrass Bed ..... MSGB
Sponge Bed..... MSPB
Unconsolidated Substrate ..... MUS
Worm Reef..... MWR

ALTERED LANDCOVER TYPES

Abandoned field ..... ABF
Abandoned pasture..... ABP
Agriculture .....AG
Canal/ditch .....CD
Clearcut pine plantation ..... CPP
Clearing..... CL
Developed.....DV
Impoundment/artificial pond .....IAP
Invasive exotic monoculture..... IEM
Pasture - improved.....PI
Pasture - semi-improved .....PSI
Pine plantation..... PP
Road .....RD
Spoil area .....SA
Successional hardwood forest..... SHF
Utility corridor .....UC

MISCELLANEOUS

Many Types of Communities.....MTC
Overflying .....OF

Addendum 6—Imperiled Species Ranking Definitions

The Nature Conservancy and the Natural Heritage Program Network (of which FNAI is a part) define an element as any exemplary or rare component of the natural environment, such as a species, natural community, bird rookery, spring, sinkhole, cave or other ecological feature. An element occurrence (EO) is a single extant habitat that sustains or otherwise contributes to the survival of a population or a distinct, self-sustaining example of a particular element.

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

Federal and State status information is from the U.S. Fish and Wildlife Service; and the Florida Fish and Wildlife Conservation Commission (animals), and the Florida Department of Agriculture and Consumer Services (plants), respectively.

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 fabricated 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 or local throughout its range (21-100 occurrences or less than 10,000 individuals) or found locally in a restricted range or vulnerable to extinction of other factors.

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

G5 ..... demonstrably secure globally

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

GX ..... believed to be extinct throughout range

GXC ..... extirpated from the wild but still known from captivity 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)
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 or local throughout its range (21-100 occurrences or less than 10,000 individuals) or found locally in a restricted range or vulnerable to extinction of 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
SU ..... due to lack of information, no rank or range can be assigned (e.g., SUT2).
S?..... Not yet ranked (temporary)
N ..... Not currently listed, nor currently being considered for listing, by state or federal agencies.

LEGAL STATUS

FEDERAL

(Listed by the U. S. Fish and Wildlife Service - USFWS)

LE ..... Listed as Endangered Species in the List of Endangered and Threatened Wildlife and Plants under the provisions of the Endangered Species Act. Defined as any species that is in danger of extinction throughout all or a significant portion of its range.
PE ..... Proposed for addition to the List of Endangered and Threatened Wildlife and Plants as Endangered Species.
LT ..... Listed as Threatened Species. Defined as any species that is likely to become an endangered species within the near future throughout all or a significant portion of its range.

PT ..... Proposed for listing as Threatened Species.
C ..... Candidate Species for addition to the list of Endangered and Threatened Wildlife and Plants. Defined as those species for which the USFWS currently has on file sufficient information on biological vulnerability and threats to support proposing to list the species as endangered or threatened.
E(S/A) ..... Endangered due to similarity of appearance.
T(S/A) ..... Threatened due to similarity of appearance.
EXPE, XE..... Experimental essential population. A species listed as experimental and essential.
EXPN, XN .... Experimental non-essential population. A species listed as experimental and non-essential. Experimental, nonessential populations of endangered species are treated as threatened species on public land, for consultation purposes.

STATE

ANIMALS .. (Listed by the Florida Fish and Wildlife Conservation Commission - FWC)

FE ..... Federally-designated Endangered

FT ..... Federally-designated Threatened

FXN..... Federally-designated Threatened Nonessential Experimental Population

FT(S/A) ..... Federally-designated Threatened species due to similarity of appearance

ST..... Listed as Threatened Species by the FWC. Defined as a species, subspecies, or isolated population, which is acutely vulnerable to environmental alteration, declining in number at a rapid rate, or whose range or habitat, is decreasing in area at a rapid rate and therefore is destined or very likely to become an endangered species within the near future.
SSC..... Listed as Species of Special Concern by the FWC. Defined as a population which warrants special protection, recognition or consideration because it has an inherent significant vulnerability to habitat modification, environmental alteration, human disturbance or substantial human exploitation that, in the near future, may result in its becoming a threatened species.

PLANTS .... (Listed by the Florida Department of Agriculture and Consumer Services - FDACS)

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

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

Addendum 7—Cultural Information

These procedures apply to state agencies, local governments, and non-profits that manage state-owned properties.

A. General Discussion

Historic resources are both archaeological sites and historic structures. Per Chapter 267, Florida Statutes, '*Historic property' or 'historic resource' means any prehistoric district, site, building, object, or other real or personal property of historical, architectural, or archaeological value, and folklife resources. These properties or resources may include, but are not limited to, monuments, memorials, Indian habitations, ceremonial sites, abandoned settlements, sunken or abandoned ships, engineering works, treasure trove, artifacts, or other objects with intrinsic historical or archaeological value, or any part thereof, relating to the history, government, and culture of the state."*

B. Agency Responsibilities

Per State Policy relative to historic properties, state agencies of the executive branch must allow the Division of Historical Resources (Division) the opportunity to comment on any undertakings, whether these undertakings directly involve the state agency, i.e., land management responsibilities, or the state agency has indirect jurisdiction, i.e. permitting authority, grants, etc. No state funds should be expended on the undertaking until the Division has the opportunity to review and comment on the project, permit, grant, etc.

State agencies shall preserve the historic resources which are owned or controlled by the agency.

Regarding proposed demolition or substantial alterations of historic properties, consultation with the Division must occur, and alternatives to demolition must be considered.

State agencies must consult with Division to establish a program to location, inventory and evaluate all historic properties under ownership or controlled by the agency.

C. Statutory Authority

Statutory Authority and more in depth information can be found at:
http://www.flheritage.com/preservation/compliance/guidelines.cfm

D. Management Implementation

Even though the Division sits on the Acquisition and Restoration Council and approves land management plans, these plans are conceptual. Specific information regarding individual projects must be submitted to the Division for review and recommendations.

Managers of state lands must coordinate any land clearing or ground disturbing activities with the Division to allow for review and comment on the proposed project. Recommendations may include, but are not limited to: approval of the project as submitted, cultural resource assessment survey by a qualified professional archaeologist, modifications to the proposed project to avoid or mitigate potential adverse effects.

Projects such as additions, exterior alteration, or related new construction regarding historic structures must also be submitted to the Division of Historical Resources for review and comment by the Division's architects. Projects involving structures fifty years of age or older, must be submitted to this agency for a significance determination. In rare cases, structures under fifty years of age may be deemed historically significant. These must be evaluated on a case by case basis.

Adverse impacts to significant sites, either archaeological sites or historic buildings, must be avoided. Furthermore, managers of state property should make preparations for locating and evaluating historic resources, both archaeological sites and historic structures.

E. Minimum Review Documentation Requirements

In order to have a proposed project reviewed by the Division, certain information must be submitted for comments and recommendations. The minimum review documentation requirements can be found at:http://www.flheritage.com/preservation/compliance/docs/minimum_review_documentation_requirements.pdf.

* * *

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

Deena S. Woodward
Division of Historical Resources
Bureau of Historic Preservation
Compliance and Review Section
R. A. Gray Building
500 South Bronough Street
Tallahassee, FL 32399-0250

Phone: (850) 245-6425

Toll Free: (800) 847-7278
Fax: (850) 245-6435

The criteria to be used for evaluating eligibility for listing in the National Register of Historic Places are as follows:

1) Districts, sites, buildings, structures, and objects may be considered to have significance in American history, architecture, archaeology, engineering, and/or culture if they possess integrity of location, design, setting, materials, workmanship, feeling, and association, and:

- **a)** are associated with events that have made a significant contribution to the broad patterns of our history; and/or
- **b)** are associated with the lives of persons significant in our past; and/or
- **c)** embody the distinctive characteristics of type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction; and/or
- **d)** have yielded, or may be likely to yield, information important in prehistory or history.

2) Ordinarily cemeteries, birthplaces, or graves of historical figures; properties owned by religious institutions or used for religious purposes; structures that have been moved from their original locations; reconstructed historic buildings; properties primarily commemorative in nature; and properties that have achieved significance within the past 50 years shall not be considered eligible for the *National Register*. However, such properties will qualify if they are integral parts of districts that do meet the criteria or if they fall within the following categories:

- **a)** a religious property deriving its primary significance from architectural or artistic distinction or historical importance; or
- **b)** a building or structure removed from its original location but which is significant primarily for architectural value, or which is the surviving structure most importantly associated with a historic person or event; or
- **c)** a birthplace or grave of an historical figure of outstanding importance if there is no appropriate site or building directly associated with his productive life; or
- **d)** a cemetery which derives its primary significance from graves of persons of transcendent importance, from age, distinctive design features, or association with historic events; or

e) a reconstructed building, when it is accurately executed in a suitable environment and presented in a dignified manner as part of a restoration master plan, and no other building or structure with the same association has survived; or a property primarily commemorative in intent, if design, age, tradition, or symbolic value has invested it with its own exceptional significance; or

f) a property achieving significance within the past 50 years, if it is of exceptional importance.

Restoration is defined as the act or process of accurately depicting the form, features, and character of a property as it appeared at a particular period of time by means of the removal of features from other periods in its history and reconstruction of missing features from the restoration period. The limited and sensitive upgrading of mechanical, electrical and plumbing systems and other code-required work to make properties functional is appropriate within a restoration project.

Rehabilitation is defined as the act or process of making possible a compatible use for a property through repair, alterations and additions while preserving those portions or features that convey its historical, cultural or architectural values.

Stabilization is defined as the act or process of applying measures designed to reestablish a weather resistant enclosure and the structural stability of an unsafe or deteriorated property while maintaining the essential form as it exists at present.

Preservation is defined as the act or process of applying measures necessary to sustain the existing form, integrity and materials of an historic property. Work, including preliminary measures to protect and stabilize the property, generally focuses upon the ongoing maintenance and repair of historic materials and features rather than extensive replacement and new construction. New exterior additions are not within the scope of this treatment; however, the limited and sensitive upgrading of mechanical, electrical and plumbing systems and other code-required work to make properties functional is appropriate within a preservation project.

Addendum 8 —Timber Management Analysis

Ichetucknee Springs State Park
McCormick Sink Tract
Timber Assessment

Prepared By:
Doug Longshore
Senior Forester, Other State Lands, Region 2
Florida Division of Forestry
May 29, 2008

I. Purpose

This document is intended to fulfill the timber assessment requirement for the McCormick Sink Tract 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.

II. Background

The McCormick Sink Tract, comprised of 150 acres, was purchased by the Trust for Public Lands in 2005 from the McCormick family who had owned it since 1947. They farmed portions of this tract during this time and subsequently planted pines on the former agricultural fields.

This property was purchased for management as part of Ichetucknee Springs State Park in order to protect this section of the Ichetucknee Trace which lies above a portion of the underground cave system that feeds the Ichetucknee River. It was also purchased to specifically protect McCormick Sink which connects directly to the underground conduits.

Historically, this tract was upland hardwood and upland pine hardwood. Much of the upland pine hardwood areas have been severely impacted by agricultural land clearing activities that took place in the late 1930's and early 1940's. In addition, fire exclusion from the area as a whole, has had a negative impact on the health and vigor of the natural communities.

Presently, the tract is comprised of 73 acres of planted slash pine in two distinct age classes. Eleven acres is approximately 25 years old. The remaining 62 acres is approximately 18 years old. All of the slash pine is growing on former agricultural fields. As evidenced by the old stump rows found in the existing plantation, this is the second crop of trees to have been grown on these "old fields". The remaining 77 acres is comprised of upland hardwood. Timber management guidelines are not included for the upland hardwood areas. No forestry activities are planned for these areas as they are a primary buffer for the numerous sinkholes found in the area.

III. Goals and Objectives Related to Timber Management

The following are Goals and Objectives as outlined in the Ichetucknee Springs Unit Management Plan that relate directly to timber management.

1. Restore natural communities within the park
2. Create or improve perimeter and internal firebreaks where necessary in order to introduce prescribed fire to the upland pine forest.

IV. General Management Guidelines

Basal Area per acre (BA) will be the primary measurement tool in providing management recommendations for thinning of appropriate pine plantations on the McCormick tract. BA is the cross sectional area (in square feet) of a tree measured four and one-half feet above the ground. (Diameter of trees measured at this height is referred to as its diameter at breast height or DBH). BA can be used to define stocking rates in determining the timing and rate of a thinning treatment. Fully-stocked pine stands have enough trees per acre of a size or sizes larger enough to utilize growing space without causing overcrowding, which can lead to an increased risk of insect and disease mortality. Longleaf, slash and sand pine stands with 70 to 100 square feet of BA are considered fully stocked. It requires more, smaller diameter trees than larger diameter trees to equal one square foot of BA. (For example: It takes 357 evenly spaced six-inch dbh trees to equal 70 square R of BA, whereas only 89 twelve-inch dbh trees per acre equal the same 70 square feet of BA)

The average BA for the 25 year old slash pine is 120 square feet per acre. The 18 year old slash pine averages 100 square feet per acre. The variation in stocking rates is due in part to differences in site quality (second crop of trees), but also from survival rates of plantings, and the amount of trees that have naturally succumbed to fusiform rust and stand competition. Basal area can be roughly correlated to crown density, and therefore to needle-cast. Generally, 40 to 60 square feet of BA should provide enough needle-cast to carry prescribed fire and adequate sunlight for maintenance of natural grass communities.

Thinning type harvests in pine plantations help in maintaining the health and vigor of the stands by removing diseased, severely suppressed, and deformed trees. Properly applied thinnings are also useful in enhancing the development of understory and groundcover communities which can provide a diversity of habitat for a wide variety of wildlife species. Initial thinning methods would remove every third or fifth row of pines, and selective harvesting of forked, diseased and suppressed in the intermediate rows (third-row select or fifth-row select). A small percentage of co-dominant trees need to be harvested also to meet the desired residual BA. Stand BA's should be reduced to approximately 70-80 square feet per acre (dependent on BA before treatment) during initial treatment, and thinned again whenever they contain >I00 square feet of BA per acre. A general recommendation in southern pine stands is to remove no more than a third of the

existing BA per acre during one treatment (For example: In a stand with 150 of square feet of BA, thin back to 100 square eet of BA per acre). This will help to minimize windthrow damage in residual trees.

V. Recommendations

The majority of pine stand acreage on McCormick Sink Tract is comprised of two major age classes. The primary focus in forest management methods will consist of implementing various silvicultural methods in these pine plantations for the purpose of maintaining the health and vigor of the existing stand and eventually reestablishing natural community types.

The use of prescribed fire in all of these pine plantations is a necessary tool for reestablishing natural overstory and groundcover communities. All planted pine stands should be prescribed burned to reduce the shading effects of excessive hardwood stems and reduce fuels.

A. Slash Pine

Timber Management

The slash pine plantations for the most part are well-stocked, although hardwood competition is a problem throughout much of these stands. Most of these areas are well-suited to a third-row select thinning, although it will be necessary to control existing hardwoods with herbicides and/or prescribed burning within several years after thinning operations have been completed. Thinnings can be done in the slash pine stands to promote groundcover restoration and gopher tortoise habitat, with a long-term goal of converting these stands to longleaf pine. During the initial thinning, clearcut a small, patchwork of openings throughout the stand. These openings would comprise approximately twenty five per cent of the total stand area, or approximately 20 acres. Properly located loading ramps and skid trails could be included in these planned openings.

These areas would later be cleared to allow mechanical seeding of native ground cover species and the planting of longleaf pine seedlings. These areas would later become the seed source for the natural seeding of adjacent areas.

VI. Prescribed Burning

There was no evidence of recent fires on the McCormick Sink Tract As a result, groundcover conditions have deteriorated, and hardwood competition is moderate-heavy throughout most of the pine stands. Prescribed burning is an essential land management tool for restoring and maintaining Florida's natural pine communities Properly applied prescribed burns provide many benefits: Reduction of wildfire hazard, groundcover restoration, hardwood and woody shrub control, wildlife

habitat improvement, and overall more natural open-stand conditions. Firelines should be reestablished and possibly relocated further away from sinkholes. Winter prescribed burns should initially be conducted in pine stands. Upon completion of the thinning operation, a shift to growing season burns could then be made.

VII. Summary

The McCormick Sink Tract has potential for natural community restoration. This will be a long term process and require a commitment to prescribe burning on a regular basis. Overall the site contains moderate timber values for existing merchantable slash pine stands. As a result, there should be no problem in soliciting N. Florida market value timber sales as long as they are properly planned and implemented. Proper timber management of these stands will provide revenues that can be used for other management activities that hat included the Conceptual Management Plan for this property.

Addendum 9 —Land Management Review

FLORIDA DEPARTMENT OF ENVIRONMENTAL PROTECTION

MEMORANDUM

TO: Keith Singleton, Program Consultant
Division of State Lands

FROM: Wes Howell, Acting Chief, Bureau of Natural and Cultural Resources
Division of Recreation and Parks

Steve Cutshaw, Chief, Office of Park Planning
Division of Recreation and Parks

SUBJECT: Response to Draft Land Management Review (LMR)
Ichetucknee Springs State Park

The Land Management Review draft report provided to Division of Recreation and Parks (DRP) determined that management of Ichetucknee Springs State Park by the DRP met the two tests prescribed by law. Namely, the review team concluded that the land is being managed for the purposes for which it was acquired and in accordance with the land management plan.

Attached is DRP's Managing Agency Response to the draft LMR report. The responses were prepared via a coordinated effort of the park, district office, and our offices.

Thank you for your attention.

/ca

2017 Land Management Review Team Report for Ichetucknee Springs State Park

Table of Contents

1. Introduction

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

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

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

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

1.1. Property Reviewed in this Report

Name of Site: Ichetucknee Springs State Park

Managed by: Florida Department of Environmental Protection – Division of Recreation and Parks

Acres: 2,518.49 **County:** Columbia, Suwannee

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

Acquisition Program(s): EEL, CARL/P2000 **Original Acquisition Date:**

Area Reviewed: Entire Property **Last Management Plan Approval Date:** 10/17/00

Review Date: 10/18/17

Agency Manager and Key Staff Present:

- Bob Soderholm, Park Manager
- Craig Parenteau, D2, FPS
- Sam Cole, D2, FPS
- Dan Pearson, D2, FPS

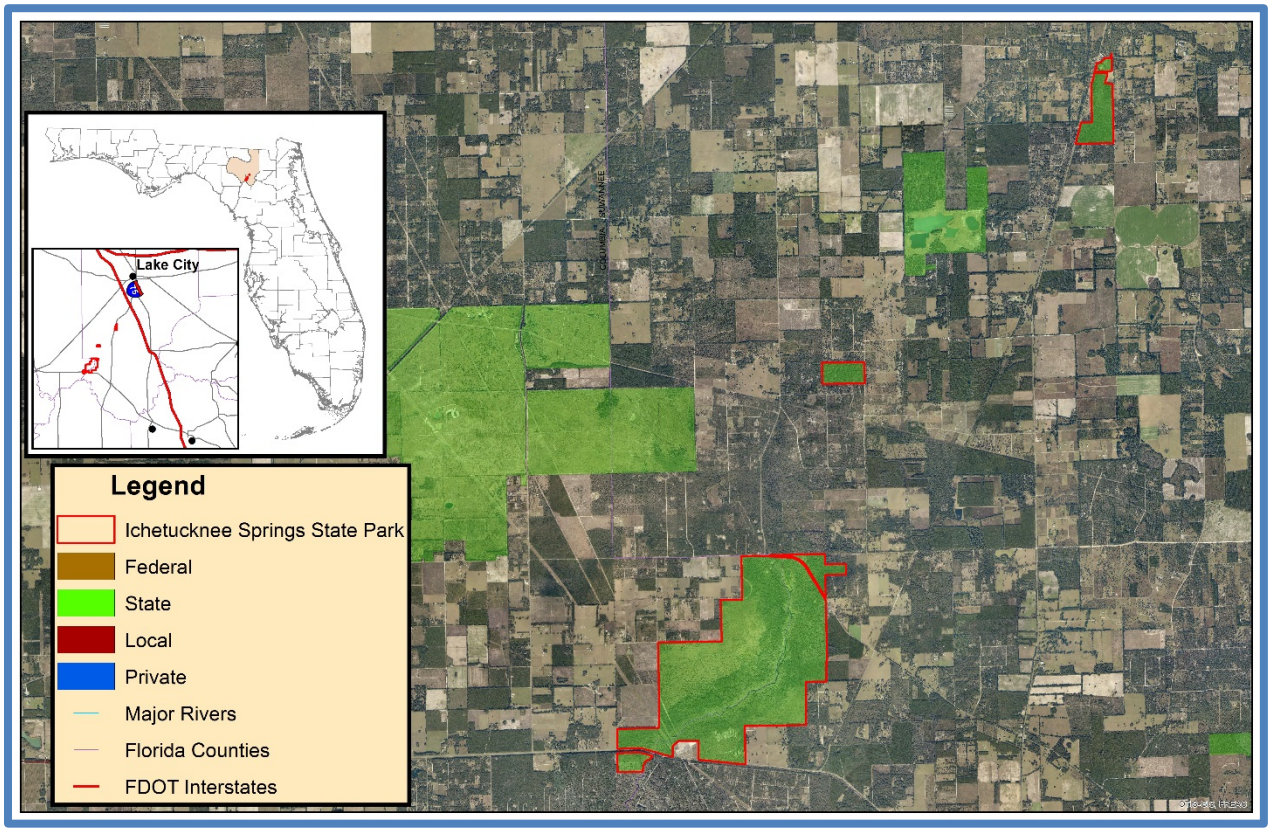
Review Team Members Present (voting)

- Rick Owen, D2, FPS
- Jim Stevenson, Local
- Ginger Morgan, FWC
- Jason Newman, FDEP-NED
- Doug Longshore, FFS
- Catherine Bowman, Conservation Org.
- Ronald Blair, Private Land Manager

Other Non-Team Members Present (attending)

- James Parker, DEP/DSL
- Keith Singleton, DEP/DSL

1.2 Property Map



1.3. Overview of Land Management Review Results

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

Yes = 7, No = 0

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

Yes = 7, No = 0

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

Table 1: Results at a glance.

Major Land Management Categories	Field Review	Management Plan Review
Natural Communities / Forest Management	4.49	4.66
Prescribed Fire / Habitat Restoration	3.74	4.44
Hydrology	4.73	4.67
Imperiled Species	4.86	5.00
Exotic / Invasive Species	4.29	4.60
Cultural Resources	4.86	5.00
Public Access / Education / Law Enforcement	4.52	4.66
Infrastructure / Equipment / Staffing	3.81	N/A
Color Code (See Appendix A for detail)		
Excellent	Above Average	Below Average	Poor

1.3.1 Consensus Commendations for the Managing Agency

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

1. The team commends the park staff for the great job with your "people management" and large numbers of park visitors. (7+, 0-)
2. The team commends park staff for the great work in making river access wheel chair accessible. (7+, 0-)
3. The team commends the Florida Park Service (FPS) for great work keeping invasive exotic species at maintenance levels. (7+, 0-)
4. The team commends the FPS for their great ongoing work with fire frequency and hardwood reduction in the sandhill plant community. (7+, 0-)
5. The team commends the park staff for the great job increasing interpretive activities and events (cultural and environmental), especially the youth involvement, into the park's operational calendar. (7+, 0-)
6. The team commends the park staff for the outstanding protection and interpretation of cultural and historical resources. (7+, 0-)
7. The team commends the FPS for the cooperation and innovative use of contracts with vendors for recreational opportunities while providing an orientation to the park operations. (7+, 0-)
8. The team commends DRP for for a thorough and well-written land management plan. (7+, 0-)

1.3.2. Consensus Recommendations to the Managing Agency

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

1. The team recommends that DRP work with the (SRWMD) to help promote the highest level of spring flow protection for the Ichetucknee system, and all priority springs, including ensuring access for manatees, through the MFL process. (7+, 0-)

   Managing Agency Response: ***Agree. The Division will continue to coordinate and seek guidance from the SRWMD concerning Minimum Flows and Levels for the Ichetucknee River, and similarly coordinate with FWC concerning continued unfettered manatee access to this important warm water refuge.***

2. The team recommends that the FPS add appropriate fencing as needed at Rose Sink and McCormick tracts to protect the resources. (7+, 0-)

   Managing Agency Response: ***Agree. The Division will protect resources on the Rose and McCormick tracts with appropriate boundary fencing.***

3. The team recommends that the FPS coordinate with FWC and USFWS to define the status of the Ichetuckee as a manatee wam water refugia/sanctuary in light of increasing numbers of manatees using this system. (7+, 0-)

   Managing Agency Response: ***Agree. The Division will cooperate with and follow the guidance of FWC and USFWS concerning manatee warm water refugia/sanctuary status for the Ichetucknee River.***

4. The team recommends that the DRP consider reallocating the 750 tubers from upper launch to the mid-point launch in order to reduce the substantial impacts on vegetaion, water clarity, and wildlife habitat in the sensitive upper river.. (7+, 0-)

   Managing Agency Response: ***Agree. In accordance with longstanding spring monitoring protocols, the Division will consider modifications to carrying capacities at each Unit Plan Update.***

2. Field Review Details

2.1 Field Review Checklist Findings

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

1. **Natural communities, specifically: Mesic Flatwoods, Mesic Hammock, Sandhill, Sinkhole / Sinkhole Lake, Upland Hardwood Forest, Upland Mixed Woodland/ Upland Pine, Dome Swamp, Alluvial Forest, Floodplain Marsh, Floodplain Swamp, Blackwater Stream, Spring-run Stream, Aquatic Cave**
2. **Listed species protection and preservation, specifically: Animals (listed animal species in general) Gopher Tortoise, Southeastern American Kestrel, Ichetucknee Siltsnail, Plants (listed plant species in general)**

3. **Natural Resources Survey/Management Listed species or their habitat monitoring, Other non-game species or their habitat monitoring, Fire effects monitoring, Other habitat management effects monitoring, Invasive species survey / monitoring**
4. **Cultural Resources (Archeological & Historic sites) specifically: Cultural Res. Survey, Protection and preservation**
5. **Prescribed fire, specifically area being burned, frequency and quality**:
6. **Restoration, specifically**; **Upland Pine/ Upland Mixed Woodland**
7. **Forest Management; Timber Inventory/Assessment, Timber Haresting**
8. **Non-Native,Invasive & Problem Species Prevention/Control, specifically Plants, Animals, pests/pathogens**
9. **Hydro-alteration, specifically roads and culverts.**:
10. **Ground water monitoring, specifically quality and quantity**:
11. **Resource protection, specifically boundary survey, gates and fencing, and signage**:
12. **Public Access, specifically; roads, parking and boat access**
13. **Environmental education and outreach relating to wildlife, invasive species, habitat management activities, interpretive facilities and signs, recreational opportunities and management of visitor impacts**:
14. **Managed Areas, specifically; Swimming, Tubing, Snorkeling, SCUBA Diving, Canoeing / Kayaking, Picnicking, Nature Study, Hiking, Bicycling**

2.2. Items Requiring Improvement Actions in the Field

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

1. ***The maintenance condition of the Natural Communities, specifically mesic flatwoods, and upland mixed woodland/ upland pine, received below average scores. The review team is asked to evaluate, based on their perspective, what percent of the natural community is in maintenance condition. The scores range from 1 to 5, with 1 being 0-20% in maintenance condition, 2 being 21-40%, 3 being 41-60%, 4 being 16-80% and 5 being 81-100%..***

   Managing Agency Response: ***Agree. The Division will work towards increasing the acreage of these natural communities in maintenance condition.***

2.3. Field Review Checklist and Scores

Field Review Item	Reference #	Anonymous Team Members								Average
		1	2	3	4	5	6	7	8	
Natural Communities (I.A)										
Mesic Flatwoods	I.A.1	3		3	3	2		2		2.60
Mesic Hammock	I.A.2	5	5	5	5	5	5	5		5.00
Sandhill	I.A.3	5	4	4	4	4	5	4		4.29
Sinkhole / Sinkhole Lake	I.A.4	5		4	5	5	5	5		4.83
Upland Hardwood Forest	I.A.5	5	5	5	3	5	5	5		4.71

Upland Mixed Woodland/ Upland Pine	I.A.6	2	2	2	2	2	5	2		2.43
Dome Swamp	I.A.8	5	4	4	4	4	4	4		4.14
Alluvial Forest	I.A.9	5	5	5	5	5	5	5		5.00
Floodplain Marsh	I.A.10	5	5	5	4	5	5	5		4.86
Floodplain Swamp	I.A.11	5	5	5	5	5	5	5		5.00
Blackwater Stream	I.A.12	5		5	4	5		5		4.80
Spring-run stream	I.A.13	4	5	5	5	4		3		4.33
Aquatic Cave	I.A.14	5		5	5	5	5	5		5.00
								Natural Communities Average Score		4.38
Listed species:Protection & Preservation (I.B)										
Animals (listed animal species in general)	I.B.1	5		5	5	4	5			4.80
Gopher Tortoise	I.B.1.a	5	5	5	5	5	5	5		5.00
Southeastern American Kestrel	I.B.1.b	5	5	5	5	5	5	4		4.86
Ichetucknee Siltsnail	I.B.1.c	5	5	5	5	5	5	5		5.00
Plants (listed plant species in general)	I.B.2	5	4	5	5	4		5		4.67
								Listed Species Average Score		4.86
Natural Resources Survey/Management Resources (I.C)										
Listed species or their habitat monitoring	I.C.2	5	4	5	5	5	2	5		4.43
Other non-game species or their habitat monitoring	I.C.3	5	4	4	4	5		5		4.50
Fire effects monitoring	I.C.4	5	4	5	5	5	4	4		4.57
Other habitat management effects monitoring	I.C.5	5	4	5	4	5	4	5		4.57
Invasive species survey / monitoring	I.C.6	5	5	5	5	5	3	5		4.71
Cultural Resources (Archeological & Historic sites) (II.A, II.B)										
Cultural Res. Survey	II.A	5	5	5	5	5	4	5		4.86
Protection and preservation	II.B	5	5	5	5	5	4	5		4.86
								Cultural Resources Average Score		4.86
Resource Management, Prescribed Fire (III.A)										
Area Being Burned (no. acres)	III.A1	4	4	5	5	5	4	5		4.57
Frequency	III.A.2	3	4	4	4	4	4	4		3.86
Quality	III.A.3	4	4	4	4	4	4	4		4.00
								Resource Management, Prescribed Fire Average Score		4.14
Upland Pine / Upland Mixed Woodland	III.B.2	2	3	4	4	3		4		3.33
								Restoration Average Score		3.33
Forest Management (III.C)										
Timber Inventory / Assessment	III.C.1	4		4	5	5		5		4.60
Timber Harvesting	III.C.2	4		4	5	5		5		4.60
								Forest Management Average Score		4.60
Non-Native, Invasive & Problem Species (III.D)										
Prevention										
prevention - plants	III.D.1.a	3	5	5	5	4	5	4		4.43
prevention - animals	III.D.1.b	4	4	5	5	4	5	4		4.43

prevention - pests/pathogens	III.D.1.c	4	3	5	5	4		3		4.00
Control										
control - plants	III.D.2.a	5	4	5	5	4	3	4		4.29
control - animals	III.D.2.b	5	4	5	5	4	3	4		4.29
control - pest/pathogens	III.D.2.c	5	3	5	5	4		4		4.33
									Non-Native, Invasive & Problem Species Average Score	4.29
Hydrologic/Geologic function Hydro-Alteration (III.E.1)										
Roads/culverts	III.E.1.a	5	4	5	4	4		4		4.33
									Hydrologic/Geologic function, Hydro-Alteration Average Score	4.33
Ground Water Monitoring (III.E.2)										
Ground water quality	III.E.2.a	5	5	5	5	5	4	5		4.86
Ground water quantity	III.E.2.b	5	5	5	5	5	4	5		4.86
									Ground Water Monitoring Average Score	4.86
Surface Water Monitoring (III.E.3)										
Surface water quality	III.E.3.a	5	5	5	5	5		5		5.00
Surface water quantity	III.F.3.b	5	5	5	5	5		5		5.00
									Surface Water Monitoring Average Score	5.00
Resource Protection (III.F)										
Boundary survey	III.F.1			4	5	5	5	5		4.80
Gates & fencing	III.F.2	3	3	4	4	4		4		3.67
Signage	III.F.3		3	5	4	5		4		4.20
Law enforcement presence	III.F.4			4	4	5		5		4.50
									Resource Protection Average Score	4.29
Adjacent Property Concerns (III.G)										
Land Use										
Expanding development	III.G.1.a	5		4	4		4			4.25
Groundwater impacts	III.G.1.b	5	5	4	4	5	4			4.50
Inholdings/additions	III.G.2	4			4		4			4.00
Public Access & Education (IV.1, IV.2, IV.3, IV.4, IV.5)										
Public Access										
Roads	IV.1.a	5		5	4	5		5		4.80
Parking	IV.1.b	5		5	5	5		5		5.00
Boat Access	IV.1.c	5	3	4	4	3		5		4.00
Environmental Education & Outreach										
Wildlife	IV.2.a	5	5	5	5	5		5		5.00
Invasive Species	IV.2.b	5	5	5	5	5		5		5.00
Habitat Management Activities	IV.2.c	5	5	5	5	5		5		5.00
Interpretive facilities and signs	IV.3	5	5	5	5	5		3		4.67
Recreational Opportunities	IV.4	5	5	5	5	5		5		5.00
Management of Visitor Impacts	IV.5	4	5	5	4	5	2	5		4.29
									Public Access & Education Average Score	4.75
Management Resources (V.1, V.2, V.3. V.4)										
Maintenance										
Waste disposal	V.1.a	3		4	4	5	3	4		3.83
Sanitary facilities	V.1.b	3	5	5	5	4	3	4		4.14
Infrastructure										
Buildings	V.2.a	4		4	4	5	3	5		4.17

Equipment	V.2.b	4		4	5	5	3	5		4.33
Staff	V.3	3		4	4	4	1			3.20
Funding	V.4	3		4	4	4	1	3		3.17
									Management Resources Average Score	3.81

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

3. Land Management Plan Review Details

3.1 Items Requiring Improvements in the Management Plan

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

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

3.2 Management Plan Review Checklist and Scores

Plan Review Item	Reference #	Anonymous Team Members								Average
		1	2	3	4	5	6	7	8	
Natural Communities (I.A)										
Mesic Flatwoods	I.A.1	5	4	5	5	5	3	5		4.57
Mesic Hammock	I.A.2	5	4	5	5	5		5		4.83
Sandhill	I.A.3	5	5	5	5	5	5	5		5.00
Sinkhole / Sinkhole Lake	I.A.4	5	5	4	5	5		5		4.83
Upland Hardwood Forest	I.A.5	5	5	5	5	5	5	5		5.00
Upland Mixed Woodland/ Upland Pine	I.A.6	5	5	4	5	4	5	5		4.71
Dome Swamp	I.A.8	5	5	5	5	5	2	5		4.57
Alluvial Forest	I.A.9	5	5	5	5	5	3	5		4.71
Floodplain Marsh	I.A.10	5	5	5	5	5	4	5		4.86
Floodplain Swamp	I.A.11	5	5	5	5	5	5	5		5.00
Blackwater Stream	I.A.12	5	5	4	5	5		5		4.83
Spring-run stream	I.A.13	5	5	5	5	5		5		5.00
Aquatic Cave	I.A.14	5	5	4	5	5	5	5		4.86
									Natural Communities Average Score	4.83
Listed species: Protection & Preservation (I.B)										
Animals (listed animal species in general)	I.B.1	5	5	5	5	5		5		5.00
Gopher Tortoise	I.B.1.a	5	5	5	5	5	5	5		5.00
Southeastern American Kestrel	I.B.1.b	5	5	5	5	5	5	5		5.00
Ichetucknee Siltsnail	I.B.1.c	5	5	5	5	5	5	5		5.00
Plants (listed plant species in general)	I.B.2	5	5	5	5	5		5		5.00
									Listed Species Average Score	5.00

Natural Resources Survey/Management Resources (I.C)										
Listed species or their habitat monitoring	I.C.2	5	5	5	5	5	4	5		4.86
Other non-game species or their habitat monitoring	I.C.3	5	5	4	4	5	4	5		4.57
Fire effects monitoring	I.C.4	5	5	5	5	5	4	5		4.86
Other habitat management effects monitoring	I.C.5	5	5	5	4	5	4	5		4.71
Invasive species survey / monitoring	I.C.6	5	5	5	5	5	4	5		4.86
Cultural Resources (Archeological & Historic sites) (II.A,II.B)										
Cultural Res. Survey	II.A	5	5	5	5	5	5	5		5.00
Protection and preservation	II.B	5	5	5	5	5	5	5		5.00
								Cultural Resources Average Score		5.00
Resource Management, Prescribed Fire (III.A)										
Area Being Burned (no. acres)	III.A.1	5	4	5	5		5	5		4.83
Frequency	III.A.2	5	5	4	4		3	5		4.33
Quality	III.A.3	5	3	4	4		4	4		4.00
								Resource Management, Prescribed Fire Average Score		4.39
Restoration (III.B)										
Upland Pine / Upland Mixed Woodland	III.B.2	5	5	4	4	4		5		4.50
								Restoration Average Score		4.50
Forest Management (III.C)										
Timber Inventory / Assessment	III.C.1	5	5	4	4	5	3	5		4.43
Timber Harvesting	III.C.2	5	5	4	5	5	3	5		4.57
								Forest Management Average Score		4.50
Non-Native, Invasive & Problem Species (III.D)										
Prevention										
prevention - plants	III.D.1.a	5	4	5	5	4	5	5		4.71
prevention - animals	III.D.1.b	5	4	5	5	4	5	5		4.71
prevention - pests/pathogens	III.D.1.c	5	4	5	5	4		5		4.67
Control										
control - plants	III.D.2.a	5	4	5	5	4	3	5		4.43
control - animals	III.D.2.b	5	4	5	5	4	3	5		4.43
control - pest/pathogens	III.D.2.c	5	4	5	5	4		5		4.67
								Non-Native, Invasive & Problem Species Average Score		4.60
Hydrologic/Geologic function, Hydro-Alteration (III.E.1)										
Roads/culverts	III.E.1.a	5	4	4	5	5	1	5		4.14
								Hydrologic/Geologic function, Hydro-Alteration Average Score		4.14
Ground Water Monitoring (III.E.2)										
Ground water quality	III.E.2.a	5	5	5	5	5	4	5		4.86
Ground water quantity	III.E.2.b	5	5	5	5	5	4	5		4.86
								Ground Water Monitoring Average Score		4.86
Surface Water Monitoring (III.E.3)										
Surface water quality	III.E.3.a	5	5	5	5	5		5		5.00

Surface water quantity	III.E.3.b	5	5	5	5	5		5		5.00
								Surface Water Monitoring Average Score		5.00
Resource Protection (III.F)										
Boundary survey	III.F.1	5	4	5	5	5	5	5		4.86
Gates & fencing	III.F.2	4	4	5	5	5		5		4.67
Signage	III.F.3		3	5	5	5		4		4.40
Law enforcement presence	III.F.4		3	5	5	5		5		4.60
								Resource Protection Average Score		4.63
Adjacent Property Concerns (III.G)										
Land Use										
Expanding development	III.G.1.a	5	4	4	5		2			4.00
Groundwater impacts	III.G.1.b	5	5	4	5	5	4			4.67
Inholdings/additions	III.G.2	5	4	4						4.33
Discussion of Potential Surplus Land Determination	III.G.3	5	3	3	5	3	4	3		3.71
Surplus Lands Identified?	III.G.4	3	4	5	4	4	1	5		3.71
Public Access & Education (IV.1, IV.2, IV.3, IV.4, IV.5)										
Public Access										
Roads	IV.1.a	5		5	4	5		5		4.80
Parking	IV.1.b	5		5	5	5		5		5.00
Boat Access	IV.1.c	5	3	4	4	3		3		3.67
Environmental Education & Outreach										
Wildlife	IV.2.a	5	3	5	5	5		5		4.67
Invasive Species	IV.2.b	5	3	5	5	5		5		4.67
Habitat Management Activities	IV.2.c	5	3	5	5	5		5		4.67
Interpretive facilities and signs	IV.3	5	4	5	5	5		5		4.83
Recreational Opportunities	IV.4	5	5	5	5	5		5		5.00
Management of Visitor Impacts	IV.5	5	5	5	5	5	4	5		4.86
								Public Access & Education Average Score		4.68
Managed Area Uses (VI.A, VI.B)										
Existing Uses										
Swimming	VI.A.1	5	4	4	5	5	3	4		4.29
Tubing	VI.A.2	5	3	4	3	3	3	3		3.43
Snorkeling	VI.A.3	5	4	4	4	5	3	4		4.14
SCUBA Diving	VI.A.4	5	4	4	5	5	3	4		4.29
Canoeing / Kayaking	VI.A.5	5	5	4	5	5	5	5		4.86
Picnicking	VI.A.6	5	5	5	5	5	5	4		4.86
Nature Study	VI.A.7	5	5	5	5	5	5	5		5.00
Hiking	VI.A.8	5	5	5	5	5	5	5		5.00
Bicycling	VI.A.9	5	5	5	5	5	3	3		4.43
Proposed Uses										

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

Appendix A: Scoring System Detail

Explanation of Consensus Commendations:

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

Explanation of Consensus Recommendations:

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

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

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

Average scores are interpreted as follows:

Scores 4.0 to 5.0 are *Excellent*

Scores 3.0 to 3.99 are *Above Average*

Scores 2.0 to 2.99 are *Below Average*

Scores 1.0 to 1.99 are considered *Poor*

Addendum 10 —County Comprehensive Plan Compliance Review

From: Degagne, Demi [mailto:Demi.Degagne@dep.state.fl.us]
Sent: Thursday, January 7, 2021 9:34 AM
To: Brandon Stubbs <bstubbs@columbiacountyfla.com>
Cc: Laurie Hodson <laurie_hodson@columbiacountyfla.com>
Subject: Re: Request for County Comprehensive Plan Compliance Review - Ichetucknee Springs State Park Unit Management Plan

Good Morning Mr. Stubbs,

It has been close to a year since our office contacted you regarding the need to have Division of Recreation and Parks, Office of Park Planning's park unit management plans reviewed to determine if the park unit management plan is in compliance with the local comprehensive plan (a copy of previous communications is attached for reference). We are currently in need of a park unit management plan review. We will need to ensure we are accurately citing the future land use and zoning designations for the park and would like to confirm that our proposed developments in the conceptual land use section comply with those designations. In addition, the existing facilities section will also need to be reviewed.

Attached is a copy of the draft unit management plan for Ichetucknee Springs State Park. Please accept this as an official request for review of our park management plan to ensure compliance with your local comprehensive plan. Daniel Alsentzer, who is copied with this communication, is our point of contact regarding planning management of the Park.

Please confirm receipt of our request and advise, if possible, as to when we can expect the review to be completed. Thank you, in advance, for your time and assistance with our request.

Sincerely,
Demi Degagne
Office of Park Planning
FL Dept of Environmental Protection
Division of Recreation and Parks
850-245-3051

From: Degagne, Demi <Demi.Degagne@dep.state.fl.us>
Sent: Thursday, January 7, 2021 9:41 AM
To: ronaldm@suwcountyfl.gov <ronaldm@suwcountyfl.gov>
Cc: Alsentzer, Daniel <Daniel.Alsentzer@dep.state.fl.us>
Subject: Suwannee Co Request for Comprehensive Plan Compliance Review - Ichetucknee Springs State Park Unit Management Plan

Good Morning,

The Florida Department of Environmental Protection, Division of Recreation and Parks, Office of Park Planning is responsible for the unit management planning of all Florida State Parks. As part of this planning process, prior to the unit management plan being presented to its Acquisition and Restoration Council for consideration, the Office of Park Planning is required to connect and communicate with the area's agency that is responsible for the local comprehensive plan to determine if the park unit management plan complies with the county comprehensive plan. Specifically, we want to make sure we are accurately citing the future land use and zoning designations for the park and would like to confirm that our proposed developments in the conceptual land use section comply with those designations. The existing facilities section will also need to be reviewed.

Attached is a copy of the draft unit management plan for Ichetucknee Springs State Park. Please accept this as an official request for review of our park management plan to ensure compliance with your local comprehensive plan. Daniel Alsentzer, who is copied with this communication, is our point of contact regarding planning management of the Park.

Please confirm receipt of our request and advise, if possible, as to when we can expect the review to be completed. Thank you, in advance, for your time and assistance with our request.

Sincerely,
Demi Degagne
Office of Park Planning
FL Dept of Environmental Protection
Division of Recreation and Parks
850-245-3051