RUTH B. KIRBY GILCHRIST BLUE SPRINGS STATE PARK

Advisory Group Draft Unit Management Plan

Department of Environmental Protection
Division of Recreation and Parks
State of Florida
October 2019

RUTH B. KIRBY GILCHRIST BLUE SPRINGS STATE PARK UNIT MANAGEMENT PLAN EXECUTIVE SUMMARY

Florida's newest state park, Gilchrist Blue Springs is well-known for outstanding water clarity of its springs and renowned for its support of a diversity of wildlife species including turtles, fish and invertebrates.

FACTS AT A GLANCE

- Protects six known springs and 1.5 miles of the Santa Fe River
- Visitors can enjoy camping, paddling, swimming, and hiking.
- Became Florida's official 175th state park October of 2017
- The park's 69,141 annual visitors contributed over $5 million in direct economic impact.
- Located in Gilchrist County
- **Acreage**: 402.42 acres
- **Lease/Management Agreement Number(s)**: 4814
- Use: Single Use
- Designated Land Use: Public outdoor recreation and conservation is the designated single use of the property.
- Agency: Department of Environmental Protection Divison of Recreation and Parks
- Responsbility: Public Outdoor Recreation and Conservation
- Sublease: None
- Encumbrances: See Appendix 1 for details
- Type of Acquisition(s): Fee-simple, warranty deed with acquisition funded through the Florida Forever program, see Appendix 1 for details.

Natural Communities	Acres
Alluvial Forest	30.45
Bottomland Forset	37.07
Basin Swamp	0.20
Floodplain Swamp	24.19
Limestone Outcrop	0.07
Sandhill	177.37
Successional Hardwood Forest	40.30
Sinkhole	1.23
Sinkhole Lake	0.16
Upland Hardwood Forest	26.02
Abandoned Field/Pasture	31.57
Burrow Area	0.07
Developed	23.41
Utility Corridor	6.33

RUTH B. KIRBY GILCHRIST BLUE SPRINGS STATE PARK UNIT MANAGEMENT PLAN EXECUTIVE SUMMARY

BACKGROUND

On October 30, 2017, Ruth B. Kirby Gilchrist Blue Springs State Park officially opened as Florida's 175th state park. The purpose of this significant acquisition is to protect the water quality of Gilchrist Blue Spring and the park's other known springs; provide for the restoration and preservation of one of Florida's iconic natural spring ecosystems; and to preserve these unique resources for the perpetual enjoyment of future generations.

The park protects a group of significant springs that lay along the Santa Fe River, including two second magnitude springs, Gilchrist Blue Spring and Naked Spring. The Gilchrist Blue Spring run extends nearly one quarter mile in length and is one of the most significant spring runs in the Santa Fe Basin. The Gilchrist Blue Spring run and Naked Spring run were often recognized for their diverse and substantial "underwater forest" of submerged aquatic vegetation. Gilchrist Blue Spring is well known for its outstanding water clarity. Gilchrist Blue Spring and spring run provide important habitat for a diversity of freshwater turtle species including the imperiled Suwannee Alligator Snapping Turtle (*Macrochelys suwanniensis*).

The park also protects 1.5 miles of the shoreline of the Santa Fe River and supports a diversity of natural plant communities that characterize the Santa Fe River Basin and the region's underlying karst topography. This includes numerous limestone outcrops, sinkholes, and a wide forested floodplain dominated by large Bald cypress and swamp tupelo trees. The park also contains nearly 200 acres of remnant sandhill identified by large areas of native groundcover including wiregrass (*Aristida stricta var. beyrichiana*) a characteristic sandhill groundcover species.

Gilchrist Blue Springs has always been a popular local recreation spot. The late Ed C. Wright, a successful Florida businessman, gifted Gilchrist Blue Spring to Ruth B. Kirby, his longtime personal assistant and companion. Ms. Kirby enjoyed visiting the springs, and in the late 1950's, put in a wooden boardwalk, diving platform, and water access so the public could enjoy the springs as much as she did. She charged a 10-cent admission fee to help maintain the property. In 1971, she convinced her nephew, Harry Barr to move his family to Blue Springs and help her run the park. Ruth Kirby died in 1989 at age 78, and the Barr family continued to provide cautious management of the property's unique and fragile resources for over 40 years.

Today, paddling and swimming in the park's namesake spring and spring run stream remain popular activities. Park visitors can also enjoy camping, hiking, and picnicking. The park will continue to promote the sustainable use of one of Florida's exceptional spring ecosystems by preserving this quality example of traditional resource-based recreation.

RUTH B. KIRBY GILCHRIST BLUE SPRINGS STATE PARK UNIT MANAGEMENT PLAN EXECUTIVE SUMMARY

VISITOR USE MANAGEMENT

DRP wishes to respond to growing public concern over potential resource management impacts from high levels of visitation and popular recreational activities at some Florida State Parks. New research concerning visitor use management addresses the dynamic nature of visitor use, changing visitor preferences, and the importance of protecting the unique natural resources found within conservation lands. DRP completed research into alternative visitor management strategies and a new visitor use management strategy was developed. This new visitor use management strategy is intended to provide the greatest visitor capacity possible while sustaining natural and cultural resources and maintaining a quality visitor experience.

Through this strategy DRP will manage visitor use to sustain the quality of park resources and the visitor experience, consistent with the purposes of the park. This requires a deliberate and adaptive approach to managing resource impacts from recreational activity. This adaptive management framework is an iterative process in which management decisions are continuously informed and improved by monitoring resource conditions, application of management strategies, and making the necessary adjustments as appropriate. This new visitor use management program will rely on a variety of management tools and strategies rather than solely regulating the number of people within a park area.

RUTH B. KIRBY GILCHRIST BLUE SPRINGS STATE PARK UNIT MANAGEMENT PLAN EXECUTIVE SUMMARY

Monitoring

The goal of this new visitor use management program is to determine an acceptable level of impact that will not compromise the desired resource conditions. This management plan includes site-specific resource indicators and thresholds; based on potential visitor use impacts and then carefully selected to monitor resource conditions and the visitor experience. These indicators and thresholds will focus monitoring efforts and ensure management accountability. By monitoring conditions over time and clearly documenting when conditions become problematic, park management can implement programs to prevent or alleviate unacceptable conditions.

Initial monitoring will determine if the selected indicators are accurately measuring resource impacts and if the established thresholds are adequate to maintain the desired resource conditions. Revisions to the indicators and standards identified in this plan may be necessary during the first few years of monitoring. Additionally, if visitor use levels or visitor use patterns increase or change dramatically, new indicators and standards may need to be added.

Management Strategies

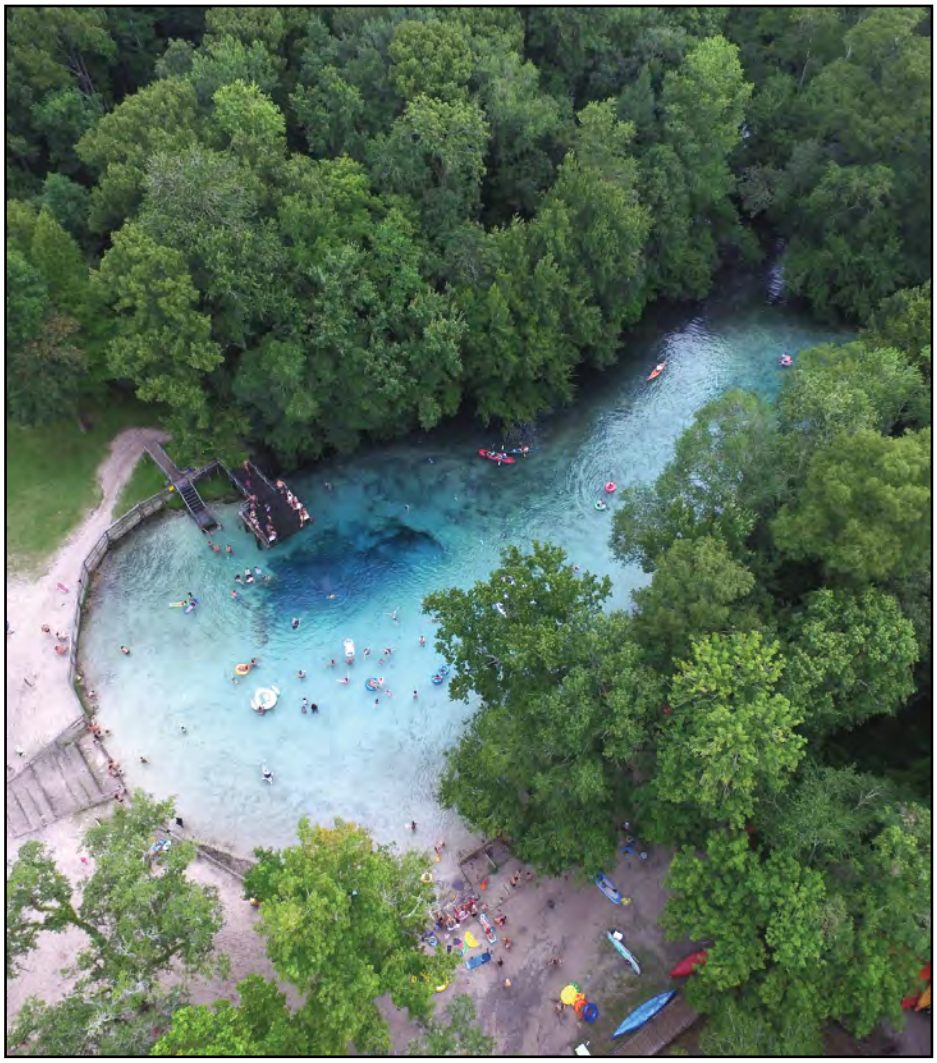
To determine the order and timing for the application of the proposed management strategies, DRP will analyze the issues and potential impacts in proportion to their significance and impact. Some management strategies, such as educational signage, can be implemented quickly based on current data and visible resource impacts. More complex management strategies, such as visitor use limits will be considered for implementation as resource conditions are monitored and documented.

A level of uncertainty and risk will always be associated with the issues concerning visitor use management. In certain situations, where there is an imminent risk or threat to irreplaceable resources, DRP will rely on professional judgement and the best available data. All decisions regarding visitor use will be addressed with a well-documented analysis and administrative record that supports the decision. Information on monitoring efforts, related visitor-use management actions and any proposed changes to the identified indicators and standards will be shared with the public. Additional detail concerning the visitor use management strategy including a summary table of the proposed Visitor Use Management Indicators, Thresholds and Management Strategies can be found in the Land Use Component and in Appendix 9.

RUTH B. KIRBY GILCHRIST BLUE SPRINGS STATE PARK UNIT MANAGEMENT PLAN EXECUTIVE SUMMARY

MANAGEMENT PLAN GOALS, OBJECTIVES AND ACTIONS

Measurable objectives and actions have been identified for each of the Division's management goals for Ruth B. Kirby Gilchrist Blue 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, a number of annual work plans provide more specific guidance for Division 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 Division 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 Division'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 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.

RUTH B. KIRBY GILCHRIST BLUE SPRINGS STATE PARK UNIT MANAGEMENT PLAN EXECUTIVE SUMMARY

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: Evaluate and mitigate impacts of soil erosion in the park.
- Objective: Conduct/obtain an assessment of the park's hydrological restoration needs.Therefore restoring natural hydrological conditions and functions to approximately 2 acres of spring-run stream natural community.

NATURAL COMMUNITIES MANAGEMENT

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

- Objective: Complete a comprehensive floral and faunal survey and create/update the park's baseline plant and animal list.
- Objective: Within 10 years, have 250 acres of the park maintained within the optimum fire return interval.
- Objective: Conduct natural community/habitat improvement activities on 276 acres of sandhill natural community.

IMPERILED SPECIES MANAGEMENT

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

- Objective: Develop/update baseline imperiled species occurrence inventory lists for plants and animals.
- Objective: Monitor and document 3 selected imperiled animal species in the park.
- Objective: Monitor and document 1 selected imperiled plant species in the park.

RUTH B. KIRBY GILCHRIST BLUE SPRINGS STATE PARK UNIT MANAGEMENT PLAN EXECUTIVE SUMMARY

EXOTIC SPECIES MANAGEMENT

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

- Objective: Annually treat all infested acres of exotic plant species in the park
- Objective: Implement control measures on 1 exotic animal species in the park
- Objective: Monitor and document 1 selected imperiled plant species in the park

CULTURAL RESOURCE MANAGEMENT

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

- Objective: Assess and evaluate the physical condition of 1 cultural site in the park
- Objective: Compile reliable documentation for all recorded historic and archaeological resources
- Objective: Bring 1 of 2 recorded cultural resources into good condition

LAND USE AND RECREATION

Goal: Provide public access and recreational opportunities in the park

- Objective: Provide and develop public access through appropriate resource-based recreational activities.

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

  - Redesign and redevelopment of the main day use area, including a new bathhouse, picnic pavilions and improved parking
  - Hiking trail development
  - New canoe/kayak launch
  - New boardwalk
  - New 40-Site Family Campground (30 traditional campsites, 10 tent-only sites, bathhouse)
  - New park entrance drive and ranger station
  - New support facilities including a shop, staff residence, and wastewater treatment plant

RUTH B. KIRBY GILCHRIST BLUE SPRINGS STATE PARK UNIT MANAGEMENT PLAN EXECUTIVE SUMMARY

ACQUISITION NEEDS/ACREAGE

Approximately acres of land are identified within the optimum boundary for Ruth B. Kirby Gilchrist Blue Springs State Park (see Optimum Boundary Map, page xx). Parcels that lie to the east of the park have been included to enhance protection the Santa Fe River floodplain, two additional named springs, and to provide a greenway connection between Gilchrist Blue Springs and Poe Springs County Park (Alachua County).

Additional parcels along the park's eastern boundary that are under single ownership have also been included. Digital elevation models indicated that the largest of these parcels contains an extensive area of floodplain and potential karst features. These parcels as well as additional property identify to the park's southwest would buffer the park from potential future development and provide enhanced floodplain and springshed protection.

SURPLUS LANDS/ACREAGE

No lands are considered surplus to the needs of the park.

PUBLIC INVOLVEMENT

DRP provided an opportunity for public input by conducting two public workshops and an Advisory Group meeting to present the draft management plan to the public. These meetings were held on October 23 and 24, 2019, respectively. Meeting notices were published in the Florida Administrative Register, DATE, Volume XX, Number XX, 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 Appendix 2).

THIS PAGE INTENTIONALLY LEFT BLANK

Ruth B. Kirby
Gilchrist Blue Springs
State Park

Advisory Group Draft
Unit Management Plan

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL PROTECTION

Division of Recreation and Parks
October 2019

TABLE OF CONTENTS

RESOURCE MANAGEMENT COMPONENT

LAND USE COMPONENT

IMPLEMENTATION COMPONENT

TABLES

MAPS

LIST OF ADDENDA

THIS PAGE INTENTIONALLY LEFT BLANK

INTRODUCTION

Ruth B. Kirby Gilchrist Blue Springs State Park (Gilchrist Blue Springs) is in Gilchrist County about 5 miles to the west of High Springs, FL in the north central part of the state along the Santa Fe River. The park is located 25 miles south of Lake City and about 20 miles to the northwest of Gainesville (see Vicinity Map). Access to the park is from Hwy 236 (CR 340) and NE 80th St. (see Reference Map). The park is in an area well known for the many spectacular freshwater springs that can be found along the Suwanee and Santa Fe Rivers. The significant land and water resources existing near the park are identified on the Vicinity Map.

On June 14, 2017, the Florida Cabinet voted to approve the acquisition of the Blue Springs parcel with funds from the Florida Forever Trust Fund. The park was offcially acquired on October 6, 2017 with funds from the Florida Forever Trust Fund and on October 30, 2017, Ruth B. Kirby Gilchrist Blue Springs State Park officially opened as Florida's 175th state park. Currently, the park comprises 402.42 acres. The Board of Trustees of the Internal Improvement Trust Fund (Trustees) hold fee simple title to the park and on January 3, 2018 the Trustees leased (Lease Number 4814 the property to DRP under a 50-year lease. The current lease will expire on January 2, 2068.

Gilchrist Blue Springs State Park is designated single-use to provide public outdoor recreation and conservation. There are no legislative or executive directives that constrain the use of this property (see Appendix 1). A legal description of the park property can be made available upon request to the Department of Environmental Protection.

Purpose and Significance of the Park

Park Purpose

The purpose of Gilchrist Blue Springs is to protect the water quality of Gilchrist Blue Spring and the park's other known springs; provide for the restoration and preservation of one of Florida's iconic natural spring ecosystems; and to preserve these unique resources for the perpetual enjoyment of future generations.

Park Significance

The park protects a group of significant springs that lay along the Santa Fe River, including two second magnitude springs, Gilchrist Blue Spring and Naked Spring. The Gilchrist Blue Spring run extends nearly one quarter mile in length and is one of the most significant spring runs in the Santa Fe Basin. The Gilchrist Blue Spring run and Naked Spring run were often recognized for their diverse and substantial "underwater forest" of submerged aquatic vegetation. Gilchrist Blue spring is well known for its outstanding water clarity and is renowned for its support of a diversity

of wildlife species including turtles, fish and invertebrates. Gilchrist Blue spring and spring-run provide important habitat for a diversity of freshwater turtle species including the imperiled Suwannee Alligator Snapping Turtle (*Macrochelys suwanniensis*).

The park protects 1.5 miles of the shoreline of the Santa Fe River and supports a diversity of natural plant communities that characterize the Santa Fe River Basin and the region's underlying karst topography. This includes numerous limestone outcrops, sinkholes, and a wide forested floodplain, dominated by large Bald cypress and swamp tupelo trees. The park also contains nearly 200 acres of remnant sandhill identified by large areas of native groundcover including scattered clumps of wiregrass (*Aristida stricta* var. *beyrichiana*) a characteristic sandhill groundcover species.

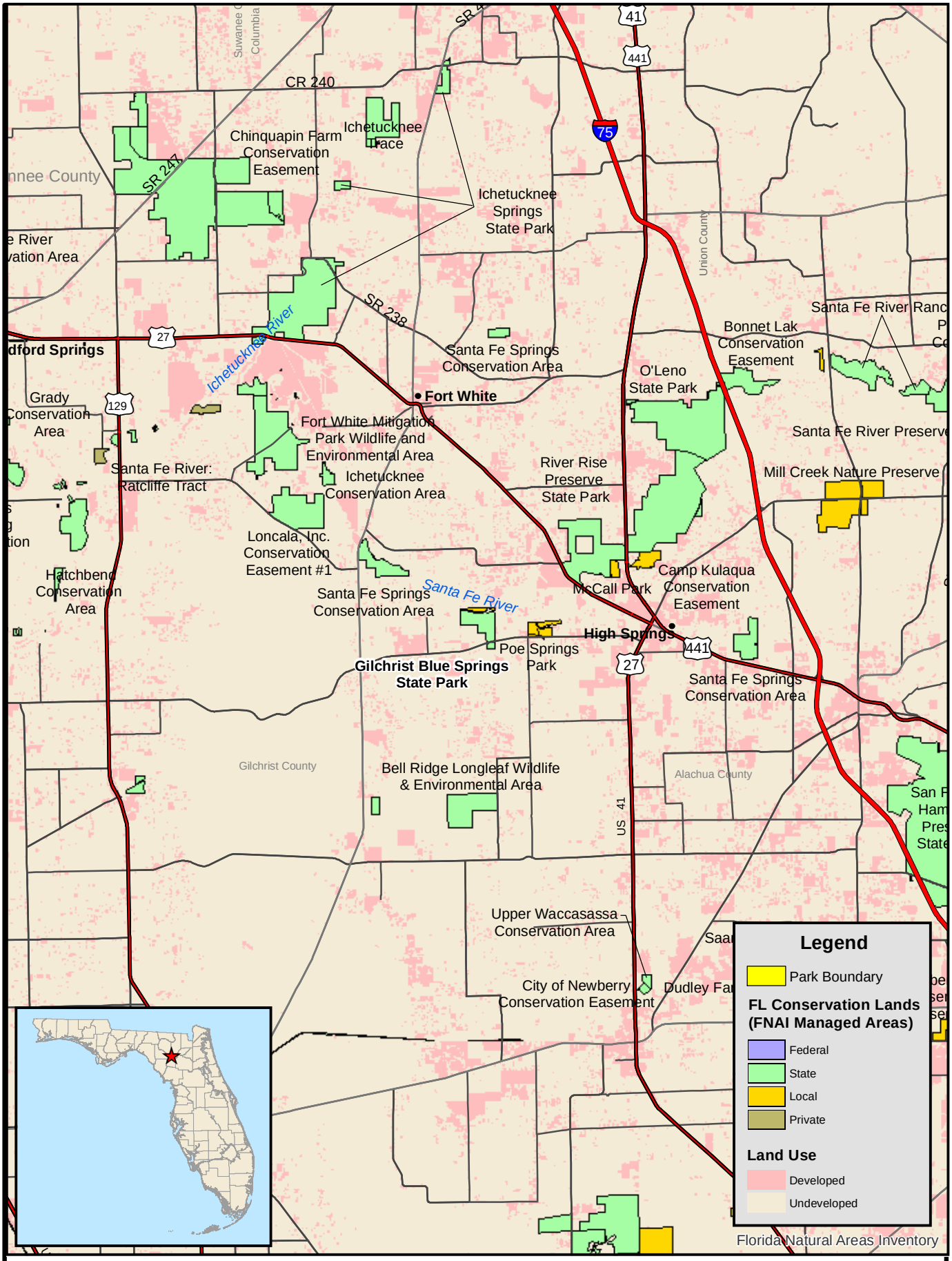
Gilchrist Blue Springs has always been a popular local recreation spot. The late Ed C. Wright, a successful Florida businessman, gifted Gilchrist Blue Spring to Ruth B. Kirby, his longtime personal assistant and companion. Ms. Kirby enjoyed visiting the springs, and in the late 1950's, put in a wooden boardwalk, diving platform, and water access so the public could enjoy the springs as much as she did. She charged a 10-cent admission fee to help maintain the property. In 1971, she convinced her nephew, Harry Barr to move his family to Blue Springs and help her run the park. Ruth Kirby died in 1989 at age 78, and the Barr family continued to provide cautious management of the property's unique and fragile resources for over 40 years.

Today, paddling and swimming in the park's namesake spring and spring-run stream remain popular activities. Park visitors can also enjoy camping, hiking, and picnicking. The park will continue to promote the sustainable use of one of Florida's exceptional spring ecosystems by preserving this quality example of traditional resource-based recreation.

Gilchrist Blue Springs is classified as a State Park in the DRP's unit classification system. In the management of a state park a 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 in the park is directed toward providing public access to and within the park, and to providing recreational facilities, in a reasonable balance, that are both convenient and safe. Program emphasis is on interpretation on 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 Gilchrist Blue 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



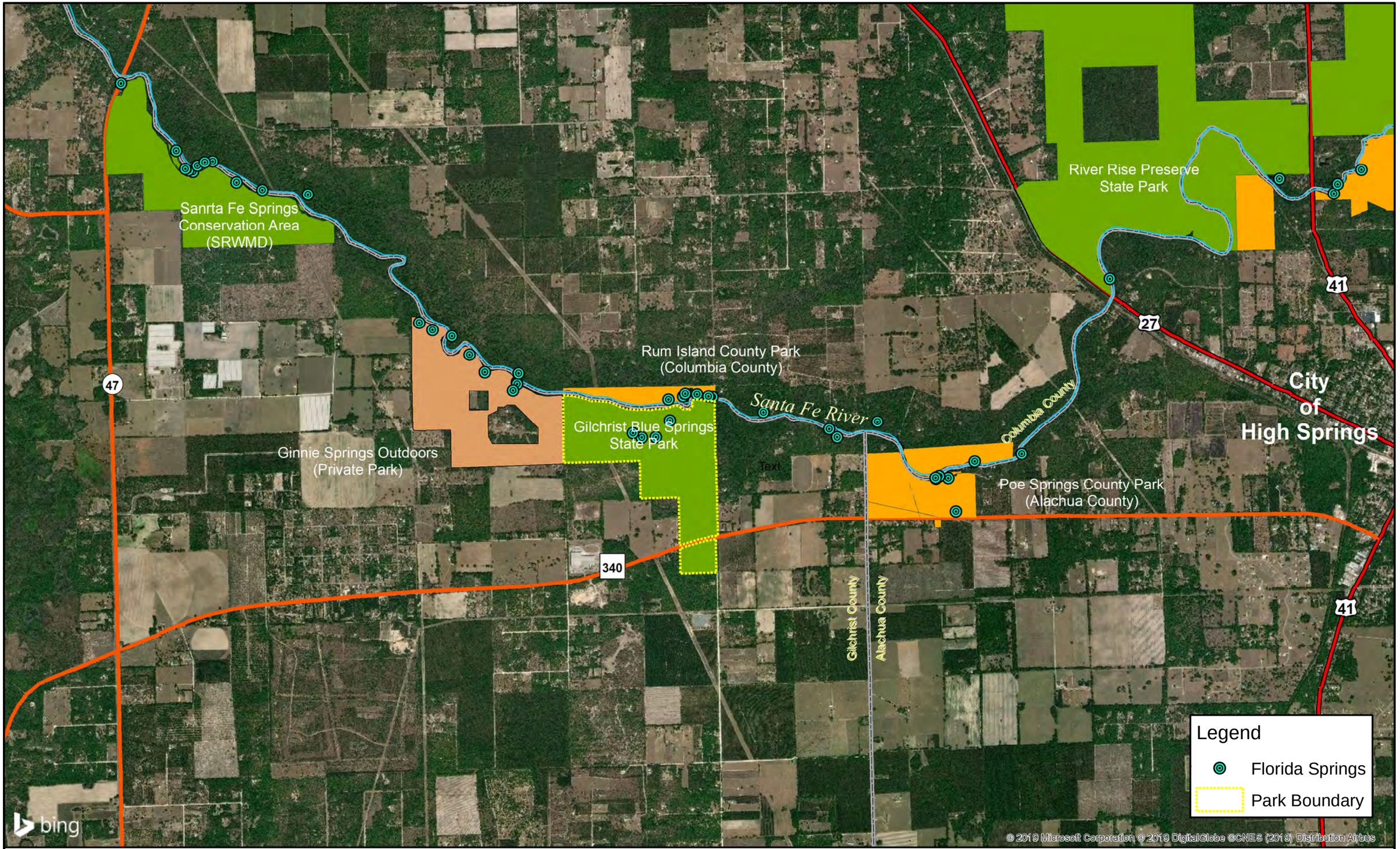
RUTH B. KIRBY
GILCHRIST BLUE SPRINGS
STATE PARK

N

0 1.25 2.5 5 Miles

Florida Department of Environmental Protection
Division of Recreation and Parks

VICINITY MAP



RUTH B. KIRBY
GILCHRIST BLUE SPRINGS STATE PARK

N

0 0.25 0.5 1 Miles

Florida Department of Environmental Protection
Division of Recreation and Parks
Date of aerial; 2019

REFERENCE MAP

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.

The plan consists of three interrelated components: The Resource Management Component, the Land Use Component and the Implementation Component. The Resource Management Component provides a detailed inventory and assessment of the natural and cultural resources of the park. Resource management needs and issues are 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 resource-based recreation and associated facilities and programs to be provided.

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 accordance with 253.034(5) F.S., an analysis of the potential of the park to accommodate secondary management purposes was not conducted as the park is less than 1,000 acres in size.

DRP has determined that 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) would not be consistent with this plan or the management purposes of the park.

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 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. Management activities to be conducted within area covered by this agreement are outlined in the Resource Management Component.

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 Suwannee River Water Management District

(SRWMD) assists staff with monitoring the quality and quantity of the park's water resources and other water resource management activities.

Public Participation

DRP provided an opportunity for public input by conducting a public workshop and an Advisory Group meeting to present the draft management plan to the public. These meetings were held on [INSERT Dates], respectively. Meeting notices were published in the Florida Administrative Register, [INSERT publication date, VOL/ISSUE], 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 Appendix 2).

Other Designations

Gilchrist Blue Springs 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 currently not a component of the Florida Greenways and Trails System, administered by the Department's Office of Greenways and Trails.

The Santa Fe River is designated as an Outstanding Florida Water. 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

The Florida Department of Environmental Protection (DEP), Division of Recreation and Parks (DRP) in accordance with Chapter 258, Florida Statutes, 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. Management measures expressed in this plan are consistent with the DRP's overall mission in natural systems management. Cited references are contained in Appendix 3.

The DRP's 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 seriously compromise the park values.

The DRP's management goal for cultural resources is to preserve historic properties of state and national significance and interpretive value and to interpret the history associated with them. This goal often entails active measures to locate, inventory, and evaluate cultural resources and to preserve, restore, reconstruct, or rehabilitate them for appropriate public use.

Management of the park's natural and cultural resources includes the monitoring and management of resource impacts from recreational activity, to protect the quality of park resources, and the purposes of the park.

Because park units are often components of larger ecosystems, their proper management can be affected by conditions and events that occur beyond park boundaries. In order to effectively maintain the park's natural resources, park staff continually assess resource conditions, evaluate management activities and refine management actions, and review local comprehensive plans and development permit applications for park/ecosystem impacts.

Management Goals, Objectives and Actions

Measurable objectives and actions have been identified for each of the DRP's management goals for Gilchrist Blue Springs. 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.

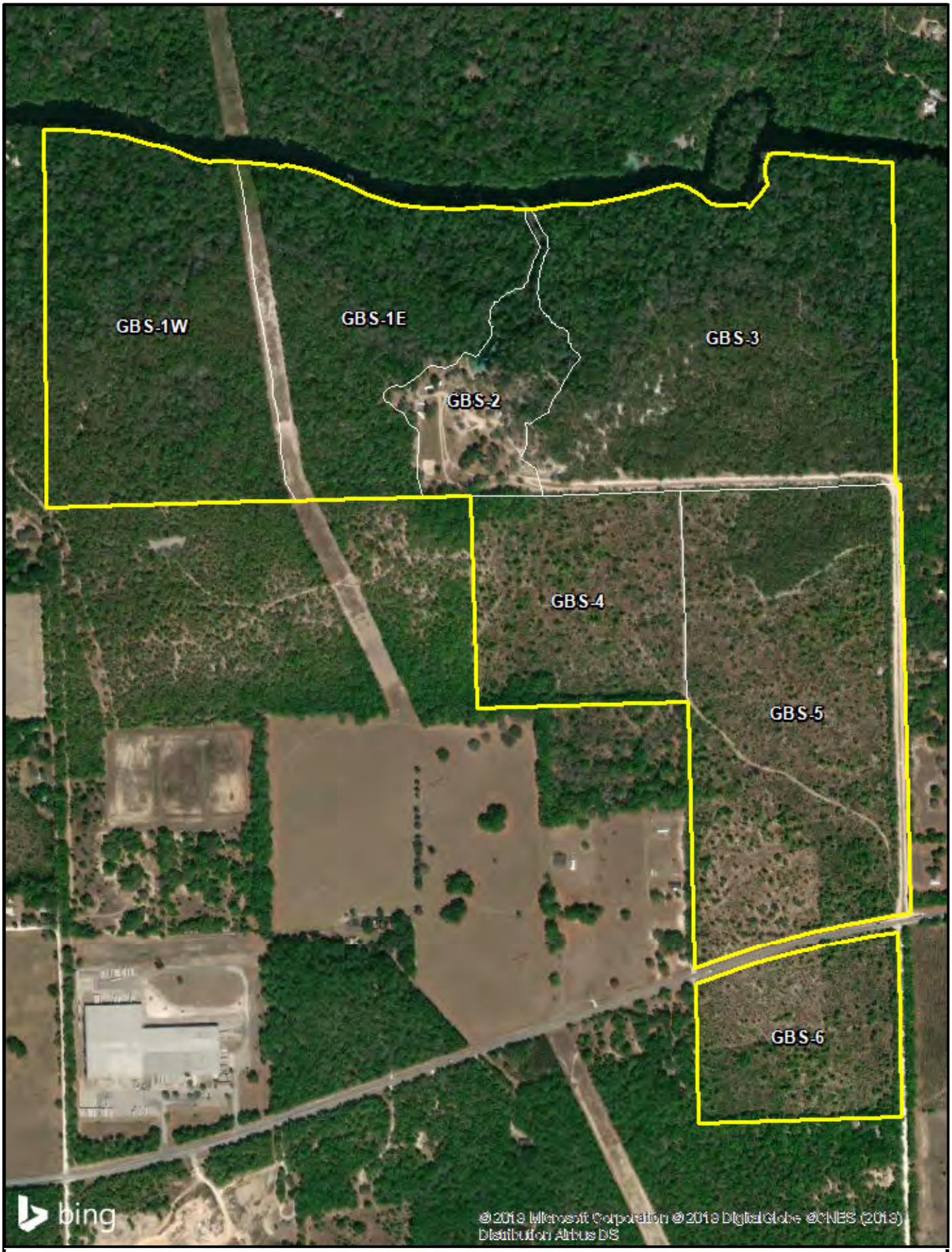
While the DRP utilizes the ten-year management plan to serve as the basic statement of policy and future direction for each park, a number of annual work plans provide more specific guidance for DRP staff to accomplish many of the resource management goals and objectives of the park. Where such detailed 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 long-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 are used to refine techniques, methodologies, and strategies, and ensure that each park's prescribed management actions are monitored and reported as required by Sections 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. The ten-year management plan is based on conditions that exist at the time the plan is developed. The annual work plans 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 and Cultural Resource Management

The entire park is divided into management zones that 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 type, burn zone, 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 include fire-dependent natural communities. Table 1 reflects the management zones with the acres of each zone.



RUTH B. KIRBY
GILCHRIST BLUE SPRINGS
STATE PARK

N

0 300 600 1,200 Feet

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

MANAGEMENT ZONES
MAP

Table 1: Gilchrist Blue Springs State Park Management Zones			
Management Zone	**Acreage**	**Managed with Prescribed Fire**	**Contains Known Cultural Resources**
GBS-1e	56.09	Y	Unknown
GBS-1w	70.58	Y	Unknown
GBS-2	21.01	N	Y
GBS-3	96.07	Y	Y
GBS-4	39.91	Y	Unknown
GBS-5	88.27	Y	Unknown
GBS-6	30.49	Y	Unknown

Soils and Geological Resources

Description and Assessment

Topography

The park is located in the Gulf Coastal Lowlands geomorphologic region, and more specifically in the Suwannee River Lowlands (White 1970). The Gulf Coastal Lowlands are described as gently sloping terraces that originate in the highlands and extend towards the coast. Limestone is typically at or near the surface throughout most of this region, with sand or sandy clay overlying it.

Park elevations range from 20 feet at the north boundary along the Santa Fe River to approximately 75 feet above mean sea level (msl) at the south boundary (see Topographic Map). The property slopes up from the Santa Fe floodplain towards the uplands to the south. The 100-year floodplain (base flood elevation) as calculated by the Suwannee River Water Management District (SRWMD) for the Gilchrist Blue Spring reach of the Santa Fe River is 38.4 feet based on NAVD88.

Some alterations of natural topography have taken place in the park. The most obvious alterations are the large powerline easement bisecting the western side of the park, the park entrance road, parking area, and terraced areas on the slopes above the main spring boil. Limited disturbances are associated with the former old fields and pine plantations in portions of zones GBS-4, GBS-5, and GBS-6. Minor furrowing appears to have occurred in the old fields in the SW area of zone GBS-5 and the NW area of zone GBS-6 prior to pine planting in the 1990s. Native sandhill groundcover persists in the remaining uplands despite pine planting due to the lack of site preparation activities outside the old field areas. There is also a borrow pit located near the powerline in zone GBS-1e, as well as several deep gouges along the powerline where sand has been removed.

Soils

Six soil types (http://websoilsurvey.sc.egov.usda.gov), are found at the park (see Soils Map). For detailed information on soils, see Appendix 4.

The soil surface has undergone significant alterations and there are obvious signs that erosion and sedimentation have impacted several localized areas, including the entire upslope terrace around the Gilchrist Blue main headspring, the boil and spring run of both Gilchrist Blue and Naked springs, the campground, the main entrance road, and along the western powerline easement.

The vegetation on the slopes above the main headspring is nearly absent due to intensive trampling from foot and vehicle traffic, and soil erosion is commonplace. Numerous exposed wooden timbers are imbedded throughout the steep slopes of the spring bowl that appear to have been strategically arranged for soil stabilization, including a large wooden retaining wall around most of the main headspring. Unfortunately, the surface terraces in the main spring bowl are not slowing down stormwater runoff enough to prevent substantial soil erosion and sedimentation. Additionally, exposed roots from many large trees scattered across the main spring bowl, as well as the wooden timbers, can act as tripping hazards.

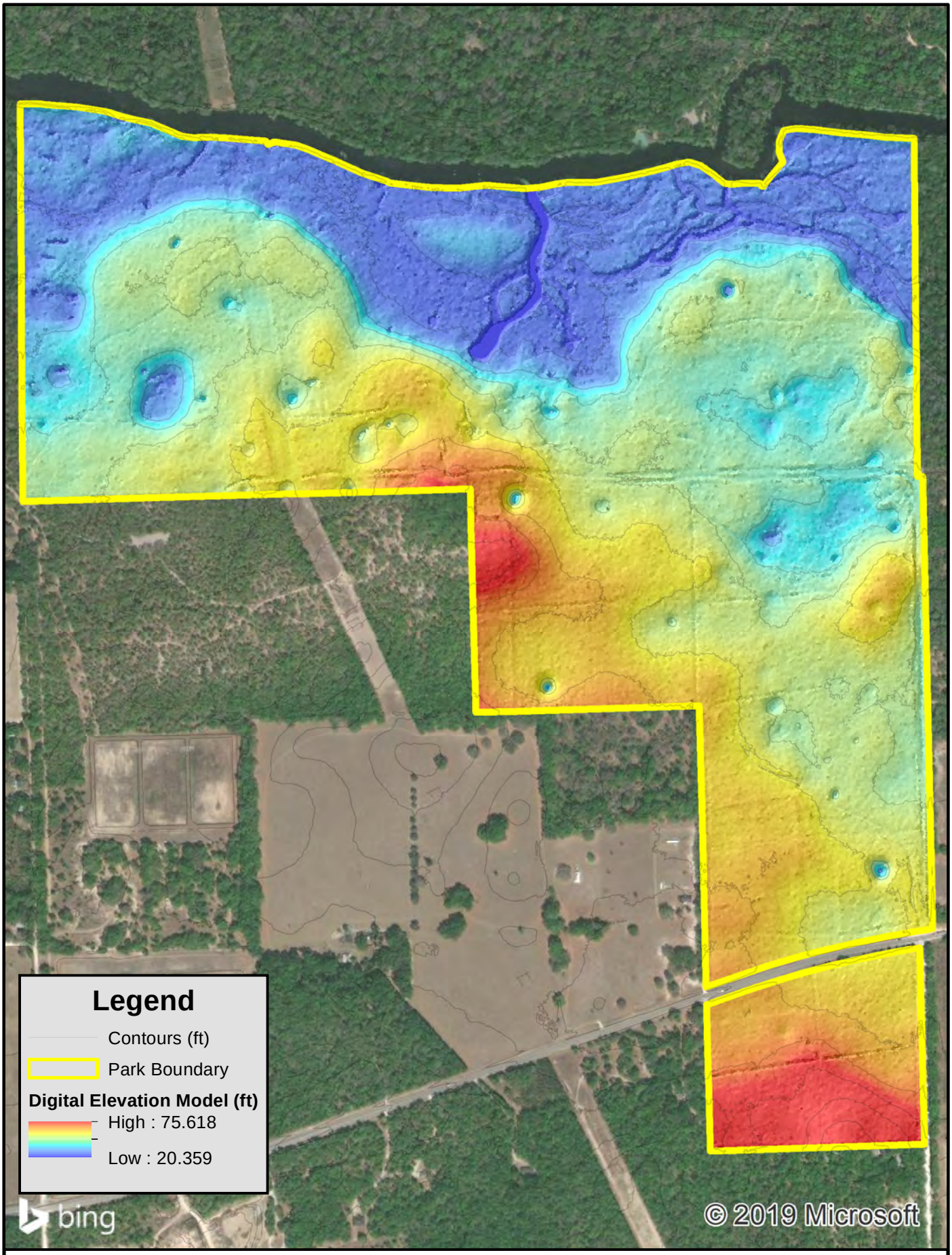
Visual observation of current conditions and a review of historic photos indicates that a significant level of erosion and sedimentation has occurred, over the years, within Gilchrist Blue Spring and Naked Spring and their associated spring run streams.

Evidence of significant erosion can be observed at the bottom of Gilchrist Blue Spring, with significant areas artificially devoid of submerged aquatic vegetation (SAV) and by the presence of a wide, deep, bare soil trench that continues along the center of the entire spring run stream out to the mouth at the Santa Fe River. Recreational pressure from swimming and wading undoubtedly contributes to the erosion and SAV impacts on the spring-run bottom, especially when water levels are low.

Geology

The park is situated in the Gulf Coastal Lowlands, specifically within the Lower Santa Fe River (SRWMD 2013). The Gulf Coastal Lowlands consist of an extensive karst plain characterized by exposed surface limestone, sinkholes, and internally drained swallet wetlands.

Several limestone outcrops are scattered throughout the park. The underlying limestone within this region has undergone extensive solution activity resulting in surface features characteristic of karst topography. Surface features such as sinkholes, springs, and swallet depressions were caused by the collapse of the upper layers of soil and mineral materials into underlying solution voids and caverns.



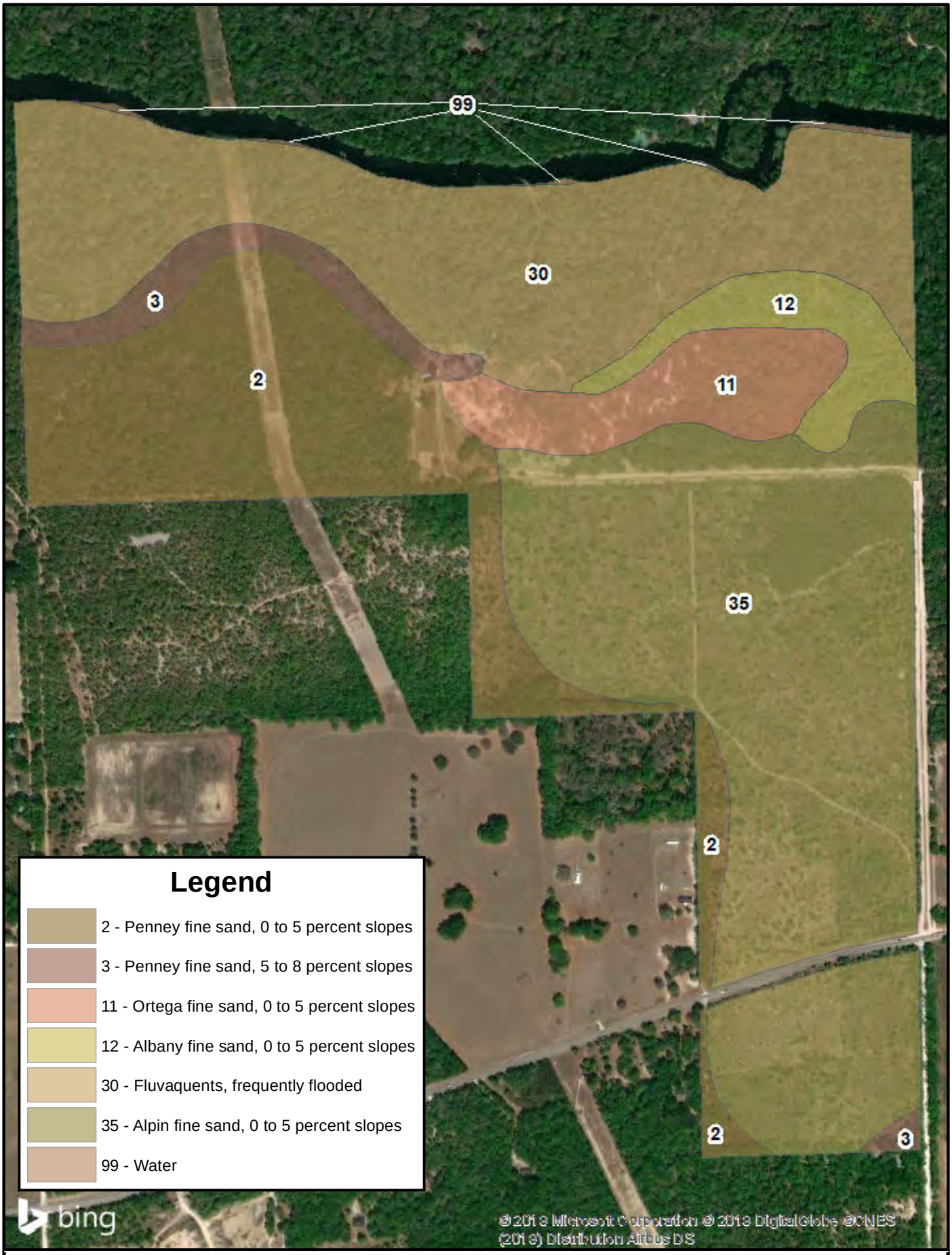
RUTH B. KIRBY
GILCHRIST BLUE SPRINGS
STATE PARK

N

0 250 500 1,000 Feet

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

TOPOGRAPHIC MAP



RUTH B. KIRBY
GILCHRIST BLUE SPRINGS
STATE PARK

N

0 250 500 1,000 Feet

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

SOILS MAP

Other important physiographic landscape features include Bell Ridge, Brooksville Ridge, Waccasassa Flats, and High Springs Gap (Williams et al. 1977; Upchurch et al. 2011). Bell and Brooksville Ridges are Pleistocene-age beach dunes that bisect Gilchrist County from north to south and consist of sandy overburden underlain with clastic Miocene sediments with significantly higher elevations and with very little surface drainage (Puri and Vernon 1964; Col et al. 1997). The Bell Ridge straddles the Waccasassa Flats, both of which are characterized by a perched water table and numerous surface wetlands. The High Springs Gap is a low area between these ridges and the Santa Fe River flows through this valley region.

Mineral Resources

Though no mining activities are known to have occurred in the park, limestone is extracted in the surrounding region for use as road base material. Whether mineral deposits of commercial value exist in the park is unknown.

Water Resources

Description and Assessment

The park's northern boundary is located on the southern bank of the Lower Santa Fe River along the Columbia-Gilchrist County line (Upchurch et al. 2011). Gilchrist Blue Springs is a large, second-magnitude spring group that provides a significant source of groundwater to the adjacent Santa Fe River. The Santa Fe River, Gilchrist Blue Spring Group (including three major springs), and a unique basin swamp are the three most prominent hydrological features in the park.

The Santa Fe River is a 1,384-square mile surface watershed that occupies portions of nine north Florida counties, from Clay County in the east to Gilchrist and Suwannee counties in the west (Clark et al. 1964; Berndt et al. 1996). The overall flow of the Santa Fe is from the east to the west. The Santa Fe is also one of three major tributaries of the Suwannee River, encompassing nearly 14 percent of the entire Suwannee watershed (SRWMD 2006). The Suwannee River is a free-flowing (i.e. unaffected by dams) natural system that drains approximately 10,000 square miles of the Florida/Georgia region and ultimately discharges into the Gulf of Mexico through Florida's largest publicly managed estuary, Big Bend Seagrasses Aquatic Preserve (FDEP 2014).

The Suwannee and Santa Fe Rivers are both designated as Class III Outstanding Florida Water (OFW) which is conferred to waterbodies with "*exceptional recreational or ecological significance*" (Chapter 62-302.700[3], F.A.C.). The average flow of the Santa Fe River contributes approximately 1 billion gallons per day to the Suwannee (Berndt et al. 1996; SRWMD 2013). Average annual rainfall for the Lower Santa Fe region approaches 60 inches a year (Fernald and Purdum 1998).

The Santa Fe River can be divided into an upper and lower reach based on distinctly different geological characteristics within each section (SRWMD 2007). Water

scientists have described the Santa Fe River as one of Florida's most biologically diverse river systems because of its unique position in the ecological landscape.

The Upper Santa Fe River receives major surface water inputs from several significant tributaries such as Olustee Creek. Below the Olustee tributary, the Santa Fe River begins to cross the wide geologic transition known as the Cody Escarpment (White 1970; Upchurch 2002). As with most of the major streams that cross this scarp feature, a sizeable proportion of the river flow disappears underground into swallet openings and reemerges at various resurgence points after mixing with groundwater in the Floridan aquifer (Martin and Dean 2001).

In the Upper Santa Fe, stream flow is highly dependent on surface runoff, but there is some seepage input from the surficial aquifer as well. The surficial aquifer in this region has a well-defined confining unit that separates it from the Floridan aquifer below (Miller 1986). In contrast, groundwater inputs heavily influence river discharge in the Lower Santa Fe Basin (Clark et al. 1964). This region, which includes Gilchrist Blue Springs State Park, is part of an extensive karst plain where the confining units are discontinuous or absent, especially within the western third of the watershed (Williams et al. 1977). In fact, during periods of low surface water flows, discharge from the western portion of this watershed consists almost entirely of groundwater with most of its water supply from springs such as Gilchrist Blue. In other words, the base flow of the Santa Fe is derived principally from the Floridan aquifer (Meyer 1962; Meyer et al. 2008).

The Suwannee River Water Management District (SRWMD) and FDEP adopted a minimum flow and level (MFL) for the Upper Santa Fe River in 2007 and for the Lower Santa Fe in 2013 (SRWMD 2007; SRWMD 2013). Florida's Water Resource Act of 1972 requires Water Management Districts to establish MFLs to ensure that water bodies do not experience significant harm. If a waterbody is expected to fall below an MFL during a 20-year planning period, an MFL prevention and/or recovery strategy must be expeditiously developed (Subsection 373.0421(2), F.S.). In 2014, SRWMD and FDEP developed an MFL recovery strategy for the Lower Santa Fe and Ichetucknee River because the current flows as compared to historic flows in both systems were undergoing unacceptable impacts due to regional groundwater withdrawals (Grubbs and Crandall 2007; Williams et al. 2011; SRWMD 2014). As of 2019, Gilchrist Blue Spring did not have a separate MFL, but SRWMD has scheduled this spring for assessment beginning in 2020. Spring flows from Gilchrist Blue have steadily declined since they were first recorded in the early 1970s (Johnston et al. 2016).

Gilchrist Springshed and its Major Springs

Gilchrist Blue and Naked Spring are two significant second-magnitude springs. The park also contains an abundance of smaller springs and seepages scattered across the property (Rosenau et al. 1977; Scott et al. 2004). Gilchrist Blue Spring is the largest spring in the park and within its main headspring are several linear vents that discharge groundwater from beneath the base of a submerged limestone ledge. The Gilchrist Blue Spring-run stream, which heads briefly northeast before

turning northward to the Santa Fe River, is approximately 1,200 feet long, 20-60 feet wide, and one to six feet deep.

As the Gilchrist Blue spring-run stream flows northward through a forested floodplain canopy to the Santa Fe, two additional spring tributaries merge with the main spring-run; Little Blue Spring (a fourth-magnitude spring) enters from the west about 100 feet downstream from the main spring pool, and Naked Spring enters from the east about 500 feet downstream (Hornsby and Ceryak 1998). Naked Spring spring-run is over 400 feet long, 10-15 feet wide and 1-3 feet deep. The spring-run of Little Blue is much shallower and not as clearly defined as the larger spring-run of Naked Spring.

The discharge of Gilchrist Blue Spring (combined with Naked Spring and Little Blue Spring at the mouth) was first measured in April 1975 with a flow of 42 cubic feet per second (cfs). The average recorded flow for Gilchrist Blue Spring is 45.16 cfs (N= 106), with a minimum 8.43 cfs (April 26, 2012) and maximum 89.4 cfs (October 21, 2015).

Another prominent karst feature on the property with direct discharge into the Santa Fe River is Johnson Spring, currently classified as a third-magnitude vent (historic second-magnitude). There is also a unique basin swamp with scattered limestone outcrops situated west of the main spring in zone GBS-1w.

Hydrologic models have identified as many as ten distinct springshed boundaries within the Santa Fe Basin, with the three largest spring groups by area being Ichetucknee, Gilchrist Blue-Rum Island, and Hornsby-Treehouse (Kincaid 2011; Upchurch and Champion 2004; Upchurch et al. 2011). The Gilchrist Blue-Rum Island springshed is a sub-basin of the Lower Santa Fe River, which ultimately flows into the Suwannee River. The Ginnie springshed lies immediately west of Gilchrist Blue Spring and to its east is the Poe springshed. Gilchrist Blue-Rum Island, Ginnie, and Poe springsheds are all complex cavern-dominated, and partially interrelated systems that should be treated as one until additional research can better delineate their boundaries (Upchurch et al. 2011).

Delineation of the Lower Santa Fe River springsheds, including Gilchrist Blue, began in the mid-1990s with dye trace studies that were conducted within the adjacent Ginnie springshed and more recently by groundwater modeling analyses (Kincaid 1998; Meyer et al. 2008; Upchurch et al. 2011). It is important to realize that determining the exact size of a groundwater basin is complicated because of the unconfined geology of the Lower Santa Fe region. At its greatest distance from north to south, the Gilchrist Blue springshed measures nearly 30 miles, and its surface and groundwater basins encompass more than 420 square miles. There has been very little aquatic cave system exploration conducted at Gilchrist Blue Springs. One portion of the Ginnie Springs cave system (Devils Ear) lies beneath the western park boundary.

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 spring-run streams at the park, back flooding occurs periodically when hydrologic conditions in the Suwannee River cause a reduction in outflow from 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 Gilchrist Blue spring-run to flow into the Santa Fe occurs at the confluence of the two tributaries. The full flow of the Gilchrist Blue spring-run is unable to penetrate the Santa Fe, and back flooding of the spring-run streams at the park is the result.

At least four of the park's natural communities significantly benefit from this phenomenon of ephemeral back flooding: alluvial forest, floodplain swamp, basin swamp, and bottomland forest. 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 could ensue. Alteration of the back-flooding regime on the Santa Fe 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).

River stage has been recorded on the Suwannee River since 1906, and it is important to understand that this 100-year plus record has provided water scientists with a unique dataset that can be used to determine historic flows and flood events (Verdi and Tomlinson 2009). During that period, water scientists have closely documented every major flood and drought that has affected the Suwannee River. From 1942 to 2019, 15 significant floods and 9 major droughts were recorded in north peninsular Florida (Verdi et al. 2006; Verdi and Tomlinson 2009). Three of the most extreme droughts in the Suwannee River Basin during this period occurred in 1954-1956, 1998-2002, and 2010-2012 (SRWMD 2018; Verdi et al. 2006). Numerous gauges at unique locations along the Suwannee and Santa Fe rivers track not only river stage but discharge as well (USGS 2018; Verdi et al. 2006).

When the Suwannee (and therefore the Santa Fe River) floods, the high river stage affects spring-run tributaries (e.g., Gilchrist Blue) along its reaches, gradually "pushing back" against the head pressure in the Floridan aquifer that causes springs to flow. As the Santa Fe back-floods into the Gilchrist Blue Spring run when river flooding occurs, river and spring waters begin to mix (Katz et al. 1999). The extent of mixing, as determined by monitoring of water clarity in springs, can be a helpful tool in documenting changes in groundwater discharge in spring systems (Anastasiou 2006). Marked changes in water clarity can be observed within the Gilchrist Blue Spring run depending on factors such as discharge, clarity of the Santa Fe River, and height of river stage. Partial or complete brownouts of the Gilchrist Blue spring system may result. A complete brownout is considered to have occurred when tannic river water covers the entire spring-run and head spring, with water clarity reduced to less than four feet of visibility. If the surface water

pressure exceeds the groundwater head pressure, the springs at the park may even reverse flow and function as “siphons”, or inflow points into the Upper Floridan aquifer (Gulley et al. 2011). In that respect, Gilchrist Blue Springs can act as an estavelle, a type of spring whose fluctuations in discharge reflect a direct relationship between groundwater potential and river stage (Copeland 2003).

Another prominent ecosystem process occurring in the Gilchrist Blue springshed is the movement of contaminants and nutrients through surface and ground waters within the basin (Katz and Hornsby 1998; Heffernan et al. 2010). Deterioration of groundwater quality in the Gilchrist Blue springshed will ultimately threaten water resources within the park itself. There are numerous non-point sources of groundwater pollution in the region outside the park (Obreza and Means 2006).

Gilchrist County ranks among the top five largest counties in the Lower Santa Fe River Basin with the predominant land use being devoted to agriculture (Obreza and Means 2006). Levy County and Gilchrist County, both ranked among the highest in the state in silage corn production, use more than 5,700 tons of nitrogen fertilizer per year combined. As a result, nitrate levels in the Floridan aquifer in north Florida have increased by an order of magnitude or more over the past 50 years (Cohen et al. 2007; Upchurch et al. 2007). Human activity, especially the use of inorganic fertilizer, has long been the leading cause of this enrichment.

Water quality measurements have been collected sporadically at Gilchrist Blue Springs since 2001 (SRWMD 2018; FDEP 2018). During the period from 2001-2017 (N= 34), the average nitrate-nitrite level is nearly 2.2 mg/L, placing Gilchrist Blue in the top 5 Florida springs with the poorest water quality based on that parameter. Naturally occurring background levels for nitrates in groundwater, for example, should be less than 0.01 mg/L (Cohen et al. 2007). There have also been trace amounts of at least three toxic chemical substances detected within water samples at Gilchrist Blue, including arsenic, atrazine, and chromium (FDEP 2018).

Hydrologists have also 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 benthic macroalgae (periphyton) growth in marine and freshwater ecosystems (Stevenson et al. 2007; Lapointe et al. 2019). These pollutants play a key role in waterbody eutrophication and subsequent widespread macroalgae blooms. Excessive nitrogen, specifically in its nitrate form (NO_3), 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 (NO_3) 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). 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 and 11 thousand tons of phosphorus (District 2 DRP files).

In most of Florida's springs, including Gilchrist Blue, increased nitrogen and phosphorus levels are now recognized as a significant driving force behind large-scale nuisance aquatic macroalgae blooms (Stevenson et al. 2007; Heffernan et al. 2010). The algae growth in many Florida springs is now so rampant that submerged plants are being smothered by periphyton, and in fact, large-scale die-offs of submerged aquatic vegetation (SAV) have occurred (District 2 DRP files; Wetland Solutions Inc. 2010). Water scientists suggest that eutrophication, spring velocity (Reaver et al. 2019; King 2014) and fluctuations in invertebrate grazer biomass (Liebowitz et al. 2014) all play important roles in influencing the spread of nuisance algae in spring ecosystems (Heffernan et al. 2010).

The historical narrative and photographic records of Gilchrist Blue and Naked springs illustrate that up through March 2017 there was a high diversity (at least 11 species) of native SAV covering a significant area of these two spring-run streams (Johnston et al. 2016; Johnston et al. 2018; Morris et al. 2017; Alder et al. 2018). Historically, Gilchrist and the other inland freshwater Florida spring ecosystems have been characterized by thick beds of five dominant submerged aquatic plants, including spring-tape (*Sagittaria kurtziana*), southern waternymph (*Najas guadalupensis*), eelgrass (*Vallisneria americana*), creeping primrosewillow (*Ludwigia repens*), and muskgrass (*Chara* sp.) (Whitford 1956). The presence of these five dominant SAV taxa have long characterized a healthy "underwater forest" within Florida's spring ecosystems (Odum 1957; Wetland Solutions Incorporated 2010; Heffernan et al. 2010).

One of the earliest known assessments of the condition and SAV health of Gilchrist Spring was completed by University of Florida researchers in 2008 (Dina Leibowitz, personal communication). During that work, researchers characterized the SAV as healthy with a high diversity relative to other springs in the Santa Fe River. The non-native hydrilla (*Hydrilla verticillata*) was also unfortunately present in portions of the spring system.

In March 2017, researchers from Alachua County Environmental Protection Department (Alachua EPD) and Karst Environmental Services (KES) set up systematic SAV monitoring transects to quantify aquatic plant bed abundance throughout Gilchrist Blue Spring, Naked Spring, and their associated spring-run streams (Morris et al. 2017). During that work, five of the eleven most dominant native SAV taxa that were documented in Gilchrist spring-run included spring-tape, creeping primrosewillow, southern waternymph, muskgrass and eelgrass. Additionally, two non-native SAV species were documented in Gilchrist, namely hydrilla and Indian swampweed (*Hygrophila polysperma*), the former having been recorded as an extremely dense biomass, especially in the upper section of Gilchrist spring-run (District 2 DRP files). Although SAV diversity of Naked spring-run was slightly lower than Gilchrist during the March 2017 study, five-dominant native SAV taxa were documented including southern waternymph, creeping primrosewillow, spring-tape, water pennywort (*Hydrocotle*), and eelgrass. Also similar to Gilchrist spring-run, non-native hydrilla was extremely dense in some portions of Naked spring-run. One noteworthy mention from the March 2017 SAV work was the observation of a vegetation-free central channel within both Gilchrist and Naked spring-run that was attributed to recreational impacts "as visitors walk up and down the center of the [shallow] spring-run" (Morris et al. 2017).

Following this March 2017 SAV work, Alachua EPD/Karst repeated these annual SAV transect assessments at Gilchrist during 2018 and 2019. Additionally, District 2 biological staff have conducted annual visual and video assessments of SAV throughout Gilchrist and Naked springs from 2017-2019. Except for muskgrass, all previously dominant native SAV taxa have declined significantly within both Gilchrist and Naked spring-run streams (Morris et al. 2018; District 2 DRP files). At this time, it is unknown as to the exact cause of the SAV decline, however both natural and anthropogenic (including recreational) influences are suspected.

Recreational pressures on the SAV in the Gilchrist Blue system are discussed further in the Soils section above, below under spring-run stream natural community, and in the Land Use Component. Two other events after March 2017 may have contributed to severe declines of the SAV. These include a significant herbivory event from a large aggregation of freshwater turtles and a sustained spring brownout associated with high water levels on the Santa Fe River from Hurricane Irma (SRWMD 2018).

The negative effects of large-scale wildlife herbivory events is not an especially novel idea and has been documented by numerous studies in spring ecosystems, including within Gilchrist Blue (Hauxwell et al. 2004; Johnston et al. 2018; Alder et al. 2018). Large turtle aggregations and associated herbivory events have occurred at Gilchrist Blue Springs on at least three separate occasions since 2012 (Johnston et al. 2018). The most recent large-scale herbivory event from turtles at Gilchrist occurred after the March 2017 SAV study (District 2 DRP files).

Some researchers have suspected that over the past several years, a sustained-level of river flooding (ecosystem brownout) throughout the Lower Santa Fe River Basin has contributed to significant declines in “river” SAV due to reduced sunlight, an essential requirement for SAV growth (Canfield and Hoyer 1988; Johnston et al. 2018). Since several of the Santa Fe River springs remained mostly clear during this extended period of Santa Fe brownout, their aquatic plant beds remained essentially intact, especially at Gilchrist Blue and Ichetucknee spring-run streams (Johnston et al. 2018). In recent years, significant increases in the number of freshwater turtles have been documented in both spring ecosystems (District 2 DRP files). As a result, large turtle aggregations that have amassed into Gilchrist and Naked spring-run streams have completely grazed down a majority of the SAV above the root stock (Johnston et al. 2018; District 2 DRP files). This loss of above ground biomass coincided with an observed widening of the central foot path within the spring run, which may have contributed to the loss of a majority of the SAV root systems. Prior to 2018, Ichetucknee and Gilchrist remained the two healthiest spring-run ecosystems in Lower Santa Fe River in terms of intact aquatic plant beds (Kurtz et al. 2004; Morris et al. 2017; Morris et al. 2018).

In Florida, prolonged spring ecosystem brownouts (i.e. a decrease in water clarity) may be occurring at a much-increased frequency due to increased groundwater withdrawals (Knight 2015; Hensley and Cohen 2017). With this combination of herbivory, decreased water clarity, foot traffic, as well as other unknown factors, there appears to have been an ecological tipping-point at Gilchrist Blue, whereby SAV recovery since 2017 has not been able to occur. Since the 2017 mapping, there has been an overall increase in nuisance aquatic algae and no substantial positive changes to the SAV component in the springs and the spring-run streams of Gilchrist Blue and Naked (Morris et al. 2017; Morris et al. 2018).

Unfortunately, elevated groundwater nutrients have contributed to significant declines in the ecological health of spring systems across Florida (Jones et al. 1996; Munch et al. 2006; Cohen et al. 2007; Stevenson et al. 2007; Wetland Solutions

Inc. 2010; Harrington et al. 2010). Studies suggest that the visible presence of nuisance algal biomass in a spring ecosystem is an indicator of an imbalanced distribution of aquatic flora (Rule 62-302.500 (48) (b) F.A.C.). The United States Environmental Protection Agency (EPA) states that water bodies with periphyton levels exceeding 150 mg/m^2 may be biologically impaired and may experience a decline in ecosystem health. It is important to remember that benthic algae have historically been considered a vital natural component of spring ecosystems, however current nuisance levels can be attributed to a system imbalance (Whitford 1956). There is now widespread recognition that periphyton levels, in response to nutrient enrichment, are increasing in nearly all of Florida's springs, and that this is a symptom of the declining ecological health of springs (Kolasa and Pickett 1992; Hornsby et al. 2000; Stevenson et al. 2007; Brown et al. 2008; Copeland et al. 2011; Knight and Clarke 2016).

Groundwater within the Gilchrist Blue springshed moves through a complex matrix of disjointed, and sometimes linked, underground conduits that may return the water to the surface through spring vents. Exploration of major conduits by cave divers can help us gain knowledge about the workings of the underground conduit matrix. Unfortunately, there are no records of aquatic cave exploration for Gilchrist Blue Springs. Given the absence of data from cave exploration, a better understanding of the nature of the conduit connections within the Gilchrist Blue springshed will require additional research, particularly dye trace studies.

Dye trace research is an important tool in establishing the locations of definitive groundwater connections between surface water bodies (Aley 1999; Skiles et al. 1991). Dye tracing was conducted in the adjacent Ginnie Springshed in the late 1990s, but no similar work has been done in the Gilchrist Blue springshed. Several past dye trace studies in the lower Santa Fe region have revealed a direct link between surface/groundwater connectivity and rapid transport of surface runoff through karst features to exit points at springs (Hisert 1994; Hirth 1995; Karst Environmental Services 1997; Kincaid 1998; Butt and Murphy 2003; Champion and Upchurch 2003; Butt 2005; Butt et al. 2006). The studies have also provided scientists with a better understanding of how surface contaminants can move through the Floridan aquifer (Macesich 1988; Martin and Gordon 2000).

Resource Management Activities

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 was impaired prior to acquisition to one degree or another. Florida's ecosystems are 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. Hydrological restoration 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.

Objective A: Evaluate and mitigate impacts of soil erosion in the park.

Action 1 Investigate best management options for additional erosion mitigation in public access areas.
Action 2 Monitor areas prone to erosion.
Action 3 Implement corrective measures where needed to reduce impacts of soil erosion on water resources (e.g., around all springs).

Several areas in the park continue to have erosion issues despite past corrective measures. Mitigation of erosion and sedimentation sites, especially concerning spring and karst features in the park, is a top priority. Staff will investigate best management options for additional mitigation of erosion in public access areas such as the slopes above Gilchrist Blue, Little Blue, Naked, and Johnson springs. Staff will also regularly monitor areas of the park that are prone to erosion. Additional water bars may need to be installed in problem areas to minimize erosion during strong storm events by diverting storm water into surrounding woodlands and encouraging natural infiltration. Wherever necessary, the park will adopt corrective measures to reduce the impacts of soil erosion on water resources. This may include the closure of sensitive areas to public access when necessary to perform restoration activities and promote soil recovery.

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

Action 1 Continue to cooperate with other agencies and independent researchers regarding hydrological research and monitoring programs.
Action 2 Continue monitoring of surface and ground water quality at Gilchrist Blue Springs and track changes.
Action 3 Perform dye trace studies within the Gilchrist Blue springshed to determine the groundwater sources for the spring and karst systems in the park.
Action 4 Continue to monitor land use or zoning changes around the Park.
Action 5 Continue to cooperate with the SRWMD to ensure MFLs for the Santa Fe River are monitored for compliance to maintain historic river flows.

Over the past 50 years, multiple factors have combined to cause a rapid decline in the ecological health of most of Florida's spring ecosystems, which have all experienced dramatic increases in nuisance benthic macroalgae. Increased nutrient loading into the Floridan aquifer, especially within a springshed has long been recognized as a contributing problem. During the period of record for Gilchrist Blue Spring, its nitrate levels have ranked among the highest of all springs in Florida. The mitigation of erosion and sedimentation sites in the park, restoration of

Gilchrist Blue Spring, and protection of the Gilchrist Blue springshed should remain top priorities for the Division.

The DRP will continue its tradition of close cooperation with state and federal agencies and independent researchers engaged in hydrological research and monitoring in the park and on the Santa Fe River, and it will encourage and facilitate additional research in those areas. The DRP will rely upon agencies such as the SRWMD, USGS, and FDEP to keep it apprised of any declines in surface water quality or any suspected contamination of groundwater in the region.

DRP staff will continue to monitor Environmental Resource Permit/Water Use Permit requests for the region and will provide timely and constructive comments as needed to promote protection of the park's water resources. Additional cooperative efforts may include facilitating the review and approval of research permits and providing researchers with assistance in the field, including orientation to park resources. Recommendations derived from these monitoring and research activities will inform the resource management activities at the park.

Even though the Gilchrist Blue springshed has been partially delineated, significant gaps remain in our understanding of the proximal sources of groundwater flow to the park's springs. For water managers to be able to protect water quality and potentially restore spring flows to historic levels, they will need to know the full extent of the springshed. To that end, the DRP will seek funding for dye trace studies that will more completely delineate groundwater sources for the park's springs. Previous dye trace studies in the region have provided the DRP with invaluable information about the various groundwater sources of the springs and the timing of surface water/groundwater interactions that potentially affect water quality.

DRP staff will continue to monitor land use or zoning changes within lands bordering the park. Major ground disturbances on neighboring properties or inadequate treatment of runoff into local streams or karst features could ultimately cause significant degradation of park resources. When appropriate, DRP District 2 staff will provide comments to other agencies regarding proposed changes in land use or zoning that may affect the park. In addition, District 2 staff will closely monitor mining permits and large consumptive use permits in the Gilchrist Blue springshed for significant changes that may adversely affect park resources. The DRP will also continue to work closely with the SRWMD to ensure that the MFL developed for the Santa Fe River, including Gilchrist Blue Spring, is carefully monitored and that historic river flows are protected, or restored, if there is noncompliance with the MFL.

Objective C: Restore natural hydrological conditions and functions to approximately 2 acres of spring-run stream natural community.

Action 1 Close Naked Spring and the lower Gilchrist Blue spring-run stream and other sensitive features in the park to swimming and wading activity to allow SAV restoration. Limit swimming

and wading to the currently designated swimming area within the Gilchrist Blue main headspring.

Action 2 Develop and implement a plan to re-establish littoral and shoreline vegetation adjacent to the swimming area and establish designated water entry points in the swimming area.

Action 3 Develop a plan to conduct experimental SAV plantings within Gilchrist and Naked spring-run streams.

Action 4 Develop and implement monitoring protocols for semi-annual SAV assessments and continuous monitoring in Gilchrist and Naked springs and their associated spring-run streams.

Action 5 Develop and implement a monitoring protocol to track brownouts, turbidity and changes in water clarity of Gilchrist Blue, Little Blue, Johnson, and Naked Springs.

Restoration of the aquatic plant beds adjacent to and downstream of the park's designated swimming area will be a high priority. These areas will also be monitored for negative impacts that might hamper successful restoration of the spring-run stream natural community. Removal of foot traffic from Naked Spring and the lower Gilchrist Blue spring-run will be necessary to allow recovery of the SAV. Staff will examine the feasibility of conducting experimental plantings of key species of native SAV at sites of significant damage. Re-establishment of littoral and shoreline vegetation adjacent to the swimming area will be a priority to reduce erosion around the main spring. Designated water entry points will also help reduce erosion. Experimental plantings will be required if the natural expansion of plants does not occur following closure.

Park and District staff will collaborate with the FWC's Wildlife and Invasive Plant Management bureau to understand the best management practices for controlling hydrilla in the park's springs. Hydrilla will be removed from the spring-run as necessary.

District and park staff will design and implement a monitoring plan to track changes in the SAV health of the Gilchrist and Naked springs and spring-run streams. If data indicate that the natural resources of the spring or karst features are becoming significantly degraded, additional recreational use limits may need to be implemented to protect them from further damage.

The monitoring plan implemented will be semi-annual assessments to document SAV diversity and coverage within Gilchrist and Naked springs including SAV characterization along a known transect, spatial mapping of major aquatic plant beds and continuous monitoring by on-site staff for notable changes. Additional details of the semi-annual assessments are located below in the natural community section under spring-run stream.

It is important that DRP initiate an aggressive monitoring protocol to track all significant changes in aquatic plant beds, especially SAV diversity and brownouts within the park's major spring systems as part of documenting the ecological responses to recreational use, decreased spring discharge, or Santa Fe River

flooding as described above under the hydrology section and below in the natural community section under spring-run stream.

In addition to the continuous monitoring by park staff, DRP will work with SRWMD to understand daily turbidity fluctuations of Gilchrist Blue Spring, especially any impacts that might be associated with recreational use. DRP will work with all stakeholders involved with water quality monitoring including FDEP, SRWMD and other water scientists.

Natural Communities

Description and Assessment

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. Some physical influences, such as fire frequency, may vary from FNAI's descriptions for certain natural communities in this plan.

The park contains 12 distinct natural communities as well as 5 altered landcover types (see Natural Communities Map). A list of known plants and animals occurring in the park is contained in Appendix 5.

Limestone Outcrop

Description and Assessment: The park contains numerous limestone exposures. These occur as limestone outcrops situated along the sides of sinkholes and as large limestone boulders scattered within certain areas of hardwood and bottomland forest. A large outcrop is located near the eastern park boundary.

Desired Future Condition: Limestone outcrops are associated with karst topography and are often found within other features such as sinkholes, or as isolated features within mesic hammocks and upland hardwood forests. Various ferns, bryophytes, mosses, and smaller herbs typically grow on the limestone surface or in crevices. Characteristic species in north Florida will include partridgeberry (*Mitchella repens*), brittle maidenhair fern (*Adiantum tenerum*), netted chain fern (*Woodwardia areolata*), jack-in-the-pulpit (*Arisaema triphyllum*), southern shield fern (*Thelypteris kunthii*), and various species of panicgrass (*Panicum* spp.). Other rare fern species may also occur on limestone outcrops.

General Management Measures: Limestone outcrops must be protected from disturbance, especially from erosion caused by foot traffic. The park should take measures to prevent runoff and erosion from degrading the limestone outcrops, particularly near existing trails or roadways. Personnel involved in the control of exotic plants in sinkholes and upland hardwood or bottomland forests should consider it likely that limestone outcrops or boulders harboring rare plants are

nearby and should minimize ground disturbance and overspray of herbicide as much as possible. Mapping of significant limestone outcrops, accompanied by surveys for imperiled plant species, will be necessary to ensure their long-term protection.

Sandhill

Description and Assessment: The sandhill community occurs on the higher elevations in the park on the deepest and most well-drained soils. Like much of the surrounding region, the sandhills were cleared of the original longleaf pines during the early 1900s or before. Natural regeneration of longleaf pines occurred to varying degrees in the landscape. Scattered mature longleaf are found within the sandhill in zones GBS-1e, GBS-1W, and GBS-3. The sandhills of zones GBS-4, GBS-5, and GBS-6 were cleared of pines prior to the planting of a pine plantation prior to 1993. The plantation was harvested in 2008-2009.

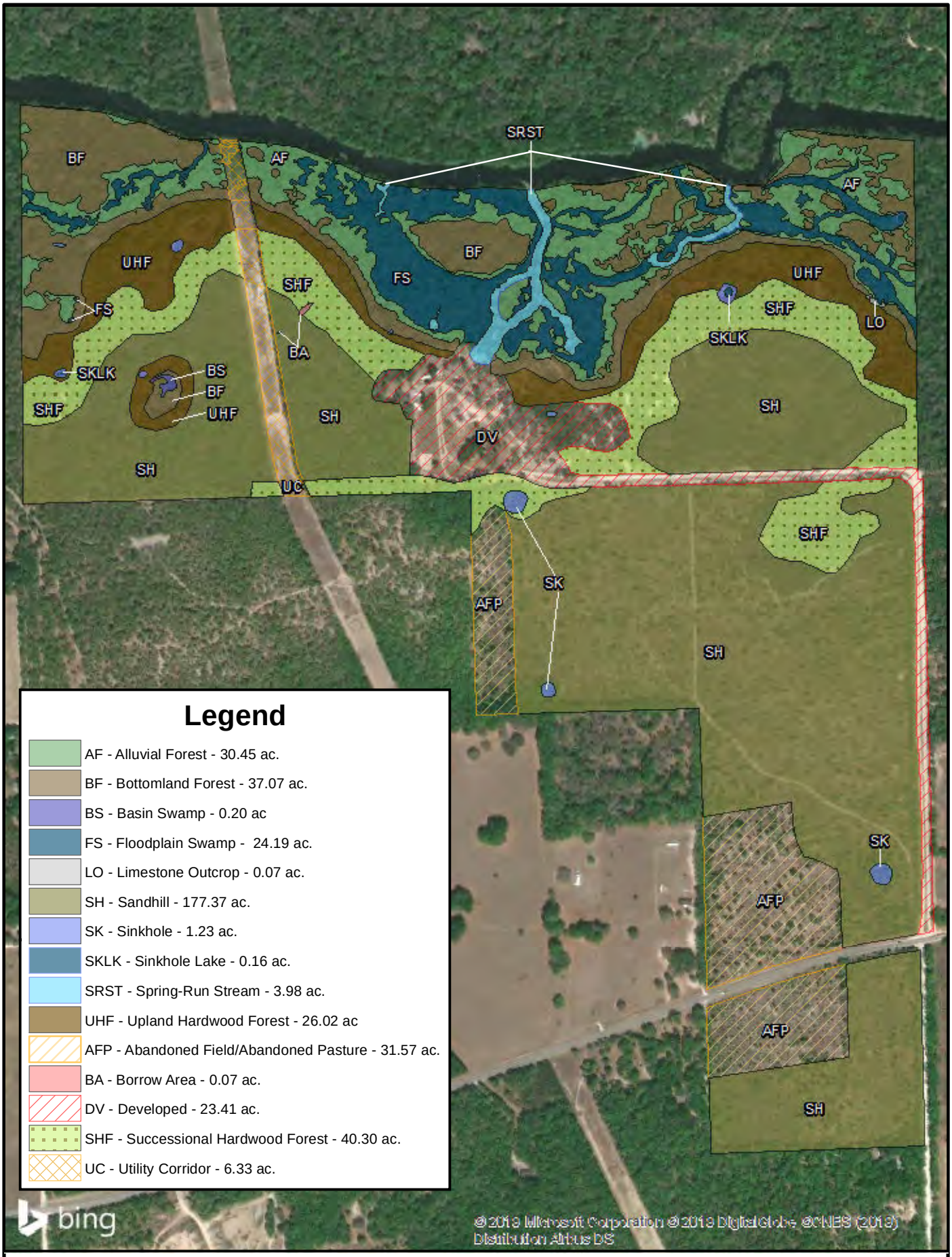
Even though most of the sandhills at the park are in poor condition because they have been impacted by agriculture, silviculture, and fire suppression, it is encouraging to see that large areas of native groundcover remain onsite. Scattered clumps of wiregrass (*Aristida stricta* var. *beyrichiana*) and other characteristic sandhill groundcover species are found in all areas that were not converted to pasture in the past. Aerial photography from 1937 shows that limited areas of zones GBS-4, GBS-5, and GBS-6 were converted to pasture prior to that date.

Nearly all areas of the sandhill community in the park have large pockets of offsite hardwoods due to the absence of fire on this property. The southern zones have scattered areas of young laurel oaks and sweetgums due to the pine harvesting activities. The zones to the north, GBS-1e, GBS-1w, and GBS-3 have extensive stands of mature laurel and sand live oaks. GBS-3 has been extensively fragmented by a network of sand roads and trails that are the result of a large informal camping area. The impacts to the remnant groundcover species are greatest in the areas closest to the main spring use area. The scattered remnant longleaf pines and groundcover patches offer some degree of hope for sandhill restoration in these areas.

A significant area of the sandhill was cleared as part of a major powerline corridor that bisects the western end of the park. This area is dominated by pasture grasses and weedy vegetation.

Pocket gophers (*Geomys pinetis*) and scattered gopher tortoises are still found onsite, along with eastern diamondback rattlesnakes. Therefore, it is likely that many other sandhill animal species have been able to persist.

Desired Future Condition: Dominant pines will be longleaf pine in north Florida. Herbaceous cover is 80% or greater and is 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 some turkey



Legend

- AF - Alluvial Forest - 30.45 ac.
- BF - Bottomland Forest - 37.07 ac.
- BS - Basin Swamp - 0.20 ac
- FS - Floodplain Swamp - 24.19 ac.
- LO - Limestone Outcrop - 0.07 ac.
- SH - Sandhill - 177.37 ac.
- SK - Sinkhole - 1.23 ac.
- SKLK - Sinkhole Lake - 0.16 ac.
- SRST - Spring-Run Stream - 3.98 ac.
- UHF - Upland Hardwood Forest - 26.02 ac
- AFP - Abandoned Field/Abandoned Pasture - 31.57 ac.
- BA - Borrow Area - 0.07 ac.
- DV - Developed - 23.41 ac.
- SHF - Successional Hardwood Forest - 40.30 ac.
- UC - Utility Corridor - 6.33 ac.

RUTH B. KIRBY
GILCHRIST BLUE SPRINGS
STATE PARK

N

0 250 500 1,000 Feet

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

NATURAL COMMUNITIES
MAP - EXISTING
CONDITION

oaks may be more than 100 years old. The Optimal Fire Return Interval for this community is 1 to 3 years.

General Management Measures: Fire is the primary tool for maintaining and improving sandhill vegetation. The park's 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. In addition, consideration will be given to removal or chemical control of the larger offsite hardwoods in the northern zones. The southern zones will require planting with longleaf pines as soon as possible after the initial prescribed fires.

Sinkhole and Sinkhole Lake

Description and Assessment: Due to the karst geology of the region, numerous sinkholes and depressions are scattered throughout the park. Some sinks remain dry the entire year, while others may contain water permanently or seasonally. The sinkholes within the park are relatively undisturbed and in good condition, however, at least one sinkhole in the park has evidence of being used as a trash dump. The sinkhole lakes include sinkholes in uplands areas that retain water, and which may or may not have a direct connection with the Floridan aquifer, as well as sinkhole lakes at lower elevations in the floodplain which likely have direct Floridan aquifer connections.

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 and being buffered by the lower elevation and a tree canopy. Desired future conditions include limiting unnatural erosion and protecting the microclimate from disturbance.

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.

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. Direct access to

these features, particularly the sinkhole lakes, should be limited to research purposes and resource management activities. Monitoring of these communities for impacts from invasive plant and animal species, is needed.

Upland Hardwood Forest

Description and Assessment: Within the park, historical aerials show a relatively thin band of hardwoods of varying width located upslope of the floodplain along the Santa Fe River. This transitional upland hardwood forest between the floodplain and sandhill communities has expanded upslope as a band of successional hardwood forest due to fire suppression in the past century. The boundary between the upland hardwood forest and sandhills is naturally dynamic and determined by local fire regimes and other disturbances such as windstorms. A portion of the upland hardwood forest was cleared as part of the powerline corridor. The upland hardwood forest within the park is in good to excellent condition with few impacts noted.

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.

General Management Measures: Management of the upland hardwood forest will require periodic monitoring and removal of invasive plant and animal species. Impacts from service roads and trails will require monitoring. Abandonment and restoration of unnecessary roads will also be pursued.

Alluvial Forest

Description and Assessment: At Gilchrist Blue Springs, the alluvial forest occurs as a narrow strip along the Santa Fe River created by sand deposition, and as slightly elevated terraces associated with lower floodplain swamps within the floodplain. These alluvial forest terraces occur at an intermediate level above the floodplain swamp and below the bottomland forest. These three floodplain community types are defined by the flooding regime based on topographic elevation but may be difficult to distinguish at times. These community types have been mapped using a digital elevation model derived from LIDAR data obtained from the SRWMD. This high-resolution topographic dataset allows these areas to be mapped much more accurately than previously possible. The alluvial forest in the park is in excellent condition; however, in the northwest portion of the park it has been impacted by the powerline corridor.

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.

General Management Measures: Maintenance of a natural hydrological regime is critical to the long-term health of this community. Alluvial forest requires little active management other than protection from erosion impacts, control of feral hogs, and control of invasive exotic plant species.

Basin Swamp

Description and Assessment: The basin swamp at Gilchrist Blue Springs is embedded within the western uplands. Intermittent overland flow from the Santa Fe River into this basin swamp during flood periods may play a hydrological role in this wetland. Basin swamps typically receive some inflow and can produce outflow, but they are not as heavily influenced by riverine systems as are floodplain swamps. Overall, the basin swamp is in good to excellent condition, with only a minimal sign of hog rooting disturbance.

Desired Future Condition: Basin swamps are forested basin wetlands that are highly variable in size, shape, and species composition and often hold water most days of the year. While mixed species canopies are common, the dominant trees in north Florida will be pond cypress (*Taxodium ascendens*) and swamp tupelo (*Nyssa sylvatica* var. *biflora*). Other canopy species will typically include slash pine (*Pinus elliottii*), red maple (*Acer rubrum*), dahoon holly (*Ilex cassine*), sweetbay (*Magnolia virginiana*), loblolly bay (*Gordonia lasianthus*), and sweetgum (*Liquidambar styraciflua*). Depending upon fire history and hydroperiod, the understory shrub component will be distributed throughout or concentrated around the perimeter. Shrubs will include a variety of species including Virginia willow (*Itea virginica*), swamp dogwood (*Cornus foemina*), wax myrtle (*Myrica cerifera*), and titi (*Cyrilla racemiflora*). The herbaceous component will also be variable and may include a wide variety of species such as maidencane (*Panicum hemitomon*), ferns, arrowheads (*Sagittaria* spp.), lizard's tail (*Saururus cernuus*), false nettle (*Boehmeria cylindrica*), and sphagnum moss (*Sphagnum* spp.). Soils will typically be acidic nutrient-poor peats, often overlying a clay lens or other impervious layer.

General Management Measures: Prescribed fires need to burn into the edges of basin swamps to maintain the natural ecotone between them and surrounding uplands. The park's basin swamp needs protection from the impacts of erosion and feral hog rooting.

Bottomland Forest

Description and Assessment: The bottomland forest at Gilchrist Blue Springs occurs as a broad low-lying terrace that lies on the slopes below the upland hardwood forest and as rises and terraces within the floodplain. Bottomland forest is usually found at slightly higher elevations than alluvial forest, and inundation does not occur on an annual basis. In general, however, Santa Fe River flooding does heavily influence the bottomland forest of the park. Recent hurricanes and flooding did tip

up a significant number of larger trees in the bottomland forest, but this is a natural successional process in these forests. A portion of the bottomland forest was also cleared as part of the powerline corridor. Overall, the bottomland is in good to excellent condition.

Desired Future Condition: Bottomland forest is a relatively low-lying, mesic to hydric community prone to periodic flooding. It is found on terraces and levees in river floodplains and in shallow depressions. Bottomland forest will typically have a closed canopy of mature deciduous and evergreen trees. The overstory in north Florida will usually contain species such as sweetgum (*Liquidambar styraciflua)*, sweetbay *(Magnolia virginiana)*, loblolly bay (*Gordonia lasianthus*), water oak (*Quercus nigra*), live oak (*Quercus virginiana*), swamp chestnut oak (*Quercus michauxii*), loblolly pine (*Pinus taeda*), and spruce pine (*Pinus glabra*). Red maple (*Acer rubrum*) and bald cypress (*Taxodium distichum*) may also be present. The understory will be open or dense. Understory species will typically include wax myrtle (*Myrica cerifera*), dwarf palmetto (*Sabal minor*), and swamp dogwood (*Cornus foemina*). Groundcover presence will be variable and may consist of witchgrass (*Dicanthelium* sp.) and various sedges (*Carex* spp.).

General Management Measures: Prescribed fires will be allowed to burn into the edges of bottomland forests to help maintain the natural ecotone between them and adjacent uplands. Some areas within these wetlands may require protection from erosion impacts along old roads or trails. The DRP should determine whether any roads/trails cause significant enough hydrological harm to warrant their restoration to natural contour. Monitoring for signs of invasive exotic plant species and feral hogs will continue.

Floodplain Swamp

Description and Assessment: Floodplain swamps at Gilchrist Blue Springs occur adjacent to the Santa Fe River and in association with the various spring-run streams and floodplain channels in the park. Bald cypress and swamp tupelo are the dominant tree species, both of which are adapted to long-term flooding. In many cases, floodplain swamp and alluvial forest are difficult to distinguish from each other and form a complex mosaic based on local topography. A portion of the floodplain swamp was also cleared as part of the powerline corridor. The floodplain swamps at Gilchrist Blue Springs are in excellent condition.

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 typically will be sparse.

General Management Measures: Maintenance of a natural hydrological regime is critical to the long-term health of this community. Floodplain swamps require little active management other than protection from erosion impacts, control of feral hogs, and control of invasive exotic plant species.

Blackwater Stream

Description and Assessment: The Santa Fe River is a blackwater stream that forms the north boundary of the park. Additional information about the river is included in the Hydrology section above. While the condition of the river, despite declining water quality and quantity, is still generally good, erosion is occurring along portions of the riverbank. Some of the erosion is attributable to natural flooding and some is a result of increased visitor use. Within the lower Santa Fe River region, the influence of groundwater flow is especially important.

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. During low-flow periods in the Santa Fe, groundwater will constitute a significant amount of the overall river discharge, and water clarity becomes exceptional in this region. The flow of the Santa Fe, especially within the lower river basin, depends greatly on groundwater discharge from springs such as Gilchrist Blue Spring. 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.

General Management Measures: Management of a complex aquatic system such as the Santa Fe River is a difficult task. Many impacts to this system have their origins either upstream or far from groundwater sources, and management considerations must necessarily extend beyond the park boundary, such as tracking and commenting on agency permits that regulate land use changes within the springshed, and research partnerships with the goal of defining springshed boundaries through dye trace research. Protection of the Lower Santa Fe River basin springsheds should be a priority for the Division. The park and district staffs will continue to work with state agencies responsible for monitoring water quality and quantity on the river and will continue to support the basic and applied research that is ongoing within this watershed.

Spring-Run Stream

Description and Assessment: Gilchrist Blue Spring is fed by the Floridan aquifer primarily through a single, large aquatic cave opening at the main headspring. This second-magnitude spring vent discharges to a short narrow spring-run stream that joins the Santa Fe River about 1,200 feet to the north. Two additional smaller spring vents are tributary to the main spring-run, including Naked and Little Blue springs. Naked Spring is the largest of the two and contributes nearly a third of the overall discharge (Scott et al. 2004). Numerous smaller spring-run streams and seepages occur within the park, along the edges of the river within the adjacent

floodplain and contribute to the flow of the Santa Fe River. Please see additional springs information above under the Hydrology section.

Across Florida, water scientists are studying numerous water quality and quantity issues that can threaten the health of spring-run stream ecosystems. There are many issues being studied including eutrophication, nuisance macroalgae, ecosystem brownouts from river flooding, wildlife herbivory, recreational pressures, SAV (underwater forest) declines, and reductions in groundwater discharge to name a few.

When the Santa Fe River is under extreme flood conditions, Gilchrist Blue and its numerous smaller spring-run streams can reverse flow and the aquatic cave system can act as an estavelle, with tannic surface water pushing into the Floridan aquifer. Unnaturally elevated nutrient levels in the groundwater (eutrophication) have caused increased periphyton growth on SAV within most of Florida's spring-run streams. Because sunlight is an essential SAV growth requirement, extreme algae covering aquatic plants can cause severe die-off's in spring ecosystems.

These stream systems can also experience high turbidity levels associated with peak periods of recreational use. Gilchrist Blue Spring has long been attractive to outdoor recreation enthusiasts, and activities such as wading and walking on the spring bottom subject this aquatic system to highly intensive, and potentially destructive pressures. Extensive damage occurs to both the SAV (uprooting) and stream bottom, particularly in the area around the main spring vent.

Foot traffic in the spring run 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. Surface water column turbidity, coupled with increased periphyton growth, can have a harmful effect on SAV, and by extension, the species that depend on them.

Additionally, Gilchrist Blue and Naked headsprings and the adjacent upslope terraces have undergone years of significant and repeated soil erosion with a high volume of stormwater runoff and sedimentation impacting the spring ecosystems and the adjacent Santa Fe River. The upslope terrace around both springs is considered in poor condition.

It is important to note that SAV is an important dietary component for a variety of native wildlife such as Florida manatees (*Trichechus manatus*) and freshwater turtles, and therefore the amount of SAV biomass in this spring system can be highly dependent on the amount of foraging pressure (Johnston et al. 2018). Additionally, SAV biomass in this spring system can be influenced by significant flood or brown-out events (see Hydrology section above).

Since the year 2018, the DRP has documented the nearly complete collapse of several species of SAV in both Gilchrist Blue and Naked spring-runs. Four dominant SAV taxa that are strong indicators of a "healthy spring" as mentioned above under the hydrology section appear to have significantly declined in both springs at

Gilchrist. Spring-tape and eelgrass have virtually disappeared since 2019 in both systems. Prior to this 2018 SAV collapse, the Gilchrist ecosystem was one of only two remaining springs (rivaled only by the Ichetucknee) with healthy dense and diverse aquatic plant beds within the Lower Santa Fe River Basin. As of 2019, the spring-run was dominated by a dense monoculture of nuisance benthic macroalgae with very few large continuous beds of native SAV. The Hydrology section above describes the deteriorating condition of the spring-run streams in the park and the various factors that may have contributed to its decline. Based on these factors, plus recently declining flows in the Lower Santa Fe River, the Gilchrist Blue and Naked spring-run streams are considered in poor condition.

There are two highly invasive non-native SAV species that are found throughout the Santa Fe River, Gilchrist Blue Springs, and their spring-run streams, namely hydrilla (*Hydrilla verticillata*) and Indian swampweed (*Hygrophila polysperma*). Hydrilla heavily predominates the main spring, but both are found all throughout the system. FWC has long had an herbicide program to control hydrilla in the Santa Fe River.

Desired Future Condition: Perennial water courses which derive most, if not all, of their water from limestone artesian openings from the underground aquifer. The waters will be typically cool, clear, and circumneutral to slightly alkaline. These factors allow for optimal sunlight penetration and minimal environmental fluctuations which promote plant and algae growth. However, the characteristics of the water can change significantly downstream as surface water runoff becomes a greater factor. Areas of high flow will typically have sandy bottoms while organic materials concentrate around fallen trees and limbs and slow-moving pools. Typical SAV will include spring-tape (*Sagittaria kurtziana*), eelgrass (*Vallisneria americana*), creeping primrosewillow (*Ludwigia repens*), southern waternymph (*Najas guadalupensis*), muskgrass (*Chara* sp.), Stonewort (*Nitella* sp.) and pondweed (*Potamogeton* sp.). Additionally, numerous species of emergent plants typical of spring-run streams includes pickerelweed (*Pontederia cordata*), spiderlily (*Hymenocallis* sp), annual wild rice (*Zizania aquatica*), spotted water hemlock (*Cicuta maculata*), and spatterdock (*Nuphar advena*). All of these aquatic plants are considered important to maintain the structural component of the “underwater forest” in a spring-run stream community.

General Management Measures: Since many factors affecting the spring-run stream originate outside the park within the Gilchrist Blue springshed, management considerations must necessarily extend beyond the park boundary. Within the 420 square mile region of the Gilchrist Blue springshed, Division priorities should be focused on protection of groundwater sources, surface and groundwater quality, and factors important to spring discharge, including maintenance of historic spring flows at the parks springs. DRP will also continue to work with appropriate state and federal agency stakeholders such as the FDEP, SRWMD, FFS, and USFWS in seeking ways to restore the ecological health of the park’s spring ecosystems. Park and District 2 DRP staff will continue to coordinate with the appropriate water experts and the numerous research projects associated with the river and its springshed.

In order to protect the ecological health of spring ecosystems, DRP's priority management efforts within the park will include protection of surface water quality of park waterbodies, protection, restoration and monitoring the parks spring-run stream communities, and implementation of a responsible operational plan for recreational use of Gilchrist Blue Spring. Additional details of the operational plan for recreation at Gilchrist is located below under the Land Use Component of this plan.

District and park staff will monitor and mitigate any stormwater runoff or other contamination threats that might occur within surface waterbodies of the park and especially associated with developed areas adjacent to springs or other sensitive karst features. The Division should upgrade the park septic systems to the highest level feasible and use advanced treatment technologies.

Considering the poor ecosystem health that has resulted from a near collapse of SAV at Gilchrist and Naked, DRP will develop and implement a restoration plan aimed to protect these two springs from additional harm as described above in Objective C under the Hydrology section. Integral to this restoration plan is the protection and monitoring of existing native SAV at Gilchrist and potentially implementing an experimental reestablishment program to enhance the growth of aquatic plant beds in the park.

To quantify significant ecosystem changes at Gilchrist and Naked springs, monitoring will consist of two separate annual assessments including a complete SAV characterization along a known transect, and spatial mapping of major aquatic plant beds and diversity as well as a continuous visual assessment of SAV and water clarity.

District and park staff will coordinate with Alachua EPD/KES to continue supporting their on-going SAV monitoring transects that were initiated in 2017. Submerged aquatic vegetation transect work is generally conducted in the Spring season. DRP will work collaboratively with these researchers during their monitoring efforts.

In conjunction with SAV transects described above, District biological staff will conduct an annual SAV mapping and monitoring assessment of Gilchrist and Naked using visual, photographic and video to document the spatial extent of all major aquatic plant beds within these two spring ecosystems. The mapping surveys will occur approximately six months after the transect surveys.

Additionally, park staff will continuously document and track notable changes in aquatic plant beds at these two spring systems. Staff will be note significant increases in sedimentation, loss of native SAV, increases of non-native SAV, and sustained increases in surface water column turbidity. Similarly, staff will also continuously document and track brownouts and water clarity at select karst features in the park to identify significant changes that might be occurring in these natural communities, especially at Gilchrist and Naked springs. Details concerning

Santa Fe River flooding and spring brownouts is found above under the Hydrology section of this plan.

DRP will also continue cooperation with on-going turtle researchers to further understand any potentially significant herbivory events within the system. Monitoring of the spring-run stream for impacts from invasive plant and animals is always necessary. DRP will develop a plan to remove hydrilla to keep the infestation at maintenance levels.

The Division should carefully implement a recreational use plan for of Gilchrist Blue Spring, one that offers visitors an natural experience at one of Florida's iconic springs as well as protects its beauty and biological diversity. Integral to protection of ecosystem diversity will need to be healthy aquatic plant beds within the "underwater forest" of these springs.

Efforts to educate visitors that recreate in Gilchrist Blue should focus on best management practices to protect the spring bottom from erosion and reducing damage to aquatic plant beds. The impacts from visitor foot traffic that occurs on the spring bottom within both the headspring and spring-run stream are because of the naturally shallow conditions of Gilchrist and Naked. Sediments that are disrupted from the spring bottom in shallow areas result in increased surface water column turbidity and reduced sunlight to SAV downstream from the original point of disturbance. Turbidity is a direct water quality issue that can negatively influence natural growth rates of SAV in spring ecosystems.

Sedimentation from erosion that originates on the upslope terraces and shoreline around Gilchrist Blue and Naked springs can also influence the water quality of the spring ecosystem. DRP will use best management practices to design and restore the natural shoreline contours around Gilchrist and Naked spring, while considering a sustainable recreational access into the Gilchrist Blue headspring. This restoration will include stabilizing the natural upslope terraces and shoreline at both springs.

Subterranean Cave - Aquatic

Description and Assessment: Aquatic caves are associated with all springs within the park to a greater or lesser extent and lie beneath much of the park. At this time there are only a few aquatic caves that have been mapped in the park, but these are only associated with the adjacent Devil's Ear Spring system to the west. Nonetheless, the conduit system associated with the Gilchrist Blue Springs caves are likely to be very extensive and may have a significant connection to the Devil's Ear caves.

The Gilchrist Blue Springs aquatic cave system appears to be in good condition, from the paucity of cave research that is available. Much of the information available to DRP biologists about the condition of these caves is derived from communications with volunteer cave divers. The National Speleological Society Cave Diving Section is an active volunteer group at the park and is a consistent source of data, but as of 2019, a formal assessment of the overall health of the Gilchrist Blue cave system had not taken place. Extensive mapping of the adjacent

Ginnie Springs cave system to the west of Gilchrist Blue Spring has occurred. The springshed boundary between Ginnie and Gilchrist Blue is currently unknown at this time, but portions of the Ginnie cave conduits may overlap underground beneath the park.

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. Aquatic caves vary from shallow pools that are highly susceptible to disturbance to systems that are more stable and totally submerged. Cave systems are extremely fragile. Protection from alterations that may increase pollution in aquatic systems, changes that may affect flows, light penetration or microclimate is critical.

General Management Measures: DRP will continue to coordinate and cooperate with the cave diving community on research projects associated with the river, Gilchrist Blue Spring, and its springshed. Periodic monitoring of the aquatic caves by cave divers will allow park staff to track changes in the caves and assess impacts to the Gilchrist Blue headspring. Research dives throughout the cave system will provide DRP staff with detailed information about cave conditions.

It is very important that district and park staff begin to understand the upstream conduit connections for the Gilchrist Blue springshed, specifically the conduit system that is connected to the Devil's Ear Cave system that divers are currently exploring. Dye trace work in the Gilchrist Blue springshed is lacking, and any research that expands our understanding of the connections between the Ginnie and Gilchrist Blue springsheds could fill a large gap in our knowledge of groundwater movement in this region, especially outside the park boundary.

To prevent silting in of the aquatic caves, staff will have to carefully monitor the erosion of slopes above the spring run and correct problems as they arise. A significant amount of planning will be necessary in order for the park to control visitor access more effectively and restore the shoreline area of this spring.

Altered Landcover Types

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

Abandoned Field / Abandoned Pasture

Portions of zones GBS-4, GBS-5, and GBS-6 were converted to improved pastures prior to 1937. These areas were subsequently planted with pines at least once, with the last pines being harvested in 2008-2009. Bahia grass (*Paspalum notatum*) still occurs onsite and most of the groundcover is made up of weedy species. Like the adjacent sandhills in the same zones, there was no pine regeneration or planting after the last harvest. These former pasture/plantation areas will be burned along with the adjacent sandhills and will be planted with longleaf pines. These areas may need selective herbiciding of the remnant pasture grasses and may require seeding

with native groundcover species to aid restoration of the sandhill natural community.

Borrow Area

There are several borrow areas scattered across the property, primarily in zone GBS-1e. The largest is a shallow borrow area along the service road west of the shop. At least two smaller borrow areas are located immediately adjacent to the powerline. These borrows were likely used as a source of fill onsite, prior to state ownership. There are no current plans to fill in borrow areas, but the goal would be to restore these areas back to the appropriate historic natural community.

Developed

The developed area of the park is associated with the main spring. The day use area is centered around the main spring. Development there consists of a toll booth, parking area, picnic pavilions, and bathrooms. To the east of the main spring are campsites, and to the west are the shop and concession facilities.

Management of the developed areas will include removal of all priority invasive exotic plants (FLEPPC Category I and II species). Other management measures will include proper stormwater management and the designing of future development so that it is compatible with springs and river protection and prescribed fire management in adjacent natural areas.

Utility Corridor

A significant electric utility line corridor bisects the NW portion of the park and is maintained by Duke Energy. The lines run roughly north-south across the park and pass over the Santa Fe River. Removal of the tree canopy occurred in the early 1960s and these areas are kept open by routine maintenance. Should these utility corridors ever be abandoned, the desired future conditions would include sandhill, upland hardwood forest, and floodplain natural communities. General management measures include control of priority invasive plant species and prescribed fire in the former sandhill. The park will coordinate with Duke Energy to try to minimize the impacts of the utility corridors on adjacent natural communities and on the aesthetics of the state park.

Successional Hardwood Forest

The successional hardwood forests occur along the ecotone between the upland hardwood forest and sandhill community. Due to fire exclusion in the sandhills, laurel oaks and other offsite hardwoods moved into the sandhills from the adjacent upland hardwood forests. In addition, the sand live oaks in the sandhills expanded and created closed canopy areas due to lack of fires. Areas closest to the main spring were also heavily impacted by informal campsites that were established along with a network of trails and unimproved roads. Scattered adult longleaf pines still persist in these areas. Native groundcover species are present in some areas

and will likely become more prevalent as the prescribed fire program proceeds. The desired future condition for the successional hardwood forest is sandhill.

Restoration efforts will require removal of the offsite hardwoods through chemical or mechanical treatment. It may also be necessary to do supplemental plantings with native groundcover species and longleaf pines. Ongoing management of these areas will include removal of all priority invasive exotic plants (FLEPPC Category I and II species) that are encountered.

Resource Management Activities

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

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 plant and 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 wildland fuels.

All prescribed burns in the Florida state park system are conducted with authorization from the FDACS, Florida Forest Service (FFS). Wildfire suppression activities in the park are coordinated with the FFS.

Prescribed fire is planned for each burn zone on the appropriate interval. 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. In order to track fire management activities, the DRP maintains the Natural Resource Tracking System (NRTS). NRTS allows staff to track various aspects of each park's fire management program. NRTS is used for annual burn planning which allows the DRP to document fire management goals and objectives on an annual basis. Each annual burn plan is developed to support and implement the broader objectives and actions outlined in this ten-year management plan. Each quarter, reports are produced that track progress towards meeting annual burn objectives.

Natural Community Restoration: In some cases, the reintroduction and maintenance of natural processes is not enough to reach the desired future conditions for natural communities 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 may 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 community 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, and small-scale vegetation management (see Natural Communities - Desired Future Conditions Map).

Natural Community 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 A: Complete a comprehensive floral and faunal survey and create/update the park's baseline plant and animal list.

Action 1	Complete a comprehensive survey.
Action 2	Create a baseline plant and animal list.

Initial plant and animal surveys were conducted in late 2017 after acquisition of the park by the State of Florida. Additional surveys will be required to develop a more comprehensive species list. Surveys in other seasons of the year will allow detection of migratory animal species and will facilitate identification of plant species during growing and flowering seasons.

Objective B: Within 10 years, have 250 acres of the park maintained within the optimum fire return interval.

Action 1	Develop/update annual burn plan.
Action 2	Manage fire-dependent communities by burning between 85 - 235 acres annually.
Action 3	Create 1.4 miles of perimeter firebreaks.

Table 3 contains a list of all fire-dependent natural communities found within the park, their associated acreage and optimal fire return interval, and the annual average target acreage to be burned.

Table 3: Prescribed Fire Management		
Natural Community	**Acres**	**Optimal Fire Return Interval (Years)**
Sandhill	177	1-3
Abandoned Field/Abandoned Pasture	32	1-3
Successional Hardwood Forest	40	2-3
Utility Corridor	6	1-3
Annual Target Acreage	85-235	

Most of the park is either current or former sandhills. The sandhills to the south of the entrance road retain scattered native groundcover species despite having slash pines planted and harvested. No longleaf pines remain in zones GBS-4, GBS-5, and GBS-6, but enough native grasses and herbaceous species persist to carry fire. Offsite hardwoods are scattered across these zones, but the pine harvesting in 2008-2009 has left the site relatively open. Zones GBS-1e, GBS-1w, and GBS-3 north of the entrance road retain scattered, adult longleaf pines with patches of native groundcover, including wiregrass. However, these zones are heavily invaded by offsite hardwoods, making prescribed fire more difficult.

Initial onsite burns should concentrate on the southern zones as completely as possible to reduce hardwoods and stimulate groundcover species in preparation for replanting with longleaf pines. Initial burns in the northern zones should concentrate on burning existing groundcover patches and introducing low intensity fires in the vicinity of the adult longleafs to gradually reduce accumulated duff layers. The annual burn goal for the park is 85 to 235 acres per year.

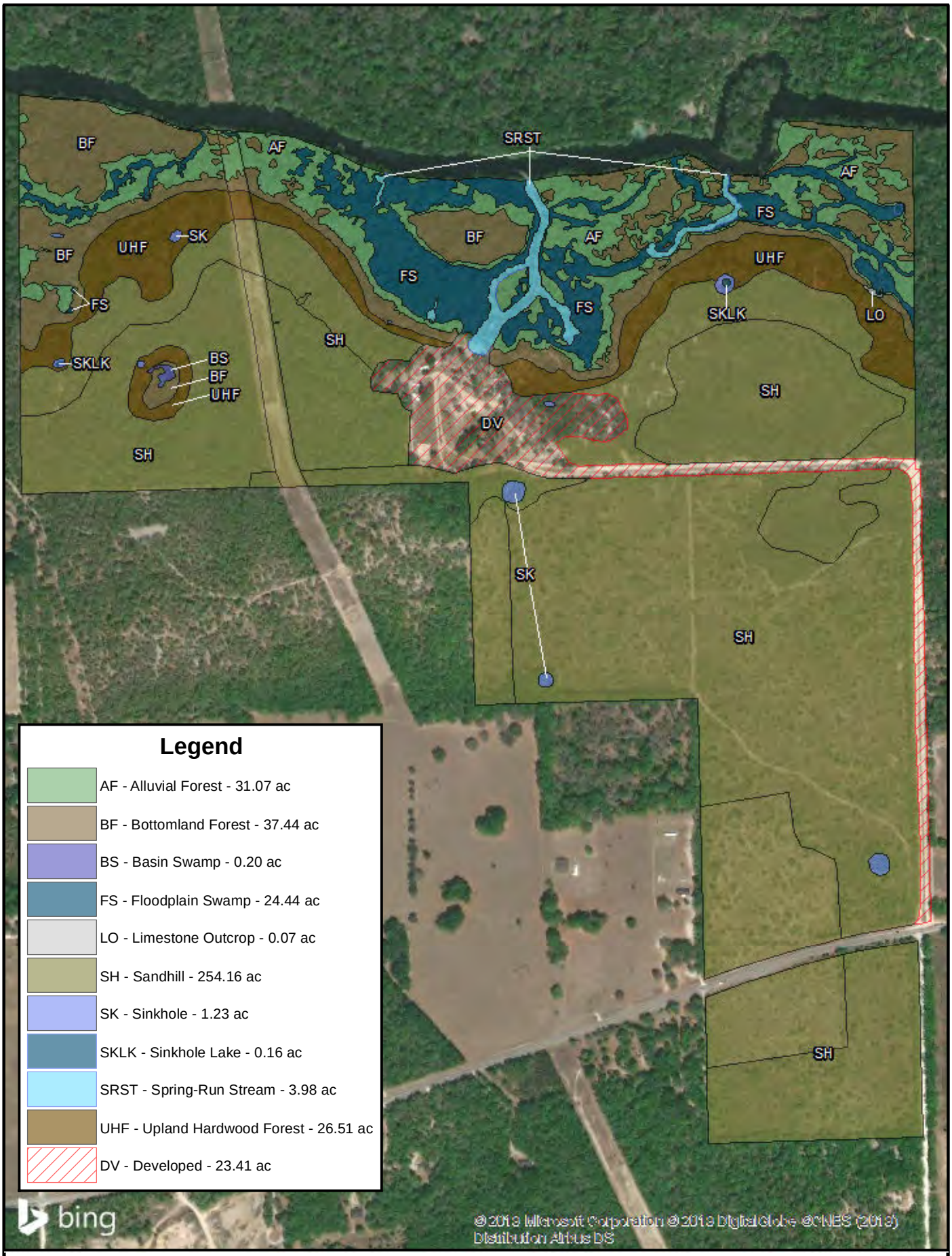
Although much of the park boundary is protected by a perimeter road that can be used as a firebreak, approximately 1.4 miles of the park boundary will need a perimeter road/firebreak installed. Approximately 40 acres of former sandhill is classified as successional hardwood forest. Removal of offsite hardwoods may be necessary in this area, and in some of the sandhills, to help promote better penetration of prescribed fires.

The sandhills at Gilchrist Blue Springs still support a population of gopher tortoises, and may also support burrow commensals. Frequent burning of the sandhills will be essential to sustain and increase the gopher tortoise population onsite.

Objective C: Conduct natural community/habitat improvement activities on 276 acres of sandhill natural community.

Action 1 Mechanically and/or chemically treat offsite hardwoods in the 32-acre abandoned field in zones GBS-4, GBS-5, and GBS-6.

Action 2 Plant longleaf pine in zones GBS-4, GBS-5, and GBS-6 on 148 acres of sandhill and abandoned pasture after the initial burn.



RUTH B. KIRBY
GILCHRIST BLUE SPRINGS
STATE PARK

N

0 250 500 1,000 Feet

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

NATURAL COMMUNITIES
MAP - DESIRED FUTURE
CONDITION

Action 3 Mechanically and/or chemically treat 96 acres of selected hardwoods adjacent to existing longleaf pines in zones GBS-1w, GBS-1e, and GBS-3.

Action 4 Determine need for treatment of exotic pasture grasses and native groundcover seeding in addition to longleaf pine planting.

Action 5 Promote native groundcover improvement as needed.

The park has areas of sandhill that were recently logged but contain good native groundcover. These areas are lacking fire and longleaf pines. Adjacent to this and within the same management zones are smaller areas with offsite hardwoods and some exotic pasture grasses mixed with native ground cover. All of these areas are lacking longleaf pines. Some areas may need treatment of exotic pasture grasses as well as offsite hardwoods.

Approximately 32 acres of offsite hardwoods in zones GBS-4, GBS-5, and GBS-6 need mechanical and/or chemical treatment. Because of the presence of exotic pasture grasses in parts of zones GBS-4, GBS-5, and GBS-6 (percent cover ranges from 5 to 50%) these areas may need additional treatment of the exotic grasses and supplemental planting of native sandhill groundcover. Post-mechanical and chemical treatment and fire, all of these acres should be planted with longleaf pine at the rate of 400-500 trees per acre.

The sandhill and successional hardwood forest in zones GBS-1w, GBS-1e, and GBS-3 retain mature longleaf pines embedded in a matrix of excessively high-density mature sand live oaks and laurel oaks. This is due to the absence of fire over many years. To stimulate the native groundcover and improve the effects of prescribed fire, numerous hardwoods including sand live and laurel oaks adjacent to remnant longleaf pines will be identified for removal.

After zones have undergone hardwood treatment and prescribed fire, zones will be evaluated for the presence of native groundcover and exotic grasses. Subsequent improvement needs will follow the post treatment and fire evaluations.

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), NOAA – National Marine Fisheries Service (NMFS), Florida Fish and Wildlife Conservation Commission (FWC), or the Florida Department of Agriculture and Consumer Services (FDACS) as endangered, threatened, or of special concern.

Initial plant and animal surveys of the park have detected several imperiled species. Additional surveys will be needed to document additional imperiled species within the park. The only imperiled plant species detected so far is the rainlily (*Zephyranthes atamasca*) which occurs in the floodplain areas of the park and along the spring-run streams. Potential threats to this species include damage by feral hogs and recreational foot traffic.

Imperiled reptiles within the park include the gopher tortoise, American alligator, and Suwannee alligator snapping turtle. A gopher tortoise burrow survey was conducted by the previous landowner. Staff will request those data from the previous owner as a baseline population estimate for gopher tortoises in the park. Any future surveys should utilize the Line Transect Distance Sampling technique recommended by FWC (Smith et al. 2009). The aquatic turtles at Gilchrist Blue Springs have been monitored as part of a long-term population study by researchers from Santa Fe College and other institutions (Johnston et al. 2016, Johnston et al. 2018). The Suwannee alligator snapping turtle is one focus of these ongoing studies. Staff will continue to facilitate research within the park to monitor trends in turtle populations.

Federally listed wood storks and West Indian manatees have also been observed within the park. Staff will monitor the spring runs for the presence of manatees and will ensure that recreational activities do not disturb manatees within the park. This is particularly important during colder weather when manatees may be seeking warm water refugia.

Table 4 contains a list of all known imperiled species within the park and identifies their status as defined by various authorities. It also identifies the types of management actions that are currently being taken by DRP staff or others, and identifies the current level of monitoring effort. The codes used under the column headings for management actions and monitoring level are defined below the table. Explanations for federal and state status as well as FNAI global and state rank are provided in Appendix 6.

Table 4: Imperiled Species Inventory

Common and *Scientific Name*	**Imperiled Species Status**				**Management Actions**	**Monitoring Level**
	FWC	**USFWS**	**FDACS**	**FNAI**		
PLANTS						
Rainlily *Zephyranthes atamasca*			LT		4,10	Tier 1
REPTILES						
American alligator *Alligator mississippiensis*	FT (S/A)	SAT		G5,S4	10	Tier 1
Gopher tortoise *Gopherus polyphemus*	ST			G3,S3	1,6,7,10,13	Tier 2

Table 4: Imperiled Species Inventory						
Common and *Scientific Name*	**Imperiled Species Status**				**Management Actions**	**Monitoring Level**
	FWC	**USFWS**	**FDACS**	**FNAI**		
Suwannee alligator snapping turtle *Macrochelys suwanniensis*	ST			G2,S2	4,10	Tier 2
BIRDS						
Wood stork *Mycteria americana*	FT	LT		G4,S2	4	Tier 2
MAMMALS						
West Indian manatee *Trichechus manatus*	FT	LT		G2,S2	4,10	Tier 1

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 and 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.

Resource Management Activities

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

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 that 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.

In the preparation of this management plan, DRP staff consulted with staff of the FWC's Imperiled Species Management Section or that agency's 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 USFWS, FWC, 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 impact imperiled species in the park. Management of imperiled species will be guided by Florida's Imperiled Species Management Plan (FWC 2016) and appropriate Species Action Plans.

Objective A: Develop baseline imperiled species occurrence inventory lists for plants and animals.

Action 1 Develop baseline imperiled species occurrence inventory lists for plants and animals.

Initial surveys at the park have detected several imperiled species, but additional surveys are needed to establish an accurate list of imperiled species.

Objective B: Monitor and document 4 selected imperiled animal species in the park.

Action 1 Develop monitoring protocols for 1 selected imperiled animal species, including the West Indian manatee.

Action 2 Implement monitoring protocols for 4 imperiled animal species, including those listed in Action 1 above and the Suwannee alligator snapping turtle, the gopher tortoise and imperiled bird species.

District staff will work with park staff to develop a monitoring/reporting system to track the use of the spring-runs by West Indian manatees. This information will be shared with appropriate FWC, USFWS, and SRWMD staff as needed. Staff will also continue to work with the researchers from Santa Fe College and the North American Freshwater Turtle Research Group to facilitate the long-term monitoring of the turtle populations at Gilchrist Blue Springs and other state parks along the Santa Fe River. In December 2017, Gilchrist Blue Springs was included for the first time in the Ichetucknee/Santa Fe/O'Leno Christmas Bird Count. This annual count will be used to monitor all avian species in the park, including any imperiled species.

Objective C: Monitor and document 1 selected imperiled plant species in the park.

Action 1 Implement monitoring protocols for 1 imperiled plant species, the Rain Lily.

The rain lily, the only imperiled plant species detected so far within the park, is relatively common. As the imperiled plant list is expanded through additional survey work, additional monitoring may be necessary for specific species.

Exotic and Nuisance Species

Exotic species are plants or animals not native to Florida. Invasive exotic species are able to outcompete, 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.

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 and cultural resources attributed to exotic animals, the DRP actively removes exotic animals from state parks, with priority being given to those species causing the greatest 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 venomous snakes, raccoons and alligators that are in public areas. Nuisance animals are dealt with on a case-by-case basis in accordance with the DRP's Nuisance and Exotic Animal Removal Standard.

A complete survey for invasive exotic plants will need to be conducted at the park. District biological staff conducted brief initial surveys in late 2017 over several visits and observed a few localized non-native plant species. From these brief surveys as well as other records in 2017, four Florida Exotic Pest Plant Council (FLEPPC)

Category I species were discovered, including mimosa (*Albizia julibrissin*), Chinese tallow (*Triadica sebifera*), hydrilla, and Indian swampweed (*Hygrophila polysperma*).

Hydrilla (*Hydrilla verticillata)* and Indian swampweed were present in the park's springs and spring-run streams. Historic photos of the spring and spring-run from as late as March 2017 indicate that significant portions of the upper third of the stream were dominated by hydrilla. Both of these highly invasive SAV species are found all throughout the system. Impacts of Hurricane Irma in 2017 completely browned out the entire spring and may have caused a temporary die-off of hydrilla.

Two other non-native plants not on a FLEPPC list but found in the park include pitted beardstem (*Bothriochloa pertusa*) and centipede grass (*Eremochloa ophiuroides*). These two species are of concern because they may present an unexpected challenge for future groundcover restoration within the sandhill community. The exotic pasture grass, Bahia grass is also present. It is of less concern during restoration but it should be treated in areas outside of the day use area of the park.

Table 5 contains a list of the FLEPPC Category I and II invasive, exotic plant species found within the park (FLEPPC 2017). Table 5 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.

Table 5: Inventory of FLEPPC Category I and II Exotic Plant Species

Common and Scientific Name	FLEPPC Category	Distribution	Management Zone (s)
PLANTS			
Chinese tallow *Triadica sebifera*	I	1	GBS-5
Mimosa *Albizia julibrissin*	I	1	GBS-5
Indian swampweed *Hygrophila polysperma*	I	3	GBS-2
Hydrilla *Hydrilla verticillata*	I	5	GBS-2

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.

Plant and Animal Disease and Nuisance Insects

If symptoms of disease in native plant or animal populations are observed and appear to be spreading in any park, the DRP will consult with FFS or FWC, as appropriate, to determine an appropriate and timely management response.

In 2002, the red bay ambrosia beetle (*Xyloborus glabratus*) was first detected in the United States in southeast Georgia. The beetle carries a 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. It was first detected in Gilchrist County in 2012. The beetle (and laurel wilt) has now spread throughout most of Florida and into many of the neighboring states.

It is not currently known if laurel wilt is present in the park although in neighboring parks most adult red bay trees have been top-killed by this beetle-transmitted disease. Fortunately, red bay trees can re-grow from their root systems. It may be that members of the Lauraceae family will continue to survive in shrub form as the remnant tree root systems continue to grow. At this point, much remains unknown about the long-term impacts of this disease on red bays and other Lauraceae. Since visitors hauling firewood can transport the ambrosia beetle, park staff should restrict the movement of firewood into and out of the park and educate visitors about the issue.

Mosquito control occurs on some state parks. All DRP lands are designated as “environmentally sensitive and biologically highly productive” in accordance with Section 388.4111, Florida Statutes. If a local mosquito control district proposes treatment, the DRP works with them to adopt a mutually agreeable plan. By policy of the DEP since 1987, treatment plans may not include aerial adulticiding but typically allow larviciding. DRP policy also allows park managers to request typical truck spraying (adulticide fogging) in public use areas even in the absence of a treatment plan. The DRP does not authorize new physical alterations of marshes through ditching or water control structures. Mosquito control plans temporarily may be set aside under declared threats to public or animal health, or during a Governor’s Emergency Proclamation.

There has been no arthropod management plan developed for Gilchrist Blue Springs State Park.

Resource Management Activities

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

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

Objective A: Annually treat all infested acres of exotic plant species in the park.

Action 1 Annually develop/update exotic plant management work plan.
Action 2 Implement annual work plan by treating all upland acres in the park and continuing maintenance and follow-up treatments, as needed.
Action 3 Develop a specific plan to monitor, track, and eradicate non-native SAV (especially hydrilla and Indian swampweed) from the park's spring systems.

The DRP calculates the acreage of exotic plants proposed for treatment using the concept of "infested area." The concept defines an area of land (Gross Area Acres) and multiplies the number of acres by the percent cover of exotic plants to estimate the infested acres. This calculation provides an estimation of area (acres) covered by the exotic plants if the plants were accumulated into one area. This methodology more accurately estimates the actual acres of plants removed (DRP Invasive Exotic Plant Protocol 2013).

Currently the number of infested acres in the park is not known since a complete survey has yet to be conducted. Based on preliminary surveys it appears that the number of infested acres will be quite low with the possible exception the spring-run area.

While it is known that hydrilla and Indian swampweed are present in the spring run it has not be possible to determine their abundance without further survey effort. However, historic photos of the spring run indicate that significant portions of at least the upper third of the stream is predominated by hydrilla. Impacts of Hurricane Irma in 2017 completely browned out the entire spring and may have caused a temporary die-off of hydrilla. DRP will develop a plan to monitor these non-native species, and to manage them.

To protect the park from further spread of centipede grass and pitted beardstem, the park should develop a mowing and fireline protocol that includes recognition of these species, control of known populations, and an equipment decontamination protocol that avoids spreading the species via mowers and during fireline construction and maintenance.

Objective B: Implement control measures on 1 exotic animal species in the park.

Action 1 Control feral hogs on an as needed basis.

Feral hogs (*Sus scrofa*) are present in the park, but only a small amount of sign has been observed at this time. DRP staff will monitor damage and implement control measures as needed.

Special Natural Features

The most significant natural features at Gilchrist Blue Springs State Park are the two second-magnitude freshwater springs and the numerous other springs scattered across the property. Several limestone outcrops are also scattered across the park's landscape, including at least one significant outcrop in the eastern portion of the property.

Despite the heavy recreational use that the two main springs of the park endure in the warmer seasons, many of the spring ecosystems on the property still retain their natural character. At certain times of the year, Gilchrist Blue and Naked Spring offer a magically spectacular crystal blue glimpse of the Floridan aquifer. Nonetheless, visible changes to these spring ecosystems are happening below the surface. Like so many of our other Florida springs, the health of the Gilchrist Blue Springs is declining due to offsite impacts. Nitrates, pesticides, and other pollutants, carried in runoff to sinks or percolating through the soil within the springshed, have found their way into the underground conduits that feed the many springs at the park. A combination of flooding events, herbivory and recreational use has also impacted large sections of SAV within the spring, and much of this aquatic vegetation is covered by nuisance periphyton. Long-term preservation of the Gilchrist Blue Springs will require close monitoring of impacts to SAV and the spring's overall water quality.

Cultural Resources

Description and Assessment

This section addresses the cultural resources present in the park that may include archaeological sites, historic buildings and structures, cultural landscapes, and collections. The Florida Department of State (FDOS) maintains the master inventory of such resources through the Florida Master Site File (FMSF). The DRP Bureau of Natural and Cultural Resources maintains the master inventory of its collections. Section 267.061, F.S., 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 (NRHP). Appendix 8 contains the FDOS, Division of Historical Resources (DHR) 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 (NHRP), and the Secretary of the Interior's definitions for the various preservation treatments (restoration, rehabilitation, reconstruction, and preservation). For the purposes of this plan, the term "significant" refers to those cultural resources listed, eligible for listing, or potentially eligible for listing in the NRHP. To be eligible for listing, cultural resources must be at least 50 years old or of exceptional importance if younger. This plan includes cultural resources that are at least 50 years old or of exceptional importance or that will reach 50 years of age during the term of this plan.

Evaluating the condition of cultural resources is accomplished using a three-part evaluation scale, expressed as good, fair, and poor. These terms consider the site's current level of stability and the rate and amount of decline in its condition. The rating is not a comparison of the site's present condition to an idealized 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 a 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.

Table 6 contains the name, FMSF number, cultural or temporal period, and cultural resource type (FMSF category) of all the cultural sites within the park that are listed in the FMSF. The table also summarizes each site's level of significance, present condition, and recommended preservation treatment. An explanation of the codes is provided below the table.

Table 6: Cultural Sites Listed in the Florida Master Site File

Site Name and FMSF #	Cultural/Temporal Period	Resource Type	Significance	Condition	Treatment
GI20 Between Blue and Lily Springs	Paleoindian	Archaeological Site	NE	F	P
GI21 Blue Spring	Prehistoric	Archaeological Site	NE	F	P

Significance:

NRL	National Register listed
NR	National Register eligible
NE	Not evaluated
NS	Not significant
II	Insufficient Information

Condition

G	Good
F	Fair
P	Poor
NA	Not accessible
NE	Not evaluated

Recommended Treatment:

RS	Restoration
RH	Rehabilitation
P	Preservation
R	Removal
N/A	Not applicable

Prehistoric and Historic Archaeological Sites

Description and Assessment: The park has two known archaeological sites: GI20 and GI21. These sites were originally recorded in 1966 and artifacts are stored in

the Simpson Collection at the Florida Museum of Natural History. Very little is known about these pre-historic sites. A site visit conducted by BNCR cultural resources staff in November 2017 assessed their condition as FAIR.

8GI20 was plotted as a General Vicinity (GV) site, meaning its exact location was unknown and was recorded from a vague, verbal description. James Dunbar updated the FMSF for 8GI20 in 1993 indicating the site had an underwater Paleoindian Period component in the Santa Fe River. The site is not specifically mentioned in the underwater survey of the Santa Fe River (Smith et al 1997). The river bottom up and down stream of Rum Island was inspected (Smith et al 1997: 51-53) but artifacts were sparse. This was apparently the basis for the 1997 FMSF update. A survey of Rum Island Springs County Park across the Santa Fe River in Columbia County (Hendryx 2003) identified a small lithic scatter (8CO927) that was considered ineligible for listing on the National Register.
8GI21 is described as concentrated in and around the spring head, in the spring run and along both sides of the spring run down to the Santa Fe River. The spatial extents of 8GI20 and 8GI21 have not been established with archaeological testing so current boundaries are poorly defined. Artifacts from these sites are included in the Simpson collection housed at the Florida Museum of Natural History. BNCR has archived digital images of these artifacts.

No predictive sensitivity model or detailed surveys have occurred in the park. The primary threats to the sites are human foot traffic and potential disturbance during the development of park facilities.

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.

Historic Structures and Collections

Description and Assessment: The park does not contain any historic structures. The park does not currently maintain a collection of archival material, historic objects, natural history objects, or archaeological objects. An archaeological collection reported to be from 8GI20 and 8GI21 is maintained at the Florida Museum of Natural History in Gainesville. A preliminary review of this collection by BNCR Cultural Resources staff indicates the sites are associated with the Middle Archaic Period (7000 B.P. – 4000 B.P.) and Deptford Period (500 B.C. – 200 A.D). A Paleoindian (c. 12,000 B.P. – 9,500 B.P.) projectile point was recorded in the FMSF record for 8GI20 which indicates that site may date to that time as well.

Resource Management Activities

Goal: Protect, preserve, interpret, 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 preservation 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 NRHP must be submitted to the FDOS, Division of Historical Resources (DHR) for review and comment prior to undertaking the proposed project. DHR recommendations may include, but are not limited to concurrence with the project as submitted, monitoring of the project by a certified archaeological monitor, cultural resource assessment survey by a qualified professional archaeologist, or 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 the DHR for consultation and the DRP must demonstrate that there is no feasible alternative to removal and must provide a strategy for documentation or salvage of the resource. Section 267.061, F.S., further requires that the DRP 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 the DHR.

Objective A: Assess and evaluate the physical condition of 1 cultural site in the park.

Action 1 Complete DRP condition assessment of site GI21.

Before a protection plan can be developed, a condition assessment for GI21 is needed. Little information about this site is known at this time.

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

Action 1 Ensure all known archaeological sites have been recorded with the FMSF. Any new sites discovered will be recorded with the FMSF.

Action 2 Complete an archaeological sensitivity model for the park.

Action 3 Consult with DHR Compliance Review in advance of any ground disturbance.

Action 4 Develop a protocol to address archaeological artifacts found in the park and report any finds according to DRP procedures.

Action 5 Develop and adopt a Scope of Collections Statement that indicates the park will not maintain a collection.

Action 6 Conduct oral history interviews with the park's previous owners.

Gilchrist Blue Springs is a new park that has recently entered public ownership. It is important that a predictive model be completed. Phase 1 survey may be required prior to any ground disturbing activity. Consultation with DHR Compliance Review must be conducted well in advance if ground disturbance is anticipated. More research is needed on the pre-Columbian history of the park and its relation to the cultures along the Santa Fe River.

Objective C: Bring 1 of 2 recorded cultural resources into good condition.

Action 1 Develop a protection and treatment plan for site GI21.

At this time, it is unknown what, if any, management measures are needed. This will be determined as part of a condition assessment.

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. The 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 reestablish old-growth characteristics to the degree practicable, with the exception of those communities specifically managed as early successional.

A timber management analysis was not conducted for this park since its total acreage is below the 1,000-acre threshold established by Section 253.036, F.S.

Submerged Lands Management

The Trustees have granted management authority of certain sovereign submerged lands to the DRP under Management Agreement MA 68-086 (as amended January 19, 1988). Management of Gilchrist Blue Springs State Park may include certain management activities within the buffer zone of sovereign submerged land, beginning at the mean high water or ordinary high-water line, or from the edge of emergent vegetation extending waterward for 400 feet and all sovereign submerged lands surrounded by any state park.

This area includes the portion of the Santa Fe River, a blackwater stream, that runs along the north boundary line of the park. Visitors may access the river from the park, or by boat from access points outside the park. Management activities in the buffer zone will include removal of trash and other litter, protection of imperiled

species, resource inventories and monitoring, and control of visitor access to the park.

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 considered recommendations of the land management review team and updated this plan accordingly.

This is the first management plan developed for Ruth B. Kirby Gilchrist Blue Springs State Park. The park has not yet been subject to a land management review.

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 begin 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 the 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 systematically analyze various planning issues such as location, regional demographics, adjacent land uses and the park’s potential interaction with other conservation and recreation lands.

Gilchrist Blue Springs is in Gilchrist County along the Santa Fe River in the north central part of the state. This area of the state is well known for the many spectacular freshwater springs that can be found along the Suwanee and Santa Fe Rivers. Resource-based recreational opportunities are plentiful in the region. Many of area’s springs are in public ownership and have been developed into public parks that offer a range of recreational activities including camping, swimming and paddling. Several springs are privately owned and maintained as for-profit recreation areas. Table 7 identifies significant resource-based recreation opportunities within 20 miles of the park.

Table 7. Resource-Based Recreational Opportunities Near Ruth B. Kirby Gilchrist Blue Springs State Park

Name	Biking	Hiking	Swim / Beach Access	Boating / Paddling	Fishing	Wildlife Viewing	Overnight Stay	Hunting	Equestrian Facilities
O'Leno State Park (FDEP)	✓	✓	✓	✓	✓	✓	✓		
River Rise Preserve State Park (FDEP)	✓	✓		✓	✓	✓	✓		✓
Mill Creek Nature Preserve (Alachua County)	✓	✓				✓			
San Felasco Hammock Preserve State Park (FDEP)	✓	✓				✓			✓
Santa Fe River Odum Preserve (Alachua County)				✓	✓	✓			
Poe Springs Park (Alachua County)		✓	✓	✓	✓	✓			
Rum Island Park (Columbia County)			✓	✓	✓	✓			
Ginnie Springs (Private)	✓	✓	✓	✓		✓	✓		
Fort White Wildlife and Environmental Area (FWC)	✓	✓		✓	✓	✓		✓	
Ichetucknee Springs State Park (FDEP)		✓	✓	✓		✓			
Hart Springs (Gilchrist County)	✓	✓	✓	✓	✓	✓	✓		
Nature Coast State Trail (FDEP)	✓	✓				✓			
Fanning Springs State Park (FDEP)		✓	✓	✓	✓	✓	✓		
Dudley Farm Historic State Park (FDEP)		✓				✓			

Gilchrist County is a largely rural county with a total estimated population of just over 18,000 in 2018 (US Census 2018). The local economy is primarily supported by agriculture, including dairy farming, and the lumber industry. Family groups make up the majority of the county population and the median age per individual is 40. Growth in Gilchrist County is anticipated to be modest;

with medium estimates projecting a population size of just over 20,000 by 2040 (BEBR 2018). Gilchrist County is working to capitalize on the unique natural resources of the region by actively promoting sustainable ecotourism.

Neighboring Alachua County serves as the regional hub for retail and other services due to the presence of the University of Florida. In 2010, Gainesville and Alachua County accounted for half of the total population of the region. The current estimated population of Alachua County is 269,956 with a median age of 30. Medium estimates project that Alachua County's population will exceed 300,000 residents in 2040 (BEBR 2018). Alachua County's growth is largely attributed to the presence of the University of Florida and Santa Fe College, as well as a robust health services industry.

The North Central Florida Strategic Policy Plan is a long-range plan for the physical, economic, and social development of the region. The plan identifies a series of regional goals concerning affordable housing, economic development, emergency preparedness, natural resource protection, and regional transportation. Overall, the regional economy has been relatively stable. State and local government, especially in education and prisons, remains a significant employer in the region, followed by health care and retail trade. The region has a growing nature and eco-tourism base that capitalizes on the region's natural springs and rivers. The plan recognizes the region's natural resources as an important component of the economy and quality of life and encourages development and economic activity that does not adversely affect the region's natural resources. (NCFRPC 2018)

The park is located within the North Central Vacation Region. In 2017, it is estimated that just over 1 million people (<1%) of the 118 million tourists that traveled to, or within Florida, visited this area of the state. Seventy-four percent of visitors to this region traveled for leisure, and most leisure travelers were visiting friends or relatives. Tourist visitation to the region peaks during the winter (Dec-Feb) with an average stay of 2.5 nights. In fact, the North Central region had the highest percentage of domestic winter visitors among all the vacation regions in the state. The lowest levels of tourist visitation occur during the summer (Jun-Aug). A large majority of visitors to the region (85%) traveled by non-air transport (such as by car or RV), and a majority (60%) also paid for overnight accommodations. Visiting a park (national/state) was a top activity for eight percent of visitors to the region, however hiking was a top activity in the North Central region, higher than any other region in the state. (Visit Florida! 2017).

Discussion continues regarding the need for major transportation corridor improvements within this region, and DRP will need to monitor long-range transportation planning at the state level for potential impacts to the park and its resources.

Interstate 75 (I-75) connects the region to central and south Florida, as well as the Southeastern U.S. and is the major transportation conduit of visitors and new residents. The Florida Department of Transportation (FDOT) created the I-75 Relief Task Force in 2015 to provide recommendations on maximizing existing, and developing new, high-capacity transportation corridors to serve the Tampa Bay to Northeast Florida area. The Task Force made two recommendations that could affect this region. The first is to transform I-75 from Hernando to Columbia counties by expanding its capacity and improving its safety, efficiency, and reliability. The second was to preserve the function and improve the capacity of U.S. 41 from Hernando to Columbia counties, in coordination with local communities (FDOT 2017). Capacity improvements to U.S. 41 would have the greatest potential for impact to the park, as U.S. 41 runs directly through the nearby town of High Springs but both recommendations could have a negative impact on the water resources of the park. However, no major improvements to either I-75 or U.S. 41 are planned for the immediate future.

In the spring of 2019, the Florida Legislature directed the FDOT to consider further expansion of the state's toll road system. In response, FDOT has created the Multi-use Corridors of Regional Economic Significance (M-CORES) program. The intent of this effort is to consider a broad range of social, economic and environmental issues that may benefit from toll road expansion. The M-Cores program is currently assembling task forces to study three specific corridors. Gilchrist County is one of eight counties under study for the Suncoast Connector; proposed to extend from Citrus County to Jefferson County. This task force will work in coordination with the FDOT to consider the need for the corridor and its potential economic and environmental impacts. This may include recommendations to combine right-of-way acquisition with the acquisition of conservation lands and conservation easements. A specific emphasis of the task force is to study how project design and land acquisition can mitigate the impact of road construction on the natural resources of the region. Task force recommendations are expected by October 1, 2020 (FDOT 2019).

In all planning for Gilchrist Blue Springs it is important to recognize that the water resources of the region are under increasing pressure from reoccurring drought, regional groundwater withdrawal and pollution. Excessive groundwater withdrawal to support agricultural uses or water bottling operations is a serious concern as average spring flows have declined significantly within the springs along the Santa Fe River. Additionally, the region's springs are highly vulnerable to nutrient pollution from fertilizers and animal waste. Elevated levels of nitrogen within the spring can lead to an increase in harmful algae and the loss of native vegetation. The largest sources of nitrogen appear to originate from the regular use of fertilizer, aging septic systems, and municipal wastewater. State agencies, local governments, academic institutions, non-profit organizations, and advocacy groups are all working to raise awareness about the condition of the region's freshwater springs, conduct research and

implement strategies to conserve and protect the region's distinct water resources.

Existing and Planned Use of Adjacent Lands

No large-scale land use changes are anticipated in the immediate vicinity of the park. Lands around the park are largely characterized by a mix of agricultural land, low density residential development, and public conservation land. Ginnie Springs, a privately-owned recreation site is located on the park's western boundary. Ginnie Springs is a popular destination for scuba diving, swimming, camping, and paddling. Low-density private residential development occurs along the park's eastern boundary. The county vision outlined in the Gilchrist County Comprehensive Plan is "rural communities working in harmony to provide opportunities for all its citizens through balanced growth and enhanced education, while preserving our proud heritage, natural resources and agriculture." (Gilchrist County 2018).

The park's northern boundary is formed by the Santa Fe River, and the park includes a large area of forested floodplain and floodplain swamp influenced by the river's hydrology. The wide river floodplain continues along both shores of the Santa Fe River to the east and west of the park. A utility corridor traverses the park property from north to south on the western side of the main use area. Agricultural lands and low-density residential continue to the park's south. An industrial water bottling facility is located just outside of the park boundary about 4,000 feet to the southwest of the main spring vent on two adjacent 40-acre parcels.

Florida Greenways and Trails System (FGTS)

The Florida Greenways and Trails System (FGTS) is made up of existing, planned and conceptual non-motorized trails and ecological greenways that form a connected, integrated statewide network. In some cases, existing or planned priority trails run through or are adjacent to state parks, or they may be in the vicinity and can be connected by a spur trail. State parks can often serve as trailheads, points-of-interest, and offer amenities such as camping, showers and laundry, providing valuable services for trail users while increasing state park visitation.

Gilchrist Blue Springs State Park is located along the Gilchrist Blueway, a 55-mile paddling corridor along the Santa Fe and Suwannee Rivers created to provide sustainable recreational opportunities that encourage stewardship and the protection of natural resources in Gilchrist County.

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's 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. Breaking down the property into such elements provides a means for measuring the property's capability 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

The park consists of more than 300 acres of accessible land above the floodplain of the Santa Fe River. A significant area of the park was previously modified to allow for the current recreational uses at the park. This area includes the large cleared parking area at the top of the slope adjacent to the main spring and a substantial live oak hammock with a cleared understory that contains the existing campground. Continued use and reuse of existing disturbed areas will support gradual redevelopment of recreational facilities and limit additional impacts to the park's natural communities. Approximately 90 acres of the property lie within the 100-year floodplain along the river. The floodplain contains many large trees and interesting karst features that could be accessible via boardwalks and trails. In addition to the developed areas and the floodplain the park contains a mix of upland forested areas such that are suitable for hiking, wildlife viewing and primitive camping.

Water Area

Gilchrist Blue Spring is very popular for swimming. Several additional springs are also located on the property and one additional spring, Naked Spring is also used for swimming and snorkeling. Gilchrist Blue Spring is a second magnitude spring with an average discharge of approximately 40 million gallons of freshwater along a ¼ mile spring-run that empties into the Santa Fe River. The Gilchrist Blue Spring-run is one of the longest spring-runs on the Santa Fe River and often recognized as one of the few remaining spring runs with a substantial "underwater forest" of submerged aquatic vegetation.

Florida's spring ecosystems are extremely sensitive to disturbance by human foot traffic, and recreational use of springs can have a detrimental effect on the submerged aquatic vegetation within the spring. However, the park's history demonstrates that recreational use does not preclude the continued presence of aquatic vegetation. This indicates that controlled recreational use of Gilchrist Blue Spring and spring-run may be sustained through careful monitoring for recreational impacts and quick implementation of appropriate mitigation should

impacts occur. Recreational use of the other springs and spring-runs on the property, such as Naked Spring, should be discontinued because of their extremely sensitive nature, and in some cases their small size, in order to support the long-term conservation and protection of these fragile resources.

Shoreline

The park borders more than a mile of the Santa Fe River; however, the river shoreline is not easily accessible from the main use area of the park due to the presence of the wide forested floodplain. The relatively large sandy shoreline around the main headspring is accessible to most park visitors. Unfortunately, access to the main spring requires visitors to frequently traverse up down and across the slopes of the spring bowl. This creates erosion and subsequent sedimentation within the main spring. Additionally, the approach to the spring is steep and not universally accessible.

Natural Scenery

The most impressive sight upon arrival at the park is the pronounced topographic relief evident on the southern approach to Gilchrist Blue Spring. The sudden drop in elevation provides a dramatic natural overlook of the main springhead and spring-run. Visitors can also experience views of the park's floodplain from along Gilchrist Blue spring-run including the beautiful confluence of the Gilchrist Blue and Naked spring-run streams. At the confluence of the main spring-run and Santa Fe River, visitors can experience the unusual effect of the clear spring water flowing into the dark tannic water of the Santa Fe River as well as outstanding views of the river corridor.

Significant Habitat

The Gilchrist Blue Spring-run is renowned for supporting 10 species of turtle and a large population of snails that can help control the spread of algae and other invasive aquatic plants. One species of snail, *Elimia* sp., is of exceptional importance due to its ability to keep the spring-run clear of algae. Recreational use of the park's springs will require monitoring of potential recreational impacts to wildlife habitat.

Natural Features

The outstanding natural features of the park are Gilchrist Blue Spring, Naked Spring and their associated spring-runs. These features have long been recognized for their outstanding water clarity and once abundant and diverse submerged aquatic vegetation. The park also contains other distinctive karst features including limestone outcrops that can be found along the ecotone between the uplands and floodplain and scattered within areas of hardwood and bottomland forest. These features provide an outstanding opportunity to educate visitors about the karst topography of the region.

Archaeological and Historical Features

The park contains recorded archaeological sites; however, site boundaries are poorly understood. These features are not of the size or type that would require specialized interpretation for public benefit; and are best protected and left alone. The presence of additional cultural features within the park is likely. Advanced consultation with the Division of Historical Resources is critical prior to any ground disturbance. A trained Archaeological Resource Monitors (ARM) will be needed to ensure the identification and protection of cultural resources during the construction of future facilities.

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.

Current Recreational Use and Visitor Programs

The park is a popular destination for locals and state residents alike. Paddling, tubing, snorkeling, and swimming are very popular at the main headspring and along the spring-run. Picnic pavilions are available and a concession stand provides food, beverages and canoe and kayak rentals. Regular day use accounts for more than 80% of the park's annual visitation and peak day use at the park occurs during summer and throughout the year on weekends. An analysis of regional tourist data and park visitation data indicates that the park is most likely to be used by a diverse mix of family groups from the local or regional area.

Camping is available with several RV campsites with 30-amp electricity and additional sites without power. Camping is popular, and the campground can reach over 70% occupancy during the busy spring and summer seasons. A short nature trail provides access to several other interesting karst features as well as portions of the park's floodplain forest and upland sandhill.

The park currently offers interpretive and recreational programs on a limited basis. Ranger programs focus on the park's natural resources, and other specialized programs or activities tied to special events, like Junior Ranger Day, First Day Hikes and Earth Day.

Gilchrist Blue Springs Park recorded 69,141 visitors in FY 2017/2018. By DRP estimates, the FY 2017/2018 visitors contributed $5,845,699 in direct economic impact, the equivalent of adding 82 jobs to the local economy.

Legend

- Camp Site
- Hiking Trail
- Unstabilized Road
- Structure
- Parking Lot
- Park Boundary

SPRING RUN
SUWANNEE RIVER
JOHNSON SPRING
GILCHRIST BLUE SPRING
LITTLE BLUE SPRING
NAKED SPRING
SEE INSET
COUNTY ROAD 340

LITTLE BLUE SPRING
GILCHRIST BLUE SPRING
FIXED DOCK
NAKED SPRING
CONCESSION
KAYAK RACK
STORAGE
RESIDENCE
SWIMMING AREA
KAYAK STORAGE
PICNIC PAVILION
BATH HOUSE
SHOP
BBQ SHELTER
STORAGE
RESIDENCE
RANGER STATION
CAMPSITES
VOLLEYBALL COURT
GAZEBO
bing
© 2019 Microsoft Corporation ©
bing

RUTH B. KIRBY
GILCHRIST BLUE SPRINGS
STATE PARK

N
0 250 500 1,000 Feet
Florida Department of Environmental Protection
Division of Recreation and Parks
Date of aerial: 2016

BASE MAP

Past Uses

Prior to becoming a state park Gilchrist Blue Springs was a private recreation property owned by Blue Springs Properties, Inc. The private park offered swimming, snorkeling, RV and tent camping, kayak and canoe rental, pavilion rentals and general day use to tens of thousands of visitors annually.

Future Land Use and Zoning

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.

The Gilchrist County Future land use designations for the park are Environmentally Sensitive Area – 2 (ESA-2) and Agricultural-2 (A-2). The ESA-2 designation is reserved for areas within the 100-year floodplain located along the Suwannee and Santa Fe Rivers. Proposed land uses are required to provide mitigating measures to protect the natural functions of the County's environmentally sensitive areas. Densities within this category are limited to 1 dwelling unit per 10 acres overall. A special use permit is required for resource-based activities, such as campgrounds of less than 100 campsites. Campgrounds must maintain a ½ mile minimum distance from any other campground within the Environmentally Sensitive Area. However, the current campground at Gilchrist Blue Springs is specifically mentioned and may be expanded, provided that the combined number of existing campsites and additional campsites is less than 400. Within the A-2 designation, public parks and recreational areas are permitted, however campgrounds, concessions, and some park support facilities such as a shop, will require a special use permit.

Other Uses

A high intensity powerline owned and maintained by Duke Energy traverses the park from north to south and is located about a ¼ mile to the west of the main day use area. Duke Energy conducts the maintenance of the powerline corridor within the park.

Visitor Experience Zones (VEZ)

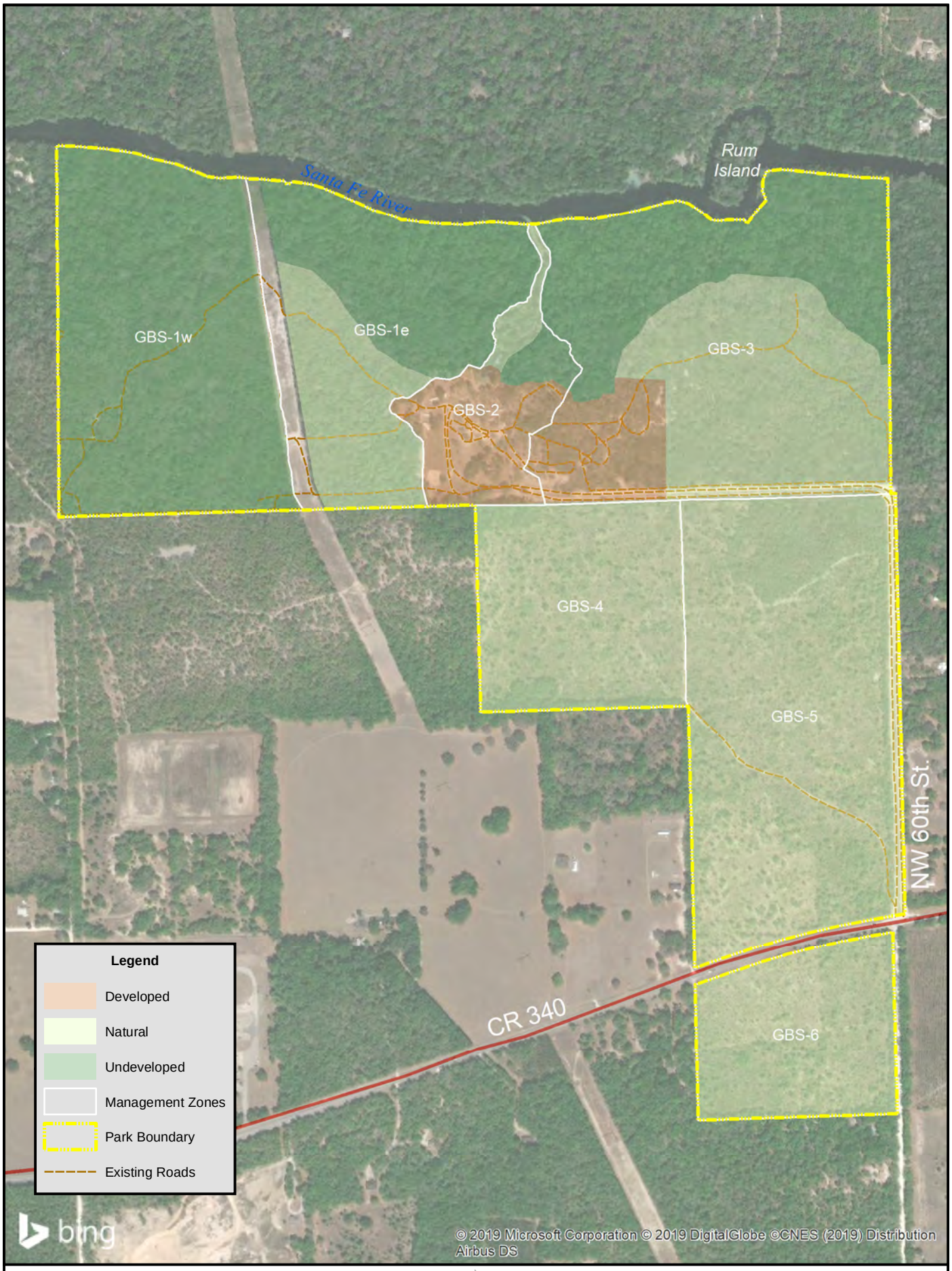
A series of land-use designations inform decision making on the development of the recreational opportunities and facilities to be provided in each park. Each VEZ allows DRP to promote a quality recreational experience by conserving the park’s resources and promoting recreation diversity. VEZ designations help guide management of visitor use patterns and facility design and placement.

The following designations are established for Gilchrist Blue Springs State Park (see VEZ map):

Developed
Developed areas include day use and support areas where most state park recreation activities are focused. Recreation infrastructure, including parking, roads, walking paths, picnic areas, campgrounds, etc., are often paved and provide a standard level of visitor comfort associated with conventional day use and overnight activities in a highly-modified natural setting. Socialization within and outside one's group is typical, and the presence of other visitors is expected. The developed area is typically attractive for day use by visitors from nearby communities, campground users, and others within a day's drive. This designation typically incorporates an auto-oriented site layout with parking and meandering roads. There is an obvious and highly visible management presence with signage, restrooms, and trashcans throughout the developed area. Groupings of support buildings including staff housing, shop buildings, and equipment storage are present but separated from the main visitor use areas. At Gilchrist Blue Springs the Developed Zone is designated for most of the recreational use areas created by the former private recreation site. This includes the park's current day use area and the main headspring, the parking area, campground, concession and other support facilities.

Natural
The natural designation denotes areas where recreational activity provides the opportunity for a high degree of interaction with the natural environment. There is only moderate evidence of a modified natural setting and socialization with others outside one's group is occasional, but the presence of others should be expected. Most visitor activities are limited to passive day-use recreation opportunities including hiking, biking, paddling, and wildlife viewing. Protection of critical resources is prioritized in the design and implementation of recreational programming and in the placement of trails, roads or other facilities. Other than the main park drive, roads and parking areas that service park facilities will be unpaved to minimize impacts to natural resources. Occasionally support facilities will be found in the natural area.

A Natural Zone is designated for areas adjacent to the park's main use area. These areas contain a mix of disturbed and successional forest, as well as remnant sandhill and the occasional karst feature. This zone incorporates most of the park due to past disturbance. The Natural Zone also includes the Gilchrist Blue spring-run. These areas of the park can also be impacted by the sights and sounds of adjacent roadways, the park's day use area and main entrance road. These areas are easily accessible from the main day use area and are well suited for nature trails, wildlife viewing and interpretive programming that could be developed in conjunction with natural community restoration efforts at the park. The portion of the park south of CR340 has been included within the Natural Zone due to past disturbance and the proximity to roadways. However, this area will be restored to provide a visual landscape buffer for the park entrance, promote biodiversity and provide aquifer recharge.



GILCHRIST BLUE SPRINGS STATE PARK

N

0 250 500 1,000 Feet

Florida Department of Environmental Protection
Division of Recreation and Parks

VISITOR EXPERIENCE ZONES

Undeveloped

The Undeveloped Zone will often include the park's highest quality and most sensitive natural resources. A sense of independence, freedom, tranquility, relaxation, appreciation of nature, testing of outdoor skills, and responsibility for resource stewardship is typical. The opportunity to experience a natural ecosystem with little human imprint, a sense of challenge, adventure, risk, self-reliance, and a feeling of solitude are all important characteristics of the undeveloped designation. This is where longer distance hiking trails and primitive camping opportunities may be located. It is an area of very limited recreational activity or development. Any development would prioritize limits to human impact visually and physically to help create as austere and rustic a visitor experience as is practical. There is little evidence of management presence with a leave no trace policy promoted. Support facilities are rare to non-existent.

Most of the park's sensitive areas have been included within the Undeveloped Zone. This includes the entire floodplain along the Santa Fe River, and most of the park's springs and spring-runs, including the Little Blue, Naked, and Johnson spring systems. An Undeveloped Zone is also designated for areas along the park's western boundary, west of the powerline. This area contains a mix of forest, sensitive wetland habitats, and additional karst features. This portion of the park may occasionally be impacted by sounds from adjacent land uses.

Existing Facilities

The park's recreational facilities are currently clustered around the main spring bowl. These facilities support the day use activities at the park, including swimming, picnicking, paddling and hiking. The park also contains a small full facility campground and additional non-powered campsites. A nature trail/interpretive loop trail begins near Naked Spring. The primary support facilities include a ticket booth, two staff residences, storage buildings and service roads (see Base Map).

<u>Recreation Facilities</u>

Day Use Area
Small Picnic Pavilions (3)
Medium Picnic Pavilions (2)
Volleyball Court (1)
Interpretive Kiosks (3)
Hiking Trail (.5 miles)
Bathhouse (1)
Parking (120 spaces)
Canoe/Kayak Launch
Shower Station

Campground
- Full Facility (18 sites)
- Non-powered (7 sites)

<u>Support Facilities</u>

Ticket Booth
Pole Barn
Storage Shed
Staff Residence (2)

Conceptual Land Use Plan

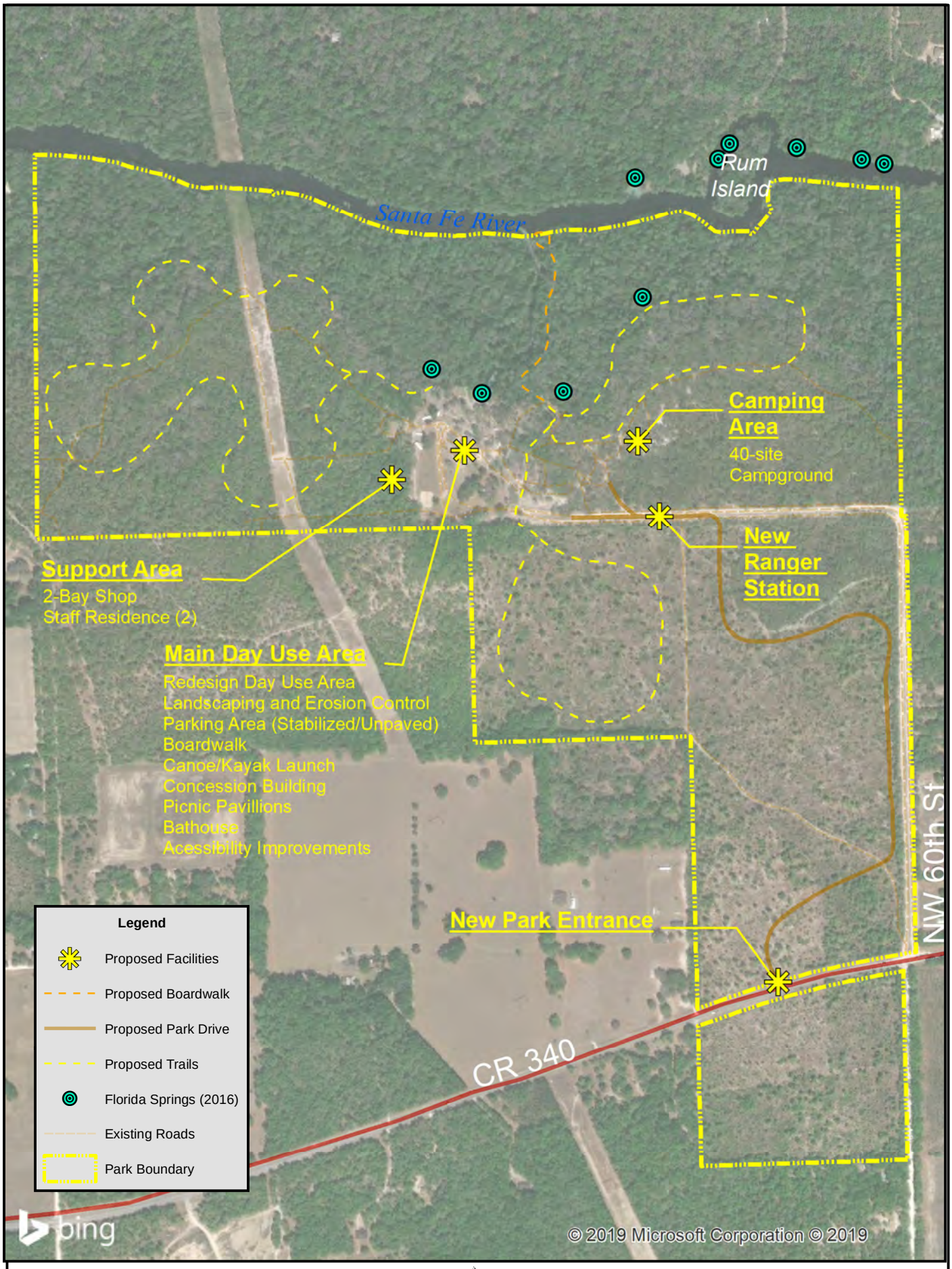
The following narrative represents the current conceptual land use proposal for this park. The conceptual land use plan is the long-term, optimal development plan for the park, based on current conditions and knowledge of the park's resources, landscape and social setting (see Conceptual Land Use Plan). 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 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.

Proposed Recreational Use and Visitor Programs

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

The goal of DRP is to provide appropriate resource-based recreational opportunities, interpretation and education that help residents and visitors connect to the real Florida. These activities are made available through the development of recreational facilities, educational programming, and the teaching of recreational skills. DRP manages its properties to provide for these activities in such a manner as to ensure that the natural and cultural resources within the parks are preserved and protected.



GILCHRIST BLUE SPRINGS STATE PARK

N

0 250 500 1,000 Feet

Florida Department of Environmental Protection
Division of Recreation and Parks

CONCEPTUAL LAND USE PLAN

Objective: Provide and develop public access through appropriate resource-based recreational activities.

Most of the existing recreational activities were established when the park was under private ownership. Paddling, picnicking, camping, hiking, swimming, and snorkeling are all appropriate resource-based recreation activities common to Florida State Parks and compatible to the resources of Gilchrist Blue Springs. Park management will focus on improving the quality of these recreational experiences through redevelopment of current park amenities and popular use areas, and the careful monitoring and mitigation of recreational impacts.

Visitor Use Management

The DRP manages visitor use to sustain the quality of park resources and the visitor experience, consistent with the purposes of the park. The dynamic nature of visitor use requires a deliberate and adaptive approach to managing resource impacts from recreational activity. To manage visitor use the DRP will rely on a variety of management tools and strategies, in addition to limiting the number of people within a certain park area. The foundations of this visitor use management strategy are the park's significant natural and cultural resources. The DRP will be guided by the "precautionary principle", where if there is a threat of irreversible harm to park resources, a lack of full scientific certainty will not delay management action (Kriebel *et al*., 2001). Additional information on the approach to visitor use management in Florida State Parks can be found in Appendix 9.

Since assuming management of the park, DRP has analyzed the current levels of visitation, the patterns of recreational use, and the variety of recreational activities available. Resource impacts from recreational use at the park also were observed and documented. The DRP has determined that most of the recreational activities at the park are sustainable; however certain recreational activities will be discontinued or limited to certain areas. Changes to some recreational patterns have already occurred, including reducing the size of the camping areas that existed when the park was in private ownership and discontinuing swimming in Little Blue and Johnson springs.

Achieving a balance between resource protection and public access is a particularly difficult task when considering long-term recreational use of Gilchrist Blue Spring and spring run. Regional demand for groundwater and nitrate pollution is affecting the quality of the park's namesake spring ecosystem. The effects of these impacts, such as an increase in the presence of harmful algal growth, can be amplified by recreational use.

To conserve the spring and spring-run for the perpetual enjoyment of park visitors, two site-specific spring recreation zones are identified for Gilchrist Blue Spring and spring-run (See Spring Recreation Zones Map). Swimming, snorkeling, and wading will be limited to the designated swimming area located within Gilchrist Blue Spring Zone A (the headspring). Paddling will be the only

activity permitted within Zone B (the spring-run). Specific resource indicators, resource thresholds and management strategies designed to reduce or mitigate recreational impacts were identified for each zone and for all proposed recreational activities.

Resource Indicators and Thresholds

This plan includes site-specific indicators and thresholds selected to monitor resource conditions and the visitor experience. By monitoring conditions over time and clearly documenting when conditions become problematic, park management can implement programs to prevent unacceptable resource conditions.

Many potential resource indicators were identified and evaluated, but those described in this section were considered the most significant given the vulnerability of the resource or visitor experience. The primary resource indicators (not in priority order) for Gilchrist Blue Springs are associated with the following issues:

- Sedimentation within the spring pool and spring run stream and erosion of the slopes of the spring bowl.

- Trenching caused by human foot-traffic within the spring pool and spring-run stream.

- Displacement, trampling and destruction of submerged aquatic vegetation caused by human foot-traffic within the spring pool and spring-run stream.

- Decreased water clarity within the spring pool and spring-run stream because of recreational activity.

- Wildlife harassment in recreation areas.

- Vegetation and soil impacts within campsites and vegetated buffers.

- Erosion and impact to vegetation along trails.

- Excessive trash or pet waste accumulating along trails or in undeveloped areas

- Damage to sensitive park resources.

GILCHRIST BLUE SPRINGS
STATE PARK

N

0 50 100 200 Feet

Florida Department of Environmental Protection
Division of Recreation and Parks
Date of aerial; 2019

SPRING RECREATION
MANAGEMENT ZONES*

** Boundaries are approximate*

Thresholds are defined as the minimally acceptable conditions for each indicator and represent the point at which resource impacts will require a change in management strategy or actions to improve resource conditions. Thresholds are assigned based on the desired resource conditions, the data on existing conditions, relevant research studies, management experience, and current visitor use patterns. It is important to note that identified thresholds still represent acceptable resource conditions and not degraded or impaired conditions. Management actions may also be taken prior to reaching the thresholds. The indicators, thresholds and proposed management strategies that will be implemented for Gilchrist Blue Springs State Park are presented in Table 8.

Table 8. Gilchrist Blue Springs State Park Visitor Use Management Indicators, Thresholds and Management Strategies.

Activity(s)	Indicator(s)	Threshold(s)	Management Strategies
Sunbathing Picnicking	Increased sedimentation around the perimeter of the main headspring or within the main headspring. Presence of bare soil and exposed roots on slopes above spring.	Any increase in sediment around the perimeter or bowl of the main spring.	•Implement slope stabilization and erosion control. •Restore eroded shoreline. •Designate access routes to primary facilities. •Install surface matting (or other pervious paving) along primary access routes. •Relocate picnic area.
Zone A Swimming Snorkeling Wading	Percent reduction in native Submerged Aquatic Vegetation (SAV) coverage in Zone A.	Coverage of native SAV is less than 10% of submerged areas.	•Close areas of spring to promote native SAV recovery. •Restore native SAV in closed areas. •Add/improve signage to regulate visitor behavior. •Educate visitors on the effect of recreation in spring ecosystems. •Establish visitor use limits from May 1 - October 1 in Zone A.

Table 8. Gilchrist Blue Springs State Park Visitor Use Management Indicators, Thresholds and Management Strategies.			
Activity(s)	**Indicator(s)**	**Threshold(s)**	**Management Strategies**
	Presence of unauthorized shoreline trails or shoreline erosion.	Any evidence of unauthorized shoreline trails or shoreline erosion.	•Designate access points and swimming area. •Educate visitors about shoreline and erosion impacts. •Add/improve signage to regulate visitor behavior. •Brush in unauthorized trails. •Close and restore areas of eroded shoreline.
Zone B Paddling	Percent reduction in native SAV coverage in Zone B.	Coverage of native SAV is less than 70% of submerged areas.	•Close areas of spring to promote native SAV recovery. •Restore native SAV in closed areas.
	Increased turbidity (decrease in water clarity) due to recreational use during peak season (May 1 – October 1).	Increased turbidity (decrease in water clarity) is greater than 50% above baseline condition for more than 2 hours on any day during peak season.	•Add/improve signage to regulate visitor behavior. •Educate visitors on the effect of recreation in spring ecosystems. •Establish visitor use limits from May 1 - October 1 in Zone A.
	Increase in bare soil/sand, scarring or trenching within the spring-run stream.	Any direct observation of an increase in the amount of bare soil/sand, erosional trenching, or scarring on spring and spring-run bottom as documented by monitoring.	•Initiate regular paddle patrols in Zone B. •Add/improve signage to regulate visitor behavior •Close Zone B to paddling.

Table 8. Gilchrist Blue Springs State Park Visitor Use Management Indicators, Thresholds and Management Strategies.			
Activity(s)	**Indicator(s)**	**Threshold(s)**	**Management Strategies**
	Amount of wildlife disturbance/harassment (e.g., turtles, manatees).	Any increase in monthly incidents of wildlife disturbance or harassment as documented during monitoring.	•Educate visitors about recreational impacts to wildlife.
	Presence of unauthorized shoreline trails or shoreline erosion or evidence of trampled or damaged shoreline vegetation, human waste, or trash.	Any evidence of unauthorized shoreline trails or other shoreline erosion.	•Close and restore unauthorized trails. •Close and restore areas of shoreline erosion or vegetation damage. •Educate visitors about shoreline and erosion impacts. •Add/improve signage to regulate visitor behavior. •Close Zone B to paddling
Hiking	Number of unauthorized trails or footpaths.	Any evidence of new unauthorized trails or footpaths.	•Close and restore unauthorized footpaths and trails. •Improve marking of existing trails. •Reroute existing trails as necessary. •Educate users on “leave no trace” principles and park regulations. •Close trail.
	Percent increase in erosion or vegetation trampling on existing trails.	Increased trail width/depth of existing trail expands to greater than 25% over baseline condition as documented during monitoring.	•Develop a trail maintenance plan. •Add/improve signage to regulate visitor behavior. •Reroute existing trails as necessary. •Close trail when flooded.

Table 8. Gilchrist Blue Springs State Park Visitor Use Management Indicators, Thresholds and Management Strategies.			
Activity(s)	**Indicator(s)**	**Threshold(s)**	**Management Strategies**
	Percent increase in trash, pet waste or resource damage.	Increase in trash or pet waste or resource damage as documented during routine monitoring.	•Educate users on "leave no trace" principles and park regulations. •Close resource sensitive areas with fence and interpretation •Close trail.
Camping	Percent increase in exposed mineral soil or exposed roots within campsite.	Exposed mineral soils or tree roots is greater than 50% of site as documented during monitoring.	•Stabilize campsites with appropriate materials. •Close campsites
	Percent increase in trampled vegetation, or damaged trees adjacent to campsite.	Increase in damaged vegetation within campsites or within vegetated buffers as documented during monitoring.	•Close sensitive areas of a campsite or buffer to allow for resource recovery. •Educate visitors on "leave no trace" principles and park regulations.
	Percent satisfaction with camping experience based on user surveys.	Achieve at least an 80% year-round satisfaction	•Educate visitors on park regulations and user group etiquette. •Implement improvements based on visitor feedback.

The current picnic area is located on the slopes of the spring bowl. The picnic and swimming areas receive the largest volume of use throughout the year. Visitors regularly traverse up, down and across the steep slopes. Over time, this heavy foot traffic has severely impacted the area and causes rapid soil erosion. Groundcover vegetation is now nearly absent and exposed tree roots are common. To redress these recreational impacts, relocation of the main picnic area, and restoration and stabilization of the slope are a management priority. Monitoring sediment accumulation within the main spring will assist in evaluating the success of these restoration efforts and alert park staff when the level of visitor use within the spring bowl begins to compromise the quality of the headspring.

Swimming, wading and snorkeling within the main spring and spring-run stream are the park's most popular activities. Unfortunately, human foot traffic

during peak periods of recreational use causes damage to the submerged aquatic vegetation within the spring and spring-run stream, and a wide and deep erosional trench has developed in the soils along the center of the entire spring-run. Unfortunately, this trenching and the loss of SAV only encourages further damage as visitors begin to utilize the expanding area of bare soils, leading to the eventual loss of yet more SAV.

The spring and spring-run stream can also experience high turbidity levels during peak periods of recreational use. This turbidity is most often caused by human foot traffic and the associated uprooting of SAV. This increase in turbidity, coupled with increased periphyton growth, has a harmful effect on the amount of SAV. Monitoring the presence of SAV, the depth and width of soil trenching and the turbidity levels within the spring-run stream will provide the necessary data to assess the extent of recreational impact and will be used to inform decisions regarding resource restoration and potential changes to visitor use patterns.

The spring and spring-run stream provide important habitat for freshwater fish and turtle species and even the occasional manatee. It is in the interest of species conservation that any incidents of wildlife harassment are recorded and monitored, particularly during the busy summer season. Inappropriate behavior toward wildlife by park visitors will not be tolerated. Educational signage and clear posting of park regulations will be the primary management strategy to regulate visitor behavior; however, closure of use areas and the use of law enforcement will also be considered if necessary.

The park's proposed trail network will provide access to the more isolated areas of the park increasing the likelihood that visitors will encounter sensitive park resources such as archaeological sites or geological features. The park's limestone outcrops and the edges of sinkholes and sinkhole lakes must be protected from disturbance, particularly from human foot traffic. The park will need to prevent runoff and erosion from degrading the park's sensitive karst features located along or near hiking trails. Cultural resources are nonrenewable and any damage to cultural sites must be minimized. Park staff will regularly monitor cultural resources and documented any changes in a site's condition. Educating visitors on "leave no trace" principles, providing well-marked and maintained trails, and quality educational signage will be the management priority. Trails may be closed or rerouted as necessary. Portions of the park may also be closed to visitors if resource damage becomes a regular occurrence.

The camping experience can be impacted by overcrowding or poorly maintained campground facilities. Regularly trampled or damaged vegetation and soil erosion can indicate heavy campsite usage. Individual campsites will be regularly monitored for potential resource impacts or damage to infrastructure. Campsites will be repaired and stabilized as needed. Noisy campers, poorly maintained facilities, trash and pet waste can also contribute to a poor camping experience and resource impacts. DRP receives direct feedback on these issues

from individual campers via an online survey. This feedback will be monitored, and issues will be addressed as necessary to maintain a quality visitor experience and minimize resource impacts. Campsites may be closed or relocated and the types of camping available may be adjusted.

Monitoring

Resource monitoring is a routine part of park management and has occurred at Gilchrist Blue Springs since it opened as a state park. Monitoring the condition of campsites and trails is frequent and occurs at least weekly. Resource conditions within the spring and spring-run are also monitored with regularity by district and park staff.

At minimum, and to establish the necessary trend data for a complete analysis of potential recreational impacts, monitoring conditions within the spring and spring-run stream will occur near the beginning (April 1) and end (Oct. 1) of the peak use season (April – October). Monitoring will typically occur with greater frequency throughout the peak visitor use season and continue throughout the year. Final monitoring protocols will be established within two years of the final approval of this park management plan. Greater detail concerning spring monitoring can be found in the Resource Management Component.

Initial monitoring will determine if the selected indicators are accurately measuring resource impacts and if the established thresholds are adequate to maintain the desired resource conditions. Revisions to the indicators and standards identified in this plan may be necessary during the first few years of monitoring. Additionally, if visitor use levels or visitor use patterns increase or change dramatically, new indicators and standards may need to be added.

Application of Management Strategies

This visitor use management strategy is based on adaptive management framework, an iterative process in which management decisions are continuously informed and improved. Resource indicators are monitored, management strategies are implemented, and adjustments are made as appropriate. To determine the order and timing for the application of the proposed management strategies, DRP will analyze the issues and potential impacts in proportion to their significance and impact. Some management strategies, such as educational signage, can be implemented quickly based on current data and visible resource impacts. More complex management strategies, such as visitor use limits will be considered for implementation as resource conditions are monitored and documented.

A level of uncertainty and risk will always be associated with the issues concerning visitor use management. In certain situations, where there is an imminent risk or threat to irreplaceable resources, DRP will rely on professional judgement and the best available data. All decisions regarding visitor use will be addressed with a well-documented analysis and administrative record that

supports the decision. Information on monitoring efforts, related visitor-use management actions and any proposed changes to the identified indicators and standards will be shared with the public.

Visitor Programs

Objective: Provide and develop public access through interpretive, educational and recreational programs on a regular basis.

Action 1 Develop interpretive programming for the public on anthropogenic impacts to the Gilchrist Blue springshed and recreation impacts to the park's spring ecosystems.

The interpretive and recreational programming at Gilchrist Blue Spring State Park will promote resource stewardship and greater understanding of Florida's freshwater spring ecosystems. A key priority will be the development of the interpretive programming and signage needed to inform park visitors on the recreational impacts of swimming and wading within the main headspring and spring-run. This critical signage will serve as a catalyst to learning and encourage visitors to moderate their own behavior to avoid negative impacts to the park's resources. Interpretive signage on "Leave no Trace" principles, trail erosion and respect for wildlife will also be needed along the park trails, within the campground and day use area.

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 to be maintained until new construction or renovation, as discussed further below, can be funded 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 objectives are identified to implement the conceptual land use plan for Gilchrist Blue Springs:

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: Construct and improve park facilities, 4.5 miles of trail and 1.25 mile of road.

Major construction and 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). The following discussion of other recommended improvements and repairs are organized by use area within the park.

Most of the current facilities are not universally accessible. A significant investment will be required to redesign the main day use area and replace critical facilities, like the bathhouse, to provide universal accessibility. As new facilities like the proposed campground are funded, they will be built to current accessibility standards. The concept of universal design will be incorporated into all capital projects as the park is redeveloped.

Main Day Use Area

Gilchrist Blue Springs was a private recreation site for many years. Many of the current facilities while adequate may need to be removed, renovated or replaced. Changes to the park will be initiated to ensure long-term conservation of the park's natural resources and complete the transition from private facility to state park. All current facilities and recreational amenities are being evaluated for their compatibility with the park's resources, and their overall safety and accessibility.

DRP has determined that a complete redesign of the current day use area would provide greater protection of the main spring and Spring-run. Day use facilities, such as picnic shelters, will move uphill and off the slopes of the main spring bowl. An immediate priority is the landscape restoration and slope stabilization needed to reduce soil sedimentation and erosion into Gilchrist Blue Spring. This restoration work will largely be designed for aesthetics but will be based on the site's natural ecology and utilize native plant material. Water bars and other slope stabilization techniques will be utilized. A goal of this restoration effort will be the removal of the wooden retaining wall around the main spring and the eventual restoration of the natural shoreline. Designated access routes to the main spring, bathhouse and paddling launch will be incorporated into the redesign to improve pedestrian circulation, universal accessibility, and minimize further erosion.

The redesign will clearly define a canoe/kayak launching area and a convenient location for boat storage. The current canoe launching area is small and becomes crowded with paddlers and swimmers on busy days. The redesign will determine the best location for this new facility and will include the installation of a floating canoe and kayak launch to provide greater shoreline protection and accessibility.

Gilchrist Blue Springs once had a wonderful boardwalk that provided excellent views of the Spring-run. Unfortunately, the boardwalk was destroyed by flooding associated with Hurricane Irma. A new boardwalk will be included as part of the proposed redesign. The new boardwalk will be carefully developed within the floodplain near the Spring-run and provide overlooks of the floodplain

and spring-run stream. The terminus of the boardwalk will provide visitors an opportunity to experience the dramatic confluence of the main spring-run and Santa Fe River and the excellent views of the Santa Fe River corridor.

Another focus of the redesign will be to rearrange the existing parking area and the large open space at the top of the slope adjacent to main headspring. This will include creating a new stabilized parking area, new picnic area, and improved landscaping and stormwater retention. The placement of all new facilities will be carefully considered to avoid any additional impacts to the park outside of the existing disturbed area. The redesign will include the construction of a new concession, picnic pavilions and a bathhouse. The existing modular support buildings will be removed to open more area for picnicking and sunbathing and new support buildings constructed in an area just to the west of the current parking area.

Trail Development

An interpretive hiking trail has been preliminarily established, at the edge of the floodplain just to the east of the existing day use area. This trail will be further developed and include informational signage on the interesting karst features and plant communities that can be identified in this portion of the park. Additional trails are planned for longer hikes and will allow visitors to experience the park's ecological diversity. These trails will be developed over time. All trails developed in the park will be designated for hiking only.

Camping Area

As a private attraction, the park had a large area dedicated to camping. The area available for campsites was reduced, however, at least eighteen existing campsites were powered and still serve as the park's current campground along with an additional seven non-powered sites used primarily by tent campers. This temporary campground will remain until a new family campground is developed in the same vicinity. The future campground will consist of a traditional 30-site campground loop and an additional 10 tent-only sites. Tent-only sites will be walk-up sites served by centrally located parking and have centrally located potable water and power that serves more than one site. The future campground will be served by a single dedicated campground bathhouse.

New Park Entrance

The park's current entrance is located next to private residential development. On days with heavy traffic, the location and condition of the road can create dusty and noisy conditions. Traffic will also back up along CR 340 and impact adjacent property owners. A new park entrance, ranger station and park drive will be developed off CR340. The current park entrance road (NW 80th St.) will be dedicated for use as a service road and may serve as a firebreak along the eastern boundary of the park to enhance fire management and restoration of the park's remnant sandhill. The new park entrance, ranger station and park

drive will be developed in concert with sandhill restoration objectives and utilize existing disturbed areas where possible. A new temporary ranger station will be sited near the current flagpole and gate and will be incorporated into the redesign of the main day use area.

Support Facilities

Gilchrist Blue Springs is a well-visited park that needs new support facilities. Park staff currently operate out of mobile trailers. On-site residences will provide for security and efficient park operations. One new residence is currently funded and will soon be under construction, and a total of two staff residences, 2-bay shop, and equipment shelter are planned. The existing support buildings and residences will be removed. New support facilities will be placed in a wooded area to the west of the existing facilities as part of the redesign of the day use area.

Facilities Development

Preliminary cost estimates for these recommended facilities and improvements are provided in the Ten-Year Implementation Schedule and Cost Estimates (Table 7) located in the Implementation Component of this plan. These cost estimates are based on the most cost-effective construction standards available at this time. The 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:

Main Day Use Area
Redesign and Relocate Day Use Area
Landscaping and Erosion Control (Spring Bowl)
New Boardwalk
New Canoe/Kayak Launch
New Parking Area (Stabilized Unpaved)
Concession Building
Picnic Pavilions (2 large, 4 medium)
Bathhouse

Camping Area
New 40-Site Family Campground (30 traditional campsites, 10 tent-only sites, bathhouse)

Support Facilities
2 Bay Shop
Staff Residence (2)
Wastewater Treatment Plant

Parkwide
Hiking Trails
New Park Entrance/Ranger Station
New Park Drive

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

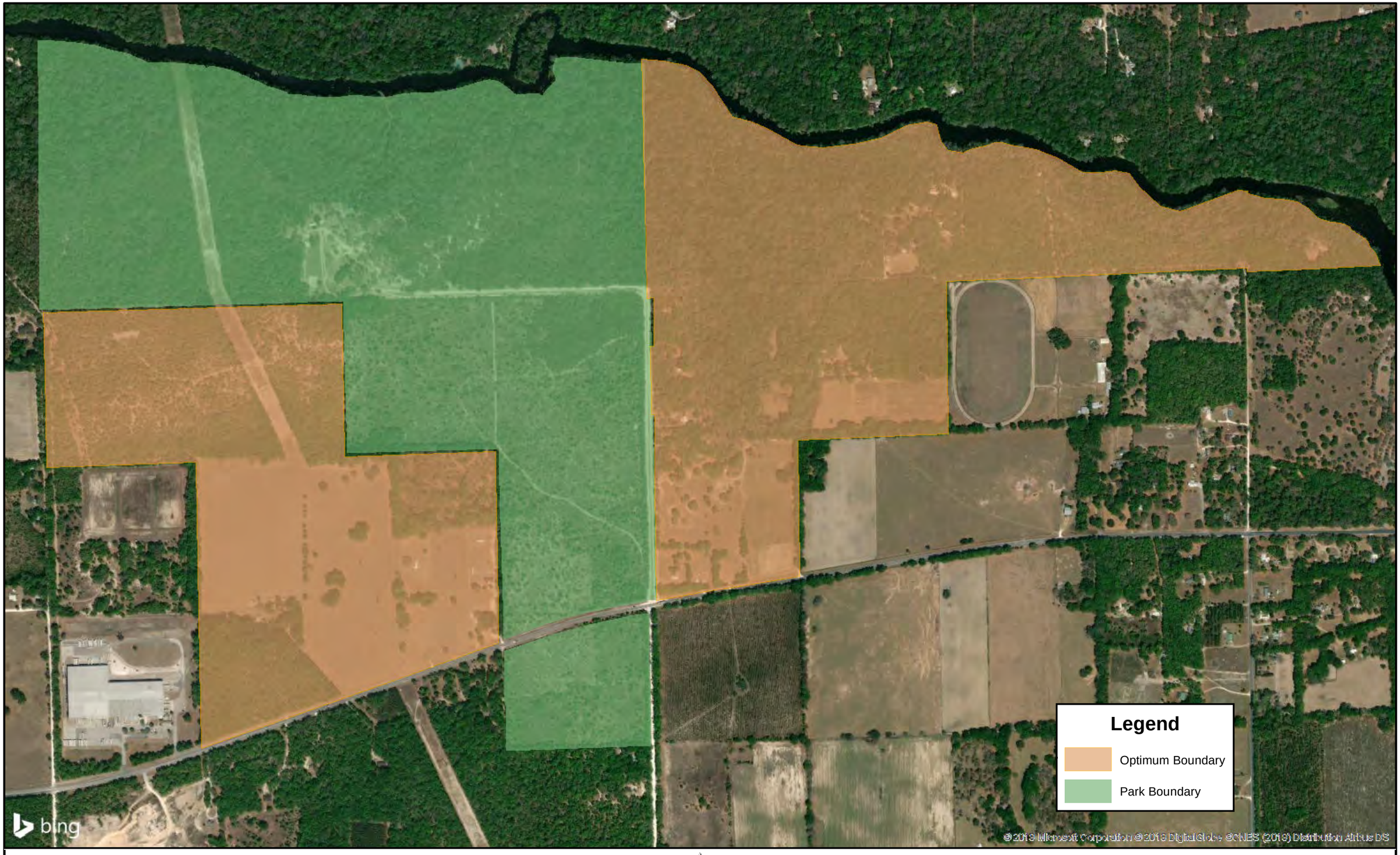
the park, provide additional natural and cultural resource protection or allow for future expansion of recreational activities. Parklands that are potentially surplus to the management needs of DRP are also identified. As additional needs are identified through park use, development, and research, and as land use changes on adjacent property, modification of the park's optimum boundary may be necessary (see Optimum Boundary Map).

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.

Parcels that lie to the east of the park have been included to enhance protection the Santa Fe River floodplain, two additional named springs, and to provide a greenway connection between Gilchrist Blue Springs and Poe Springs County Park (Alachua County).

Additional parcels along the park's eastern boundary that are under single ownership have also been included. Digital elevation models indicated that the largest of these parcels contains an extensive area of floodplain and potential karst features. These parcels as well as additional property identify to the park's southwest would buffer the park from potential future development and provide enhanced floodplain and springshed protection.

THIS PAGE INTENTIONALLY LEFT BLANK



RUTH B. KIRBY GILCHRIST BLUE SPRINGS STATE PARK

N

0 500 1,000 2,000 Feet

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

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. They outline the park's management needs and problems and recommend 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 Ruth B. Kirby Gilchrist Blue Springs State Park officially open in 2017, significant work has been accomplished and progress made towards meeting the DRP's management objectives for the park. These include:

Park Administration and Operations

- Between 2017 and 2019, over 687 volunteer hours have been donated to Ruth B. Kirby Gilchrist Blue Spring State Park.
- Park and District 2 staffs reorganized and improved campground layout.
- To promote the park to the public, increase visitation and revenue, the park has sponsored the following special events:
    - First Day Hikes in 2018 and 2019
    - Springs Clean-up Volunteer Workday
    - Gilchrist Blue Springs Junior Ranger Day

Resource Management

Natural Resources

- The park has increased the annual burn acreage goal to 224.1 acres for FY19/20.
- Over the past two years park staff and Volunteers have trapped and removed 58 feral hogs over the past two years. It is a high priority to eradicate these destructive animals from the park, as was previously done in the 1980s.

- Park completed vegetation restoration and soil stabilization at the spring bowl. Also, have worked with District Biologist to improve submerged aquatic vegetation (SAV) in the spring runs.
- Since 2017, park and District 2 staffs have cooperated with the Alachua County Environmental Protection Department and Karst Environmental Services in annual monitoring of submerged aquatic vegetation (SAV) in Gilchrist Blue and Naked springs.
- District 2 staff have developed monitoring protocols for semi-annual SAV surveys at Gilchrist Blue and Naked springs.
- District 2 staff have conducted multiple biological surveys to characterize the property's natural resources, producing natural community maps and plant and animal species lists.
- Park and District 2 staffs have cooperated with the Suwannee River Water Management District in establishing a new continuous data collection monitoring station at Gilchrist Blue Springs to record water quality parameters such as nitrates, turbidity, conductivity and oxygen.
- Park and District 2 staffs are working with the Florida Department of Environmental Protection and SRWMD in applying for grants for springs restoration.
- Park and District 2 staffs are continuing to coordinate with professional cave divers in mapping aquatic cave conduits within the Gilchrist Blue and Ginnie springsheds.
- Park staff are continuing to cooperate with Florida Fish and Wildlife Conservation Commission Law Enforcement professionals to ensure that park rules and laws are enforced.

Cultural Resources

- Established a protocol for regularly monitoring the park's two known archaeological sites and for recording disturbances observed.
- Staff have monitored archaeological sites on a quarterly basis for disturbance.

Recreation and Visitor Services

- Initiated use of the weekly report of receipts, revenue tracking and visitation.
- Currently developing of new park brochures, maps, and interpretive handouts.
- Initiated Gilchrist Blue Springs Junior Ranger and Springs Outreach Program

Park Facilities

- Installed a new park entrance sign.
- Reduced number of sites in campground from 200+ to a 25-sites (18 RV and 7 tent).
- Painted existing park facility infrastructure to agency standards.
- Removed a boardwalk damaged by Hurricane Irma that extended the length of Gilchrist spring-run stream.
- Removed a jump platform located at Gilchrist Blue headspring because of its poor and unsafe condition.
- Marked and mapped existing park trails.
- Acquired FY 2019-20 funds for initial design and engineering of park facilities including campground, ranger station, parking, concession and visitor services.
- Implemented procedures for regular road maintenance and stabilization of the unpaved main park drive.

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 9) 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, a number of 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. The plan's recommended actions, time frames and cost estimates will guide the DRP's planning and budgeting 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 9 may need to be adjusted during the ten-year management planning cycle.

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	**$91,497**
Objective B	**Expand administrative support as new lands are acquired, new facilities are developed, or as other needs arise.**	Administrative support expanded	C	**$90,000**
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	**Evaluate and mitigate impacts of soil erosion in the park**			**$252,900**
Action 1	Investigate best management options for additional erosion mitigation in public access areas.	Assessment conducted	ST	$2,000
Action 2	Monitor areas prone to erosion.	Monitoring on-going	C	$900
Action 3	Implement corrective measures where needed to reduce impacts of soil erosion on water resources (e.g., around all springs).	Project completed	UFN	$250,000
Objective B	**Conduct/obtain an assessment of the park's hydrological restoration needs**			**$51,000**
Action 1	Continue to cooperate with other agencies and independent researchers regarding hydrological research and monitoring programs	Cooperation on-going	C	$4,000
Action 2	Continue monitoring of surface and ground water quality at Gilchrist Blue Springs and track changes.	Monitoring on-going	C	$2,000
Action 3	Perform dye trace studies within the Gilchrist Blue Springshed to determine the groundwater sources for the spring and karst systems in the park.	Project implemented	UFN	$40,000
Action 4	Continue to monitor land use or zoning changes around the Park.	Monitoring on-going	C	$2,000
Action 5	Continue to cooperate with the SRWMD to ensure MFLs for the Santa Fe River are monitored for compliance to maintain historic river flows.	Cooperation on-going	C	$3,000
Objective C	**Restore natural hydrological conditions and functions to approximately 2 acres of spring-run stream natural community.**			**$40,050**
Action 1	Close Naked Spring and the lower Gilchrist Blue spring-run stream and other sensitive features in the park to swimming and wading activity to allow SAV restoration. Limit swimming and wading to the currently designated swimming area within the Gilchrist Blue main spring.	Policy implemented	LT	$1,750

* 2019 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.				
Action 2	Develop and implement a plan to re-establish littoral and shoreline vegetation adjacent to the swimming area and establish designated water entry points in the swimming area.	Monitoring implemented	ST	$12,300
Action 3	Develop a plan to conduct experimental SAV plantings within Gilchrist and Naked spring-run streams.	Project implemented	UFN	$10,500
Action 4	Develop and implement monitoring protocols for semi-annual SAV assessments and continuous monitoring in Gilchrist and Naked springs and their associated spring-run streams.	Monitoring conducted	UFN	$13,000
Action 5	Develop and implement a monitoring protocol to track brownouts, turbidity and changes in water clarity of Gilchrist Blue, Little Blue, Johnson, and Naked Springs	Monitoring on-going	C	$2,500
Goal III: Restore and maintain the natural communities/habitats of the park.		**Measure**	**Planning Period**	**Estimated Manpower and Expense Cost* (10-years)**
Objective A	**Complete a comprehensive floral and faunal survey and create/update the park's baseline plant and animal list.**			**$3,000**
Action 1	Complete a comprehensive survey.	Survey completed		$1,500
Action 2	Create a baseline plant and animal list.	List completed		$1,500
Objective B	**Within 10 years, have 250 acres of the park maintained within the optimum fire return interval.**	# Acres within fire return interval target	LT	**$138,000**
Action 1	Develop/update annual burn plan.	Plan updated	C	$8,000
Action 2	Manage fire dependent communities by burning between 85 - 235 acres annually.	Average # acres burned annually	C	$115,000
Action 3	Create 1.4 miles of perimeter firebreaks	# Miles established	ST	$15,000
Objective C	**Conduct natural community/habitat improvement activities on 276 acres of sandhill natural community.**	# Acres restored or with restoration underway		**$75,500**
Action 1	Mechanically and/or chemically treat off-site hardwoods in the 32 acres abandoned field in zones GBS-4, GBS-5 and GBS-6.	Plan developed/updated	ST	$10,500
Action 2	Plant longleaf pine in zones GBS-4, GBS-5 and GBS-6 on 148 acres of sandhill and abandoned pasture after the initial site burn.	# Acres with restoration underway	LT	$25,000
Action 3	Mechanically and or chemically treat 96 acres selected hardwoods adjacent to existing longleaf pines in zones GBS-1w, GBS-1e and GBS-3.	# Acres treated	ST	$30,000
Action 4	Determine need for treatment of exotic pasture grasses and native groundcover seeding in addition to longleaf pine planting.	# Acres treated	C	$2,500

* 2019 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.				
Action 5	Promote native groundcover improvement as needed.	# Acres with restoration underway	C	$7,500
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	**Develop baseline imperiled species occurrence inventory lists for plants and animals.**	List developed	C	**$500**
Action 1	Develop baseline imperiled species occurrence inventory lists for plants and animals.			
Objective B	**Monitor and document 4 selected imperiled animal species in the park.**	# Species monitored	C	**$6,500**
Action 1	Develop monitoring protocols for 1 selected imperiled animal species, the West Indian manatee.	# Protocols developed	ST	$1,000
Action 2	Implement monitoring protocols for 4 imperiled animal species, including those listed in Action 1 above, the Suwannee alligator snapping turtle, the gopher tortoise and imperiled bird species.	# Species monitored	C	$5,500
Objective C	**Monitor and document 1 selected imperiled plant species in the park.**	# Species monitored	C	**$1,200**
Action 1	Implement monitoring protocol for 1 imperiled plant species; rain lily			
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 all infested acres of exotic plant species in the park.**	# Acres treated		**$26,500**
Action 1	Annually develop/update exotic plant management work plan.	Plan developed/updated	C	$8,000
Action 2	Implement annual work plan by treating all upland acres in park, annually, and continuing maintenance and follow-up treatments, as needed	Plan implemented	C	$17,000
Action 3	Develop a specific plan to monitor, track and eradicate non-native SAV (hydrilla and Indian swampweed) from the park's spring systems.	Plan implemented	C	$1,500
Objective B	**Implement control measures on 1 exotic animal species in the park.**	# Species for which control measures implemented		**$4,000**
Action 1	Control feral hogs on an as needed basis.		C	$4,000

* 2019 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 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 the physical condition of 1 cultural site in the park.**			**$1,500**
Action 1	Complete DRP condition assessment of site GI21.	Assessment complete	ST	$1,500
Objective B	**Compile reliable documentation for all recorded historic and archaeological sites.**			**$18,900**
Action 1	Ensure all known archaeological sites have been recorded with the FMSF. Any new sites discovered will be recorded with the FMSF.	# Sites recorded or updated	ST	$1,500
Action 2	Complete an archaeological sensitivity model for the park.	Probability Map completed	ST	$3,000
Action 3	Conduct a Phase 1 survey in advance of any ground disturbance.	Document completed	ST	$7,400
Action 4	Develop a protocol to address archaeological artifacts found in the park.	Protocol implemented	LT	$0
Action 5	Develop and adopt a Scope of Collections Statement that indicates the park will not maintain a collection.	Report completed	ST	$3,500
Action 6	Conduct oral history interviews with the park's previous owners.	Interviews completed	LT	$3,500
Objective C	**Bring 1 of 2 recorded cultural resources into good condition**			**$2,500**
Action 1	Develop a protection and treatment plan for site GI21.	# Sites monitored	C	$2,500
Goal VII: Provide public access and recreational opportunities in the park.		**Measure**	**Planning Period**	**Estimated Manpower and Expense Cost* (10-years)**
Objective A	**Provide and develop public access through appropriate resource-based recreational activities.**	# Recreation/visitor opportunities per day	C	**$182,995**
Objective B	**Provide and develop public access through interpretive, educational and recreational programs on a regular basis.**		ST	**$150,000**
Action 1	Develop outreach programs and educational ignage for the public on anthropogenic impacts to the Gilchrist Blue Springshed and recreation impacts to the park's spring systems.		ST	$150,000

* 2019 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 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	**$213,494**
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	**$150,000**
Objective C	**Construct and improve park facilities, 4.5 miles of trail and 1.25 miles of road.**	# Facilities/Miles of Trail/Miles of Road	LT/UFN	**$7,200,000**
Objective E	**Expand maintenance activities as existing facilities are improved and new facilities are developed.**	Facilities maintained	C	**$200,000**

Summary of Estimated Costs

Management Categories		Total Estimated Manpower and Expense Cost* (10-years)
Resource Management		**$563,100**
Administration and Support		**$181,497**
Capital Improvements		**$7,350,000**
Recreation Visitor Services		**$746,489**
Law Enforcement Activities	Note: Law enforcement activities in Florida State Parks are conducted by the FWC Division of Law Enforcement and by local law enforcement agencies.	

* 2019 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

THIS PAGE INTENTIONALLY LEFT BLANK

Appendix 1—Acquisition History

LAND ACQUISITION HISTORY REPORT

Park Name	Ruth B. Kirby Gilchrist Blue Springs State Park
Date Updated	4/11/2019
County	Gilchrist County, Florida
Trustees Lease Number	Trustees Lease No. 4814
Current Park Size	402.42 acres
Purpose of Acquisition	The Board of Trustees of the Internal Improvement Trust Fund of the State of Florida has acquired Gilchrist Blue Springs State Park to preserve the lands around the springs in the area to aid protecting the springs, Karst windows, and Floridan aquifer from the effects of commercial, residential, and agricultural run off; clearcutting and minig; and unsupervised recreation to ensure the Floridians and visitors to enjoy Florida Springs for years to come.

Acquisition History (Includes acquisition of a parcel or parcels with ten [10] or more acres)

Parcel Name or Parcel DM-ID	Date Acquired	Initial Seller	Initial Purchaser	Size in acres	Instrument Type
DMID378157	10/6/2017	Blue Springs Properties, Inc.	Board of Trustees of the internal Improvement Trust Fund of the State of Florida	402.42	Warranty Deed

Management Lease

Parcel Name or Lease Number	Date Leased	Initial Lessor	Initial Lessee	Current Term	Expiration Date
Lease No. 4814	1/3/2018	The Board of Trustees of the Internal Improvement Trust Fund of the State of Florida	The State of Florida Department of Environmental Protection, Division of Recreation and Parks	Fifty(50) years	1/2/2068

Outstanding Issue	Type of Instrument	Brief Description of the Outstanding Issue	Term of the Outstanding Issue
There are no known deed-related outstanding issues such as reservations or restrictions related to public park or recreational use of any part of or whole portion of Gilchrist Blue Springs State Park.			

THIS PAGE INTENTIONALLY LEFT BLANK

Appendix 2—Advisory Group Members and Report

Local Government Representatives

The Honorable Todd Gray,
Chair, Gilchrist County Board of County Commissioners

The Honorable Nancy Lanvin,
Commissioner, City of High Springs Commission

Agency Representatives

Gabby Paxton, Park Manager
Gilchrist Blue Springs State Park
Division of Recreation and Parks

Brett Crawford, Chair
Gilchrist County Soil and Water Conservation District

Doug Longshore,
Other Public Lands Forester
Florida Forest Service

Matthew Pollock, Regional Biologist
Florida Fish and Wildlife Conservation Commission

Fay Baird, Senior Hydrologist
Suwannee River Water Management District

William McKinstry,
Land and Facilities Operations Manager
Suwannee River Water Management District

Jason O'Donoughue, Archaeologist
Florida Department of State
Division of Historical Resources

Charlie Houder, Director
Alachua County Parks & Recreation

Environmental/Conservation Group Representatives

Georgia Schemitz,
Four Rivers Audubon Society

Jenny Welch, President
Sparkleberry Chapter
Florida Native Plant Society

Jim Tatum,
Suwanee St. Johns Sierra Club

Michael Roth, President
Save Our Santa Fe River

Robert Knight, Ph.D.
Howard T. Odum
Florida Springs Institute

Recreational User Group Representatives

Mitch Sapp, President
Sandhill Chapter
Florida Trail Association

Tourism and Economic Development Representatives

Donna Creamer, Director
Gilchrist County Visitors and Convention Bureau

Thomas Weller, President
High Springs Chamber of Commerce

Local Private Property Owners

Kim Davis, Local Resident
Property Owner

Merillee Malwitz-Jipson, Local Resident
Property Owner

Peter Butt, Local Resident
Property Owner

Report

Appendix 3—References Cited

Alder, J. M., S. C. Barry, G. R. Johnston, C. A. Jacoby, T. K. Frazer 2018. An aggregation of Florida turtles in a spring yields insight into effects of grazing on vegetation. Freshwater Science Volume 37, Number 2. 397-403 pp.

Aley, T. 1999. Groundwater tracing handbook. Ozark Underground Laboratory, Protem, Missouri. 35 pp.

Anastasiou C. 2006. An investigation of the special and temporal trends in water clarity: Rainbow River, Florida. Report by Florida Department of Environmental Protection, Tallahassee, Florida. 63 pp.

Bureau of Economic and Business Research (BEBR), Florida Estimates of Population 2018, University of Florida. 2018.

Berndt, M., E. Oaksford, M. Darst, and R. Marella 1996. Environmental setting and factors that affect water quality in the Georgia–Florida Coastal Plain Study Unit. United States Geological Survey Water Resources Investigations Report 95-4268. 45 pp.

Berndt M. P., H. H. Hatzell, C. A. Crandall, M. Tutora, J. R. Pittman, E. T. Oaksford 1998. Water quality in the Georgia-Florida coastal plain, Georgia, and Florida, 1992-96: A contribution of the National Water Quality Assessment (NAWQA) Program. United States Geological Survey Circular 1151. United States Geological Survey, Denver, Colorado. 34p p.

Brown, M., K. Reiss, M. Cohen, J. Evans, P. Inglett, K. Inglett, K. Reddy, T. Frazer, C. Jacoby, E. Phlips, R. Knight, and S. Notestein 2008. Summary and synthesis of available literature on the effects of nutrients on spring organisms and systems. University of Florida Water Institute, Gainesville, Florida. 376pp.

Butt, P. L., and G. J. Murphy 2003. Dyal and Black Sinks dye trace Columbia County, Florida May-September 2003. Florida Department of Environmental Protection Tallahassee, Florida. 47pp. + Appendices.

Butt, P. L. 2005. Dye trace: Potential infrastructure impact to Ichetucknee Springs State Park. Florida Department of Environmental Protection. Tallahassee, Florida. 23pp.

Butt, P., S. Boyes and T. Morris 2006. Mill Creek and Lee Sinks dye trace Alachua County, Florida July-December 2005. Alachua County Environmental Protection Department. Gainesville, Florida. 171pp.

Canfield, D. and M. Hoyer 1988. Influence of nutrient enrichment and light availability on the abundance of aquatic macrophytes in Florida streams. Canadian Journal of Fisheries and Aquatic Sciences, Volume 45, Number 8. 1467-1472 pp.

Champion K. M and S. B. Upchurch 2003. Delineation of spring-water source areas in the Ichetucknee Springshed. Department of Environmental Protection, Division of State Lands. Tallahassee, Florida. 41pp.

Clark, W., R. Musgrove, C. Menke, and J. Cagle, Jr. 1964. Water resources of Alachua, Bradford, Clay, and Union Counties, Florida, Florida Geological Survey Report of Investigations Number 35. 170 pp.

Cohen, M. J., S. Lamsal, and L. V. Korhnak 2007. Sources, Transport and Transformations of Nitrate-N in the Florida Environment. St. Johns River Water Management District SJ2007-SP10. 125 pp

Col, N., F. Rupert, and G. Horvath 1997. Reappraisal of the Geology and Hydrogeology of Gilchrist County, Florida, with Emphasis on the Waccasassa Flats. Florida Geological Survey, Report of Investigations No. 99, 76 pp.

Copeland, R. 2003. Florida spring classification system and spring glossary. Florida Geological Survey, Special Publication Number 52, Florida Department of Environmental Protection, Tallahassee, Florida. 17 pp. (http://www.dep.state.fl.us/geology/geologictopics/springs/sp_52.pdf)

Copeland, R. N. Duran, A. White, and S. Upchurch 2011. Regional and statewide trends in Florida spring and well groundwater quality (1991-2003). Bulletin number 69 (revised). Florida Geological Survey, Florida Department of Environmental Protection, Tallahassee, Florida. 417 pp.

Diehl, T. H. 2000. Shoals and valley plugs in the Hatchie River Watershed. United States Geological Survey Water Resources Investigations Report, Number 00-4279. 8 pp.

Fernald E. A., and E. D. Purdum 1998. Water Resources Atlas of Florida. Florida State University, Institute of Science and Public Affairs. Tallahassee, Florida. 312 pp.

Florida Department of Environmental Protection (FDEP) 2014. Big Bend Seagrasses Aquatic Preserve Management Plan. Florida Department Environmental Protection, Florida Coastal Office, Tallahassee, Florida. 212 pp.

FDEP 2018. Florida Department Environmental Protection STORET database: Web-based water quality data. Accessed website January 2018 at URL http://storet.dep.state.fl.us/DearSpa/public/welcome

Florida Department of Transportation (FDOT) 2016. I-75 Relief Task Force Recommendations Report.

FDOT. “Florida M-CORES.” FDOT, 2019 https://floridamcores.com

Florida Exotic Pest Plant Council (FLEPPC) 2017. List of invasive plant species. Florida Exotic Pest Plant Council. Accessed website on 13 December 2017 at URL http://www.fleppc.org/list/list.htm.

Florida Fish and Wildlife Conservation Commission (FWC) 2016. Florida’s Imperiled Species Management Plan. Tallahassee, Florida. 166 pp.

Garza, R., and T. Mirti 2003. Implementation of a river-level forecast site in the Suwannee River Basin, Florida. Proceedings of the 2003 Georgia Water Resources Conference, University of Georgia, Athens, Georgia 5 pp.

Gulley, J., J. B. Martin, E. J. Screaton, and P. J. Moore 2011. River reversals into karst springs; a model for cave enlargement in eogenetic karst aquifers. Geological Society of America Bulletin (March 2011), Volume 123, Numbers 3-4, Pp. 457-467.

Grubbs, J. W. and C. A. Crandall 2007. Exchanges of Water between the Upper Floridan Aquifer and the Lower Suwannee and Lower Santa Fe Rivers, Florida. U.S. Geological Survey. Professional Paper 1656-C. 83 pp.

Ham, L. K., and H. H. Hatzell 1996. Analysis of Nutrients in the Surface Waters of the Georgia-Florida Coastal Plain Study Unit, 1970-91: U.S. Geological Survey Water-Resources Investigations Report 96-4037. 67pp.

Hand, J., J. Col and L. Lord 1996. 1996 Water quality assessment for the State of Florida. technical appendix Northeast Florida. Bureau of Surface Water Management, Florida Department of Environmental Protection, 95 pp.

Harrington, D., G. Maddox and R. Hicks 2010. Florida Springs Initiative monitoring network and recognized sources of nitrate. Florida Department of Environmental Protection, Tallahassee, Florida. 114 pp.

Hauxwell, J., T. K. Frazer and C. Osenberg 2004. Grazing by manatees excludes new and established wild celery transplants: Implications for restoration in

Kings Bay, Florida, USA. Journal of Aquatic Plant Management Volume 42. 49-53 pp.

Heffernan, J. B., M. J. Cohen, T. K. Frazer, R. G. Thomas, T. J. Rayfield, J. Gulley, J. B. Martin, J. J. Delfino, and W. D. Graham. 2010. Hydrologic and biotic influences on nitrate removal in a subtropical spring-fed river. Limnology and Oceanography Volume 55. 249–263 pp.

Heffernan, J. B., D. M. Liebowitz, T. K. Frazer, J. M. Evans, and M. J. Cohen 2010. Algal blooms and the nitrogen enrichment hypothesis in Florida springs: evidence, alternatives and adaptive management. Ecological Applications Volume 23, Number 1. 249–263 pp.

Hendryx, G. S. 2003. An intensive cultural resource assessment survey of proposed impacts at Rum Island, Columbia County, Florida. For Suwannee River Water Management District. ESI Report of Investigations No. 363. 29 pp.

Hensley, R. T., and M. J. Cohen 2017. Flow reversals as a driver of ecosystem transition in Florida springs. Freshwater Science. Volume 36, Number 1. 14-25 pp.

Hirth, D. K. 1995. Hydrogeochemical characterization of the Ichetucknee River groundwater basin using multiple tracers and computer modeling near Lake City, Florida. University of Florida, MS Thesis. 116 pp.

Hisert, R.A. 1994. A multiple tracer approach to determine the ground and surface water relationships in the western Santa Fe River, Columbia County, Florida [Ph.D. thesis]: Gainesville, University of Florida. 212 pp.

Hornsby, D. and R. Ceryak 1998. Springs of the Suwannee River Basin in Florida. Suwannee River Water Management District Report WR99-02. 178pp.

Hornsby, D., R. Mattson, and T. Mirti 2000. Surface water quality and biological annual report. Suwannee River Water Management District, Live Oak, Florida. 153 pp.

Johnston, G. R., J. C. Mitchell, E. Suarez, T. Morris, G. A. Schemitz, P. L. Butt and R. L. Knight 2016. Santa Fe River in northern Florida: Effects of habitat heterogeneity on turtle populations. Bulletin of the Florida Museum of Natural History, Volume 54, number 5 69-103 pp.

Johnston, G. R., J.C. Mitchell, G. A. Schemitz, P. L. Butt and J. M Adler 2018. Origin and structure of a large aggregation of Suwannee Cooters (*Pseudemys concinna suwanniensis*) in a Florida spring. Chelonian Conservation and Biology, Volume 17, number 1, 54-62 pp.

Jones, G. W., S. B. Upchurch and K. M. Champion. 1996. Origin of nitrate in groundwater discharging from Rainbow Springs, Marion County, Florida. Southwest Florida Water Management District, Brooksville, Florida. 155 pp.

Karst Environmental Services 1997. Ichetucknee Springs Water Quality Working Group Cooperative Dye Trace: Rose Creek Swallet-Ichetucknee Springs Group, Suwannee River Water Management District

Katz B. D. and D. Hornsby 1998. A preliminary assessment of sources of nitrate in springwaters, Suwannee River Basin, Florida. United States Geological Survey Open-File Report 98-69. 23 pp.

Katz, B. G., H. D. Hornsby, J. K. Böhlke, and M. F. Mokray 1999. Sources and chronology of nitrate contamination in spring waters, Suwannee River basin, Florida**:** U.S. Geological Survey Water Resources Investigations Report 99-4252, 54 pp.

Kenner, S. J., S. Singh, K. Coates, W. C. Huber, J. P. Heany 1991. Review and Development of Water Quality Criteria for the Suwannee River. Interim Report to Suwannee River Water Management District. Contract 89/90-93. Suwannee River Water Management District, Live Oak, Florida. 243 pp.

Kincaid, T. 1998. Rapid river water intrusion to the unconfined Floridan aquifer. Journal of Environmental and Engineering Geoscience. Volume 4, Number 3, College Station, Texas. Pp. 361-374.

Kincaid, T. 2011. How much is too much? Toward a water budget approach to water management (Lower Santa Fe River Springshed map). Suwannee River Water Management District Minimum Flows and Levels Workshop, Power Point Presentation in Lecanto Florida on 26 October 2011. Suwannee River Water Management District, Live Oak, Florida.

Knight, R. L. 2015. *Silenced Springs:(moving from Tragedy to Hope)*. Howard T. Odum Florida Springs Institute.

Knight, R. L., and R. A. Clarke 2016. Florida Springs: A water budget approach to estimating water availability. Journal of Earth Science and Engineering. ISSN 2159-581X. Volume 6, Number 2. Pp. 59-72.

Kolasa, J., and S. T. A. Pickett 1992. Ecosystem stress and health: an expansion of the conceptual basis. Journal of Aquatic Ecosystem Health, Volume 1. Pp 7-13.

Kriebel, D., J. Tickner, P. Epstein, J. Lemons, R. Levins, E. Loechler, M. Quinn, R. Rudel, T. Schettler, M. Stoto 2001. The precautionary principle in environmental science. Environmental Health Perspectives, Volume 9, Number 9. 871-876 pp.

Kurtz, R. C., D. C. Woithe, S. K. Notestein, T. K. Frazer, J. A. Hale, and S. R. Keller 2004. Mapping and monitoring submerged aquatic vegetation in Ichetucknee Springs-2004. Technical Report to Suwannee River Water Management District.

Lapointe, B., R. Brewton, L. Herron, J. Porter, C. Hu 2019. Nitrogen enrichment, altered stoichiometry, and coral reef declin at looe Key, Florida Keys, USA: a 3-decade study. Marine Biology, Volume 106, Number 108. 31 pp.

Liebowitz, D. M., M. J. Cohen, J. B. Heffernan, L. V. Korhnak, and T. K. Frazer 2014. Environmentally-mediated consumer control of algal proliferation in Florida springs. Freshwater Biology, Volume 59, number 10, 2009–2023 pp.

Light, H. M., M. R. Darst, L. J. Lewis 2002. Hydrology, vegetation, and soils of riverine and tidal floodplain forests of the lower Suwannee River, Florida, and potential impacts of flow reductions. United States Geological Survey Professional Paper 1656A 124 pp.

Macesich, M. 1988. Geologic interpretation of the aquifer pollution potential in Alachua County, Florida. Open File Report No. 21, Florida Geological Survey, Tallahassee, Florida, 25pp.

Martin J.B., and S. L. Gordon 2000. Surface and ground water mixing, flow paths, and temporal variations in chemical compositions of karst springs. In: Sasowsky ID, Wicks C (eds) Groundwater flow and contaminant transport in carbonate aquifers. Balkema, Rotterdam, The Netherlands

Martin, J. B. and R. W. Dean. 2001. Exchange of water between conduits and matrix in the Floridan aquifer. Chemical Geology Volume 179 Numbers 1-4, Pp. 145-165.

Meyer, F. W. 1962. Reconnaissance of the geology and groundwater resources of Columbia County, Florida: Florida Geological Survey Report of Investigations Number 30. 74 pp.

Meyer, B. A., T. R. Kincaid, and T. H. Hazlett. 2008. Modeling karstic controls on watershed-scale groundwater flow in the Floridan aquifer of North Florida. *In* Sinkholes and the engineering and environmental impacts of karst. Eds. L. B. Yuhr, E. C. Alexander, Jr., and B. F. Beck. Geotechnical Special Publication Number 183, American Society of Civil Engineers, Reston, Virginia. Pp. 351-361.

Miller, J.A. 1986. Hydrogeologic framework of the Floridan Aquifer System in Florida and in parts of Georgia, Alabama, and South Carolina. United States Geological Survey Professional Paper 1403-B, Washington D.C. 91 pp.

Morris, T. L., P.L. Butt, G.A. Schemitz, G. Owen and A. Whann 2017. Santa Fe River springs biological/botanical survey with focus on submerged aquatic vegetation: Selected Santa Fe River springs, Alachua, Columbia, and Gilchrist Counties, Florida. Report for Alachua County Environmental Protection Department, Gainesville, Florida. September 29, 2017. 54 pp. +Appendices.

Morris, T. L., P.L. Butt, G. Owen and 2018. Santa Fe River springs biological/botanical survey with focus on submerged aquatic vegetation: Selected Santa Fe River springs, Alachua, Columbia, and Gilchrist Counties, Florida. Report for Alachua County Environmental Protection Department, Gainesville, Florida. December 31, 2018. 85 pp. +Appendices.

Munch, D., D. Toth, C. Huang, J. Davis, C. Fortich, W. Osburn, E. Phlips, E. Quinlan, M. Allen, M. Woods, P. Cooney, R. Knight, R. Clarke, S. Knight 2006. Fifty-year retrospective study of the ecology of Silver Springs, Florida. Final report to Florida Department of Environmental Protection, Tallahassee, Florida. 314 pp. + Appendices.

North Central Florida Regional Planning Council 2018. North Central Florida Strategic Regional Policy Plan August 2018 Gainesville, Florida 261 pp + Appendices.

Obreza, T., and G. Means 2006. Characterizing agriculture in Florida's Lower Suwannee River Basin area. University of Florida, Institute of Food and Agricultural Sciences SL 241. Gainesville, Florida. 15 pp.

Odum, H.T. 1957. Trophic structure and productivity of Silver Springs, Florida. Ecological Monographs, Volume 27, Number 1. 55-112 pp.

Pittman, J. R., H. H. Hatzell, and E. T. Oaksford 1997. Spring contributions to water quantity and nitrate loads in the Suwannee River during base flow in July 1995. United States Geological Survey Water-Resources Investigations Report 97-4152. Washington D.C 12 pp.

Pringle, C. M. 1997. Exploring how disturbance is transmitted upstream: Going against the flow. Journal of the North American Benthological Society. Volume 16, Number 2, Pp. 425-438.

Puri, H. S. and R. O Vernon 1964. Summary of the geology of Florida and a guidebook to the classic exposures. Florida Geologic Survey Special Publication Number 5 (revised). 312 pp.

Quinlan, E. B. 2003. Consequences of nutrient loading in the Suwannee River and Estuary, Florida. Dissertation, University of Florida 152 pp.

Reaver, N. G. F., Kaplan, D. A., Mattson, R. A., Carter, E., Sucsy, P. V., & Frazer, T. K. (2019). Hydrodynamic controls on primary producer communities in spring-fed rivers. Geophysical Research Letters, 46, 4715–4725. https://doi.org/10.1029/2019GL082571

Rosenau, J. C., G. L. Faulkner, C. W. Hendry, and R. W. Hull 1977. Springs of Florida. Bulletin 31 (Revised). United States Geological Survey. 461 pp.

Scott, T. M., G. H. Means, R. P. Meegan, R. C. Means, S. B. Upchurch, R. E. Copeland, J. Jones, T. Roberts, and A. Willet 2004. Springs of Florida. Florida Geological Survey Bulletin Number 66. 377 pp.

Sepulveda, N. 2002. Simulation of ground-water flow in the intermediate and Floridan aquifer systems in peninsular Florida. United States Geological Survey Water-Resources Investigations Report, Number 02-4009. 138 pp.

Skiles, W. A., A. Hayes and P. L. Butt 1991. Ichetucknee hydrogeology study. Karst Environmental Services, High Springs, Florida. 150 pp.

Smith, R. C., J. S. Dunbar, M. Faught, G. Farr and W. O. Gifford 1997. An underwater archaeological survey in the Santa Fe River, Florida, July 1997. Florida Archaeological Reports 36. FL. Department of State, Division of Historical Resources, Bureau of Archaeological Research Tallahassee Florida. 77 pp.

Smith, L. S., J. Stober, H. E. Balbach and W. D. Meyer 2009. Gopher tortoise survey handbook (No. ERDC/CERL-TR-09-7). USACOE, Engineer Research and Development Center Champaign IL, Construction Engineering Research Laboratory 50 pp.

Stevenson, R. J., A. Pinowska, A. Albertin, and J.O. Sickman 2007. Ecological condition of algae and nutrients in Florida springs: The synthesis report. FDEP Contract WM 858. Florida Department Environmental Protection, Tallahassee, Florida. 57 pp.

Suwannee River Water Management District (SRWMD) 2006. Surface water quality and biological annual report. Technical Report WR05/06-02, Suwannee River Water Management District, Live Oak, Florida. September 2006. 321 pp.

SRWMD 2007. Minimum Flows and Levels Establishment for the Upper Santa Fe River. Final Technical Report, Suwannee River Water Management District, May 2007. 291 pp.

SRWMD 2013. Minimum flows and levels for the Lower Santa Fe and Ichetucknee rivers and priority springs. Final Technical Report Suwannee River Water Management District, Live Oak, Florida, November 22, 2013. 226 pp.

SRWMD 2014. Recovery strategy: Lower Santa Fe and Ichetucknee rivers and priority springs Minimum flows and levels. Final Technical Report Suwannee River Water Management District, Live Oak, Florida, April 8, 2014. 63 pp.

SRWMD 2018. Suwannee River Water Management District Water Data Portal. Web-based water quality data database, accessed January 2018 at URL http://www.mysuwanneeriver.org/portal/springs.htm

United States Geological Survey (USGS) 2018. United States Geological Survey Surface-Water Data for Florida. Web-based Water Quality Data Database, accessed January 2018 at URL http://waterdata.usgs.gov/fl/nwis/sw

Upchurch, S. B. 2002. Hydrogeochemistry of a karst escarpment. In J.B. Martin, C.M. Wicks, and I.D. Sasowsky (eds.), Hydrogeology and Biology of Post-Paleozoic Carbonate Aquifers. Charles Town, West Virginia, Karst Waters Institute, Special Publication 7, pp.73-75.

Upchurch, S. B., and K. M. Champion 2004. Delineation of spring protection areas at five first magnitude springs in north-central Florida. Suwannee River Water Management District Live Oak, Florida. Draft Technical Report Project number 3008033. 21 pp.

Upchurch, S. B., J. Chen, and C. R. Cain 2007. Trends of nitrate concentration in waters of the Suwannee River Water Management District, 2007. Suwannee River Water Management District. Live Oak, Florida, 36 pp.

Upchurch, S. B., J. Chen, and C. R. Cain 2011. Springsheds of the Santa Fe River. Report for Alachua County Board of Commissioners, Gainesville, Florida. October 28, 2011. 93 pp.

U.S. Census Bureau. 2013. State and County Quickfacts. http://quickfacts.census.gov/qfd/index.html, 2014.

Verdi, R. J., S. A. Tomlinson, and R. L. Marella 2006. The drought of 1998-2002: Impacts on Florida's hydrology and landscape. United States Geological Survey Circular 1295. 34 pp.

Verdi, R. J. and S. A. Tomlinson 2009. A centennial tribute, 1906-2006: History of United States Geological Survey streamgaging activities for the Suwannee River at White Springs, Florida. United States Geological Survey Circular 1330. 43 pp.

VISIT FLORIDA. 2018. 2017 Florida Visitor Study. Tallahassee, FL 121 pp.

Weatherspoon, R. L., K., E. Cummings, W.H. Wittstruck 1992. Soil Survey of Gilchrist County, Florida. United States Department of Agriculture, Soil Conservation Service, Washington D.C. 150 pp. + Appendices.

Wetland Solutions Inc. (WSI) 2010. An ecosystem-level study of Florida's springs. Florida Fish and Wildlife Conservation Commission Project Agreement Number 08010. Final Report to multiple agencies, Wetland Solutions Incorporated, Gainesville, Florida. 236 pp. + Appendices.

White, W. 1970. The geomorphology of the Florida peninsula. Geological Bulletin No. 51. State of Florida Department of Natural Resources, Bureau of Geology, Division of Resource Management, Florida Department of Natural Resources, Tallahassee. 164 pp +Maps.

Whitford, L.A. 1956. The communities of algae in springs and spring streams of Florida. Ecology, Volume 31, Number 3. 433-442 pp.

Williams, K., D. Nicola, and A. Randazzo 1977. The Geology of the Western Part of Alachua County, Florida. Report of Investigations No. 85, Florida Bureau of Geology, Tallahassee, Florida. 98 pp.

Williams, L.J., A. D. Dausman, and J. C. Bellino 2011. Relation of aquifer confinement and long-term groundwater level decline in the Floridan aquifer system. Proceedings of the 2011 Georgia Water Resources Conference held April 11–13, 2011, at the University of Georgia, Athens, Georgia. 2 pp. abstract + map.

THIS PAGE INTENTIONALLY LEFT BLANK

Appendix 4—Soil Descriptions

(2) Penney fine sand, 0 to 5 percent slopes - This excessively drained, nearly level soil is on uplands. Slopes are gentle and nearly smooth or convex.

Typically, the surface layer is dark grayish brown fine sand about 7 inches thick. The underlying material, to a depth of about 80 inches, is fine sand. The upper 10 inches is pale brown and the next 39 inches is very pale brown. The lower 24 inches also is very pale brown and has thin layers of yellowish-brown loamy fine sand.

Permeability is rapid in the Penney soil. The available water capacity is very low, and runoff is slow. The water table is below a depth of 6 feet.

(3) Penney fine sand, 5 to 8 percent slopes - This soil is moderately sloping and excessively drained. It is in small areas on sharp-breaking slopes and on relatively long slopes on broad uplands. Slopes are smooth or convex.

Typically, the surface layer is gray fine sand about 5 inches thick. The underlying material, to a depth of 80 inches or more, is fine sand, while the upper 13 inches is light yellowish-brown. The next 33 inches is very pale brown, as is the 29 inches under that (the latter with thin layers of yellowish-brown loamy fine sand).

Permeability is rapid in the Penney soil. The available water capacity is very low, and runoff is slow. The water table is below a depth of 6 feet.

(11) Ortega fine sand, 0 to 5 percent slopes - This soil is nearly level, gently sloping, and moderately well drained. It is on slight knolls in the flatwoods and on ridges in the uplands. Slopes are nearly smooth or convex.

Typically, the surface layer is very dark grayish brown fine sand about 6 inches thick. The underlying material, to a depth of about 80 inches, is fine sand. The upper part is brown and pale brown, and the lower part, below a depth of 60 inches, is light gray.

Permeability is rapid in the Ortega soil, and the available water capacity is low. The water table is at a depth of 48 to 60 inches for 1 to 5 months during most years. During droughty periods, it is at a depth of more than 60 inches.

(12) Albany fine sand, 0 to 5 percent slopes - This soil is nearly level, gently sloping, and somewhat poorly drained. It is on the lower parts of broad, low ridges and on slight knolls in the flatwoods. Slopes are nearly smooth or convex.

Typically, the surface layer is very dark gray fine sand about 7 inches thick. The subsurface layer is fine sand that extends to a depth of about 41 inches. The

upper 17 inches is pale brown, and the lower 17 inches is very pale brown. The subsoil, to a depth of 80 inches or more, is fine sandy loam. It is light gray in the upper part and, in the lower part, mottled yellowish-brown, pale brown, and light gray.

Permeability is moderate in the Albany soil, and the available water capacity is low. The water table is at a depth of 12 to 30 inches for 1 to 6 months during most years.

(30) Fluvaquents, frequently flooded - These nearly-level soils are poorly drained or very poorly drained. They are on flood plains and consist mainly of sandy, loamy, and clayey strata. In some areas, however, they have organic layers. The texture varies widely within short distances. Slopes are 0 to 2 percent.

Typically, the surface layer is black mucky fine sand about 2 inches thick. The underlying strata extend to a depth of about 80 inches. In a sequence downward, they commonly are: dark gray sandy clay loam; pale brown silt loam that has many fine and medium white shell fragments; very dark gray silt loam that has few white shell fragments; very pale brown sandy loam that has many fine and medium white shell fragments; light yellowish-brown sandy loam that has pockets of white sand; and white sand that has many white shell fragments.

Permeability is moderate in the Fluvaquents, and the available water capacity is low. The water table is at the surface during wet periods; during dry periods, it recedes to a depth of more than 20 inches. Flooding occurs during most years.

(35) Alpin fine sand, 0 to 5 percent slopes - This soil, on uplands, is nearly level, gently sloping, and excessively drained. Slopes are nearly smooth or convex.

Typically, the surface layer is dark gray fine sand about 6 inches thick. The underlying material, to a depth of about 80 inches, is fine sand. The upper 12 inches is light yellowish-brown, while the next 33 inches is very pale brown. The lower 29 inches also is very pale brown, with thin layers of yellowish-brown loamy fine sand.

In the Alpin soil, permeability is rapid, available water capacity is low, and runoff is very slow. The water table is below a depth of 6 feet.

Appendix 5—Plant and Animal List

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

LICHENS

.....	*Brigantaea* sp.
.....	*Bulbothrix* sp.
Smooth eyelash lichen.....	*Bulbothrix confoederata*
Powdery Texas shield lichen.....	*Canoparmelia texana*
Deer moss; powder-puff lichen.	*Cladonia evansii*
Powder-foot British soldiers.....	*Cladonia incrassata*
Jester cladonia	*Cladonia leporina*
Turban lichen.....	*Cladonia peziziformis*
Slender ladder lichen.....	*Cladonia rappii*
Powdery peg lichen.....	*Cladonia subradiata*
Dixie reindeer lichen	*Cladonia subtenuis*
Salted shell lichen.....	*Coccocarpia palmicola*
Narrow-lobed shell lichen.....	*Coccocarpia stellata*
Cotton lichen	*Crocynia pyxinoides*
Christmas lichen.....	*Cryptothecia rubrocincta*
Green Christmas lichen.....	*Cryptothecia striata*
Powdery medallion lichen.....	*Dirinaria picta*
White fringe lichen.....	*Heterodermia albicans*
Orange-bellied fringe lichen.....	*Heterodermia crocea*
Flowering fringe lichen	*Heterodermia echinata*
Wrinkled loop lichen.....	*Hypotrachyna livida*
Grainy loop lichen.....	*Hypotrachyna osseoalba*
Pustulate loop lichen	*Hypotrachyna pustulifera*
.....	*Leptogium* sp.
Florida skin lichen.....	*Leptogium floridanum*
Margin-fruiting jellyskin.....	*Leptogium marginellum*
Stretched jellyskin	*Leptogium millegranum*
.....	*Micarea* sp.
K + y-r unwhiskered	*Parmotrema cristiferum complex*
UV-perforated ruffle.....	*Parmotrema perforatum complex*
K-P-soredia crescent shape	*Parmotrema praesorediosum*
Long-whiskered lichen.....	*Parmotrema rampoddense*
Cracked ruffle lichen	*Parmotrema reticulatum*
Palm ruffle lichen.....	*Parmotrema tinctorum*
Green ruffle lichen	*Parmotrema xanthinum*
.....	*Pertusaria texana*
Marg. soredia buttoned rosette.	*Pyxine cocoes*
.....	*Ramalina* sp.
Peruvian cartilage lichen.....	*Ramalina peruviana*
Southern strap lichen	*Ramalina stenospora*
Powder-tipped beard lichen.....	*Usnea dimorpha*
Bloody beard lichen.....	*Usnea mutabilis*
Bushy beard lichen	*Usnea strigosa*

* Non-native species

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

PTERIDOPHYTES

Resurrection fern ..... *Pleopeltis polypodioides* var. *michauxiana*
Tailed bracken..... *Pteridium aquilinum* var. *pseudocaudatum*

GYMNOSPERMS

Red cedar ..... *Juniperus virginiana*
Slash pine ..... *Pinus elliottii*
Longleaf pine ..... *Pinus palustris*
Bald-cypress ..... *Taxodium distichum*

ANGIOSPERMS

MONOCOTS

Splitbeard bluestem ..... *Andropogon ternarius*
Broomsedge bluestem ..... *Andropogon virginicus*
Arrowfeather threeawn..... *Aristida purpurascens*
Wiregrass ..... *Aristida stricta* var. *beyrichiana*
Pitted beardgrass..... *Bothriochloa pertusa* *
Woodoats ..... *Chasmanthium* sp.
Witchgrass..... *Dichanthelium* sp.
Elliott's lovegrass..... *Eragrostis elliottii*
Bigtop lovegrass..... *Eragrostis hirsuta*
Purple lovegrass..... *Eragrostis spectabilis*
Centipedegrass ..... *Eremochloa ophiuroides* *
Pinewoods fingergrass..... *Eustachys petraea*
Waterthyme; hydrilla ..... *Hydrilla verticillata* *
Spring-run spiderlily..... *Hymenocallis rotata*
Fringed yellow stargrass ..... *Hypoxis juncea*
Beaked panicum ..... *Panicum anceps*
Maidencane ..... *Panicum hemitomon*
Bahiagrass..... *Paspalum notatum* *
Dwarf palmetto ..... *Sabal minor*
Cabbage palm ..... *Sabal palmetto*
Silver plumegrass ..... *Saccharum alopecuroides*
Spring-tape ..... *Sagittaria kurziana*
Saw palmetto..... *Serenoa repens*
Yellow bristlegrass ..... *Setaria parviflora*
Earleaf greenbrier..... *Smilax auriculata*
Saw greenbrier..... *Smilax bona-nox*
Cat greenbrier..... *Smilax glauca*

* Non-native species

Common Name	*Scientific Name*	Primary Habitat Codes (for imperiled species)
Lopsided indiangrass	*Sorghastrum secundum*	
Curtiss' dropseed	*Sporobolus curtissii*	
American eelgrass	*Vallisneria americana*	
Adam's needle	*Yucca filamentosa*	
Rainlily	*Zephyranthes atamasca*	BF

DICOTS

Boxelder	*Acer negundo*	
Red maple	*Acer rubrum*	
Florida maple	*Acer saccharum* ssp. *floridanum*	
Silktree; Mimosa	*Albizia julibrissin* *	
Common ragweed	*Ambrosia artemisiifolia*	
Peppervine	*Ampelopsis arborea*	
Slimleaf pawpaw	*Asimina angustifolia*	
Woolly pawpaw	*Asimina incana*	
Groundsel tree; Sea-myrtle	*Baccharis halimifolia*	
White wild indigo	*Baptisia alba*	
Pineland wild indigo	*Baptisia lecontei*	
Beggarticks	*Bidens alba*	
Crossvine	*Bignonia capreolata*	
American beautyberry	*Callicarpa americana*	
Coastalplain chaffhead	*Carphephorus corymbosus*	
American hornbeam	*Carpinus caroliniana*	
Wild olive	*Cartrema americanum*	
Water hickory	*Carya aquatica*	
Pignut hickory	*Carya glabra*	
Sugarberry; Hackberry	*Celtis laevigata*	
Common buttonbush	*Cephalanthus occidentalis*	
Eastern redbud	*Cercis canadensis*	
Tread-softly	*Cnidoscolus stimulosus*	
Canadian horseweed	*Conyza canadensis*	
Flowering dogwood	*Cornus florida*	
Parsley hawthorn	*Crataegus marshallii*	
Slender scratchdaisy	*Croptilon divaricatum*	
Summer farewell	*Dalea pinnata*	
Carolina ponysfoot	*Dichondra carolinensis*	
Common persimmon	*Diospyros virginiana*	
Dogtongue wild buckwheat	*Eriogonum tomentosum*	
Coralbean; Cherokee bean	*Erythrina herbacea*	
Dogfennel	*Eupatorium capillifolium*	
Yankeeweed	*Eupatorium compositifolium*	
Carolina ash; pop ash	*Fraxinus caroliniana*	
Bedstraw	*Galium* sp.	
Gardenia	*Gardenia* sp. *	

* Non-native species

Ruth B. Kirby Gilchrist Blue Springs State Park
Plants

Common Name	*Scientific Name*	Primary Habitat Codes (for imperiled species)
Yellow jessamine	*Gelsemium sempervirens*	
English Ivy	*Hedera helix*	
Pinebarren frostweed	*Helianthemum corymbosum*	
Camphorweed	*Heterotheca subaxillaris*	
Cowitch vine	*Hydrangea barbara*	
Marshpennywort	*Hydrocotyle* sp.	
Indian swampweed	*Hygrophila polysperma* *	
St. John's-wort	*Hypericum* sp.	
Carolina holly; Sand holly	*Ilex ambigua*	
Dahoon	*Ilex cassine* var. *cassine*	
American holly	*Ilex opaca*	
Yaupon	*Ilex vomitoria*	
Morning-glory	*Ipomoea* sp.	
Virginia willow	*Itea virginica*	
Pinweed	*Lechea* sp.	
Hairy lespedeza	*Lespedeza hirta*	
Gopher apple	*Licania michauxii*	
Sweetgum	*Liquidambar styraciflua*	
Creeping primrosewillow	*Ludwigia repens*	
Southern magnolia	*Magnolia grandiflora*	
S. bayberry; Wax myrtle	*Myrica cerifera*	
Swamp tupelo	*Nyssa sylvatica* var. *biflora*	
Pricklypear	*Opuntia humifusa*	
Coastalplain palafox	*Palafoxia integrifolia*	
Virginia creeper	*Parthenocissus quinquefolia*	
Red bay	*Persea borbonia*	
Oak mistletoe	*Phoradendron leucarpum*	
Chamber bitter	*Phyllanthus urinaria* *	
Narrowleaf silkgrass	*Pityopsis graminifolia*	
American sycamore	*Platanus occidentalis*	
Tall jointweed	*Polygonella gracilis*	
Pickerel Weed	*Pontederia cordata*	
Chickasaw plum	*Prunus angustifolia*	
Carolina laurelcherry	*Prunus caroliniana*	
Black cherry	*Prunus serotina*	
Sand live oak	*Quercus geminata*	
Bluejack oak	*Quercus incana*	
Turkey oak	*Quercus laevis*	
Laurel oak; Diamond oak	*Quercus laurifolia*	
Overcup oak	*Quercus lyrata*	
Sand post oak	*Quercus margaretta*	
Swamp chestnut oak	*Quercus michauxii*	
Water oak	*Quercus nigra*	
Live oak	*Quercus virginiana*	
Sweet pinxter azalea	*Rhododendron canescens*	

* Non-native species

Ruth B. Kirby Gilchrist Blue Springs State Park
Plants

Common Name	*Scientific Name*	Primary Habitat Codes (for imperiled species)
Winged sumac	*Rhus copallinum*	
Snoutbean	*Rhynchosia* sp.	
Sand blackberry	*Rubus cuneifolius*	
Lyreleaf sage	*Salvia lyrata*	
Lizard's tail	*Saururus cernuus*	
Whitetop aster	*Seriocarpus tortifolius*	
Bully	*Sideroxylon* sp.	
Goldenrod	*Solidago* sp.	
Queensdelight	*Stillingia sylvatica*	
Eastern poison ivy	*Toxicodendron radicans*	
Chinese tallowtree	*Triadica sebifera* *	
American elm	*Ulmus americana*	
Cedar elm	*Ulmus crassifolia*	
Sparkleberry	*Vaccinium arboreum*	
Shiny blueberry	*Vaccinium myrsinites*	
Deerberry	*Vaccinium stamineum*	
Walter's viburnum	*Viburnum obovatum*	
Prostrate blue violet	*Viola walteri*	
Summer grape	*Vitis aestivalis*	
Muscadine	*Vitis rotundifolia*	
Hercules-club	*Zanthoxylum clava-herculis*	

* Non-native species

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

INVERTEBRATES

Ants, Bees, and Wasps

Thread-waisted Wasp	*Ammophila pictipennis*	MTC
Bumblebee	*Bombus* sp.	MTC
Pyramid Ant	*Dorymyrmex bureni*	MTC
Florida Harvester Ant	*Pogonomyrmex badius*	SH
	Pseudomyrmex seminole	MTC
Red Imported Fire Ant	*Solenopsis invicta* *	MTC

Spiders

Florida Argiope	*Argiope florida*	MTC
Spinybacked Orbweaver	*Gasteracantha cancriformis*	MTC
Orchard Orbweaver	*Leucauge venusta*	MTC
Golden Silk Orbweaver	*Nephila clavipes*	MTC

Dragonflies

Common Green Darner	*Anax junius*	MTC
Variable Dancer	*Argia fumipennis*	SRST
Blue-ringed Dancer	*Argia sedula*	SRST
Swamp Darner	*Epiaeschna heros*	BF, FS, BS
Eastern Pondhawk	*Erythemis simplicicollis*	MTC
Little Blue Dragonlet	*Erythrodiplax minuscula*	MTC
Twilight Darner	*Gynacantha nervosa*	BF, FS, BS
Smoky Rubyspot	*Hetaerina titia*	SRST
Cyrano Darner	*Nasiaeschna pentacantha*	MTC
Blue Dasher	*Pachydiplax longipennis*	MTC
Wandering Glider	*Pantala flavescens*	MTC
Carolina Saddlebags	*Tramea carolina*	MTC
Phantom Darner	*Triacanthagyna trifida*	UHF, FS

Grasshoppers

Brown Winter GH	*Amblytropidia mysteca*	MTC
Linear-winged GH	*Aptenopedes sphenarioides*	MTC
Southern Yellow-winged GH	*Arphia granulata*	MTC
Southern Green-striped GH	*Chortophaga viridifasciata australior*	MTC
Carolina GH	*Dissosteira carolina*	MTC
Southern Red-legged GH	*Melanoplus propinquus*	MTC
Oak Spur-throat GH	*Melanoplus querneus*	BS, SH
Atlantic GH	*Paroxya atlantica*	MTC
Eastern Lubber GH	*Romalea microptera*	MTC
American Bird GH	*Schistocerca americana*	MTC
Mischievous Bird GH	*Schistocerca damnifica*	SH
Rusty Bird GH	*Schistocerca rubiginosa*	SH
Ridgeback Sand GH	*Spharagemon cristatum*	SH

* Non-native species

Common Name	*Scientific Name*	Primary Habitat Codes (for all species)
Marbled GH	*Spharagemon marmoratum*	SH
Handsome GH	*Syrbula admirabilis*	SH
Butterflies and Moths		
Gulf Fritillary	*Agraulis vanillae*	MTC
Horace's Duskywing	*Erynnis horatius*	MTC
Barred Yellow	*Eurema daira*	MTC
Little Yellow	*Eurema lisa*	MTC
Sleepy Orange	*Eurema nicippe*	SH
Zebra Heliconian	*Heliconius charitonius*	MTC
Ceraunus Blue	*Hemiargus ceraunus*	MTC
Carolina Satyr	*Hermeuptychia sosybius*	MTC
Common Buckeye	*Junonia coenia*	MTC
Cloudless Sulphur	*Phoebis sennae*	MTC
Phaon Crescent	*Phyciodes phaon*	MTC
Polyphemus Moth	*Antheraea polyphemus*	MTC
Long-tailed Skipper	*Urbanus proteus*	MTC
Crustaceans		
Spring Crayfish	*Procambarus spiculifer*	SRST
Mollusks		
Rasp Elimia	*Elimia floridensis*	SRST
Florida Applesnail	*Pomacea paludosa*	SRST, BST
Manatee Treesnail	*Drymaeus dormani*	FS, BF

FISH

Bowfin	*Amia calva*	SRST, BST
American Eel	*Anquilla rostrata*	SRST, BST
Brown Darter	*Etheostoma edwini*	SRST, BST
Eastern Mosquitofish	*Gambusia holbrooki*	SRST, FS, BS
Least Killifish	*Heterandria formosa*	SRST, BST
Florida Gar	*Lepisosteus platyrhincus*	SRST, BST
Redbreast Sunfish	*Lepomis auritus*	SRST, BST
Bluegill	*Lepomis macrochirus*	SRST, BST
Redear Sunfish	*Lepomis microlophus*	SRST, BST
Spotted Sunfish	*Lepomis punctatus*	SRST, BST
Bluefin Killifish	*Lucania goodei*	SRST, BST
Suwannee Bass	*Micropterus notius*	SRST, BST
Florida Largemouth Bass	*Micropterus salmoides floridanus*	SRST, BST
Spotted Sucker	*Minytrema melanops*	SRST, BST
Striped Mullet	*Mugil cephalus*	SRST, BST
Redeye Chub	*Notropis harperi*	SRST, BST
Tadpole Madtom	*Noturus gyrinus*	SRST, BST

* Non-native species

Common Name	*Scientific Name*	Primary Habitat Codes (for all species)
Blackbanded Darter	*Percina nigrofasciata*	SRST, BST
Sailfin Molly	*Poecilia latipinna*	SRST, BST
Atlantic Needlefish	*Strongylura marina*	SRST, BST
Gulf Pipefish	*Syngnathus scovelli*	SRST, BST
Hogchoker	*Trinectes maculatus*	SRST, BST
AMPHIBIANS		
Frogs and Toads		
Southern Toad	*Anaxyrus terrestris*	MTC
Greenhouse Frog	*Eleutherodactylus planirostris* *	MTC
Cope's Gray treefrog	*Hyla chrysoscelis*	FS, AF, BF
Spring Peeper	*Pseudacris crucifer*	FS, AF, BF
Salamanders and Amphiumas		
Lesser Siren	*Siren intermedia*	SRST, FS
Greater Siren	*Siren lacertina*	SRST, FS
REPTILES		
Turtles		
Florida Softshell	*Apalone ferox*	SRST, BST
Florida Snapping Turtle	*Chelydra serpentina osceola*	SRST, FS
Gopher Tortoise	*Gopherus polyphemus*	SH
Striped Mud Turtle	*Kinosternon baurii*	SKLK, BST
Suwannee Alligator Snapping	*Macrochelys suwanniensis*	SRST, BST
Florida Red-bellied Cooter	*Pseudemys nelsoni*	SRST, BST
Peninsula Cooter	*Pseudemys peninsularis*	SRST, BST
Suwannee Cooter	*Pseudemys suwanniensis*	SRST, BST
Loggerhead Musk Turtle	*Sternotherus minor*	SRST
Eastern Musk Turtle; Stinkpot	*Sternotherus odoratus*	SKLK, BST
Yellow-bellied Slider	*Trachemys scripta scripta*	SRST, BST
Lizards		
Green Anole	*Anolis carolinensis*	MTC
Eastern Fence Lizard	*Sceloporus undulatus*	SH
Snakes		
Southern Black Racer	*Coluber constrictor priapus*	SH
E. Diamond-backed Rattlesnake	*Crotalus adamanteus*	SH, BF, SHF
Plain-bellied Water Snake	*Nerodia erythrogaster*	SRST, BST
Florida Water Snake	*Nerodia fasciata pictiventris*	SRST, BST
BIRDS		

* Non-native species

Common Name	*Scientific Name*	Primary Habitat Codes (for all species)
Turkeys		
Wild Turkey	*Meleagris gallopavo*	SH
Cranes		
Sandhill Crane	*Antigone canadensis*	OF
Storks		
Wood Stork	*Mycteria americana*	FS, OF
Cormorants		
Double-crested Cormorant	*Phalocrocorax auritus*	SRST, BST, OF
Herons, Egrets, and Bitterns		
Great Blue Heron	*Ardea herodias*	SRST, BST
Great Egret	*Ardea alba*	SRST, BST
New World Vultures		
Turkey Vulture	*Cathartes aura*	SHF, OF
Kites, Eagles, and Hawks		
Bald Eagle	*Haliaeetus leucocephalus*	BST, OF
Red-shouldered Hawk	*Buteo lineatus*	MTC, OF
Pigeons and Doves		
Mourning Dove	*Zenaida macroura*	MTC
Owls		
Barred Owl	*Strix varia*	AF, BF, FS
Kingfishers		
Belted Kingfisher	*Ceryle alcyon*	SRST, BST
Woodpeckers		
Red-bellied Woodpecker	*Melanerpes carolinus*	MTC
Yellow-bellied Sapsucker	*Sphyrapicus varius*	UHF, BF, SH
Downy Woodpecker	*Picoides pubescens*	MTC
Northern Flicker	*Colaptes auratus*	SH
Pileated Woodpecker	*Dryocopus pileatus*	MTC
Tyrant Flycatchers		
Eastern Phoebe	*Sayornis phoebe*	MTC
Vireos and Allies		
White-eyed Vireo	*Vireo griseus*	SH, SHF, AFP
Blue-headed Vireo	*Vireo solitarius*	UHF, BF, SH, SHF

* Non-native species

Common Name	*Scientific Name*	Primary Habitat Codes (for all species)
Crows and Jays		
Blue Jay	*Cyanocitta cristata*	MTC
American Crow	*Corvus brachyrhynchos*	MTC, OF
Fish Crow	*Corvus ossifragus*	OF
Tits and Allies		
Carolina Chickadee	*Poecile carolinensis*	MTC
Tufted Titmouse	*Baeolophus bicolor*	MTC
Wrens		
Carolina Wren	*Thryothorus ludovicianus*	MTC
House Wren	*Troglodytes aedon*	SH, SHF, AFP
Kinglets		
Ruby-crowned Kinglet	*Regulus calendula*	MTC
Old World Warblers		
Blue-gray Gnatcatcher	*Polioptila caerulea*	MTC
Thrushes		
Swainson's Thrush	*Catharus ustulatus*	UHF, AF, BF
Hermit Thrush	*Catharus guttatus*	UHF, AF, BF, SHF
American Robin	*Turdus migratorius*	MTC
Mockingbirds and Thrashers		
Northern Mockingbird	*Mimus polyglottos*	SH, AFP, DV
New World Warblers		
Black-and-white Warbler	*Mniotilta varia*	MTC
Orange-crowned Warbler	*Oreothlypis celata*	SH, UHF, SHF
Palm Warbler	*Setophaga palmarum*	SH, UC, DV
Yellow-rumped Warbler	*Setophaga coronata*	MTC
Yellow-throated Warbler	*Setophaga dominica*	SH, UHF, AF, BF
Black-throated Green Warbler	*Setophaga virens*	SH, UHF, SHF
Sparrows and Allies		
Eastern Towhee	*Pipilo erythrophthalmus*	SH, AFP
Chipping Sparrow	*Spizella passerina*	SH, UC, DV
White-crowned Sparrow	*Zonotrichia leucophrys*	SH, UHF
Cardinals, Grosbeaks, and Allies		
Northern Cardinal	*Cardinalis cardinalis*	MTC

* Non-native species

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

MAMMALS

Didelphids

Virginia Opossum	*Didelphis virginiana*	MTC

Edentates

Nine-banded Armadillo	*Dasypus novemcinctus* *	MTC

Lagomorphs

Eastern Cottontail	*Sylvilagus floridanus*	MTC

Rodents

Beaver	*Castor canadensis*	SRST, BST
Southeastern Pocket Gopher	*Geomys pinetis*	SH, UC
Eastern Gray Squirrel	*Sciurus carolinensis*	MTC

Carnivores

River Otter	*Lutra canadensis*	SRST, BST
Raccoon	*Procyon lotor*	MTC

Manatees

West Indian Manatee	*Trichechus manatus*	SRST

Artiodactyls

White-tailed Deer	*Odocoileus virginianus*	MTC
Feral Hog	*Sus scrofa* *	MTC

* Non-native species

THIS PAGE INTENTIONALLY LEFT BLANK

Appendix 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.

Appendix 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.

THIS PAGE INTENTIONALLY LEFT BLANK

Appendix 8 —Local Government Comprehensive Plan Compliance

Appendix 9 — Visitor Use Management

Gilchrist Blue Springs State Park

VISITOR USE MANAGEMENT

INTRODUCTION

The mission of the Division of Recreation and Parks (DRP) seeks to maintain a balance between recreational use and resource management and protection. The inherent challenge in achieving this mission is highlighted by growing public concern over potential resource management impacts from popular recreational activities at some Florida State Parks. New research concerning visitor use management addresses the dynamic nature of visitor use, changing visitor preferences, and the importance of protecting the unique natural resources found within conservation lands. DRP completed research into alternative visitor management strategies and a new visitor use management strategy was developed. This new visitor use management strategy is intended to provide the greatest visitor capacity possible while sustaining natural and cultural resources and maintaining a quality visitor experience.

BACKGROUND

Previous DRP carrying capacity guidelines were based on the suitability of the resource, the type of recreational activity, the size of the resource available for that activity and a visitor's perception of crowding. Using this information, an approximate number of visitors per activity was identified in the unit management plan. Carrying capacity numbers for activities at some parks were also based on a facility capacity (i.e. the number of parking spaces) and the current guidelines do not rely on any ecological indicators or variables. Any previous carrying capacity developed for DRP management plans was a general estimate of the total visitor capacity possible.

The Florida State Park System highlighted the importance of a park visitor capacity in the early 1970s, however, the use of visitor capacities for parks or other managed areas has been around since the 1930s. The concept of a numerical carrying capacity for visitors was originally borrowed from the biological sciences, particularly in wild habitat applications. Yet, adapting the concept of carrying capacity to visitor use limits requires some problematic assumptions. Most notably, establishing numerical carrying capacities, assumes that there is a direct correlation between the amount of use and the amount of impact and that a simple cap on visitors will reduce resource impacts to acceptable levels. Research also indicates that visitor behavior, not the number of visitors, is the primary cause of resource impacts and therefore limiting the numbers of visitors is unlikely to address resource impacts caused by visitor behavior. (McCool *et al.* 2007)

Federal land management agencies consider the number of visitors in area as only one tool within a suite of strategies that can be used to protect a park's natural resources and visitor experience and appropriate visitor use management should be rooted to the specific purpose and management objectives of the conservation area. (IVUCM 2016)

Management by Objective (MBO) Frameworks

This shift in understanding resulted in the development of management by objectives (MBO) frameworks to guide recreation planning (Miller *et al.* 2017). MBO Frameworks provide a systematic process of acquiring the information needed to solve potential issues pertaining to visitor use. An MBO framework can provide a defensible, transparent decision-making process that ensures agency accountability and provides a sound

rationale upon which to base management decisions and actions (IVUMC 2016). An MBO framework once established can also empower resource managers to address issues proactively (Cahill *et al.* 2018).

There are three basic steps in an MBO framework:

- Establishing management objectives and associated indicators of quality.
- Monitoring the indicators of quality.
- Implementing management practices to maintain standards of quality.

Examples of such frameworks include Limits of Acceptable Change (LAC) used by the US Forest Service and Visitor Experience and Resource Protection (VERP) used by the National Park Service. MBO-type frameworks can also be found in management plans for national parks in Australia and Canada, and for several other state park systems.

The Visitor Use Management (VUM) Framework

In 2016, six federal agencies represented by the Interagency Visitor Use Management Council (IVUMC) developed the Visitor Use Management (VUM) framework. The VUM framework is designed to be compatible with both LAC and VERP and is now used for visitor use management decisions by all member agencies for federal lands and waters.

The VUM framework outlines four key steps:

- Build the Foundation - Clarify the project and need, review the park purpose and summarize current conditions and existing information.
- Define the Visitor Use Management Direction – Define the desired conditions and identify indicators and thresholds needed to monitor resource conditions.
- Identify Management Strategies – Identify strategies to manage visitor use and achieve the desired conditions. Develop a monitoring strategy.
- Implement, Monitor, Evaluate, and Adjust – Implement management strategies and adjust based on monitoring and evaluation.

The elements of the VUM framework are designed to be iterative in nature, where a systematic repetition of these steps aims to achieve a given result. It is a process where different data are tested until the desired result is obtained. The VUM framework can be applied across a wide spectrum of visitor use management issues that vary in extent and complexity, ranging from site-specific decisions to large-scale, comprehensive management plans (Cahill *et al.* 2018).

APPLICATION

Visitor Use Management for Gilchrist Blue Springs State Park

Instead of the standard recreational carrying capacity table, a site-specific VUM framework was developed for visitor use management at Gilchrist Blue Springs State Park. The steps in this process are outlined in Table 1. Existing elements of the DRP management plan process were adapted to the VUM framework originally developed by the IVUMC. For example, UMPs already document and assess current resource conditions, identify desired future resource conditions and establish the park's specific purpose and unique features of significance.

Table 1. Key Steps in the Development of the Visitor Use Management Strategy for Gilchrist Blue Springs State Park	
Build the Foundation	• Receive public input on resource conditions and recreational issues through a preliminary public workshop(s). • Work with key stakeholders through a preliminary advisory group meeting to identify potential management challenges and receive input on the park's purpose and significance statement. • Develop Draft Purpose and Significance Statement per established guidelines in consultation with management plan. team (Park Manager, RMC Author, Planner, and District Chiefs). • Use Resource Management Component to inventory and assess current resource conditions and identify potential recreational management issues.
Define the Visitor Use Management Strategy	• Develop and outline a site-specific strategy within the Land Use Component that includes: ➢ identification of specific recreational impacts from current or proposed recreational activities. ➢ identification of the resource indicators and associated thresholds for management action related to visitor use impacts and desired resource conditions. ➢ identification of management strategies to address these issues. • Review strategy internally through Division Review Process. • Review strategy externally with the public and key stakeholders as part of UMP public workshop and advisory group process. • Refine as necessary.
Implementation	• Conduct monitoring of indicators and standards and document results. • Evaluate effectiveness of management strategies indicators and standards, adjust as needed involving stakeholders in the process. • Repeat steps 2 and 3 as necessary. • Document monitoring, analysis and decision-making.

To build the foundation for the Gilchrist Blue Springs VUM strategy, a full scope of potential recreation and resource management issues was reviewed and analyzed. Preliminary survey work identified areas of the park where recreational impacts may be affecting resource conditions. Public feedback was also solicited on resource impacts, management priorities and potential recreational uses. Members of the appointed advisory group were involved in the identification of the park's purpose and significance through a serious of workshop exercises. This public input, coupled with internal staff meetings and analysis, identified common concerns among the public and DRP staff and defined an overall scope for the visitor use management strategy. The intent of the scoping process was to avoid biased thinking and potential assumptions by relying on multiple

sources of input, including public workshops, staff planning meetings and group consensus (Monz and Leung 2006).

Selection of the resource indicators and standards to monitor visitor use required careful analysis of potential recreational activities and any associated resource impacts. For example, swimming, wading, and snorkeling within the spring will result in visitors' feet or fins frequently contact the sandy spring bottom. Therefore, meaningful indicators associated with these activities were related to turbid water and the uprooting of submerged aquatic vegetation.

There was a distinct need to separate off-site impacts from visitor use impacts. For Gilchrist Blue Spring, a known stressor like nitrate pollution is more likely related to off-site impacts and therefore was not considered a reliable indicator of recreational impact. Additionally, careful consideration of the desired resource conditions required establishing a series of spring recreation zones. Finally, the ability to complete the necessary monitoring had to be evaluated. Other demands on staff time, as well as monitoring already being conducted by agency partners, influenced the selection of the proposed indicators and standards.

To prevent unnecessary disruption to the existing recreational uses at the park, a series of progressive management strategies are identified. In general, proposed management strategies fall into four categories, restoration, improved facility or access design, education and public outreach, and finally if those efforts fail, limits on recreational use. The implementation of management strategies will rely on the iterative nature of the VUM framework. As management strategies fail to address resource impacts, DRP staff will need to reassess resource conditions, evaluate indicators and standards, and potentially develop new management strategies all in perpetual feedback loop. As the VUM framework is applied, all issues should be assessed against a sliding scale of analysis that considers issue complexity, impact risk, the need for stakeholder involvement, and the level of controversy (Cahill *et al.* 2018).

CONCLUSIONS

The intent of this effort is to develop a new visitor use management strategy and determine its applicability to the broader Florida State Park system. Research and development do indicate the potential of multiple advantages:

- Provides a sound rationale upon which to base visitor use management decisions and actions.
- Adapts to existing elements of the DRP management plan process.
- Applies to all parks, from small parks with low levels of visitor use, to large parks with high attendance and complex visitor use management issues.
- Applies to a wide range of visitor use management issues.
- Addresses visitor use issues quickly before they become even more problematic.
- Consistent with current recreational management research on effective strategies to manage potential visitor use impacts.

This proposed strategy is not without its challenges. The required commitment to monitoring must not be taken lightly. DRP is regularly engaged in monitoring activities for a wide range of resource management activities; however, this new strategy requires specific monitoring and documentation related to potential recreational impacts. Such monitoring is not a formal component of park operations at most parks. This could add additional workload to an already busy and limited staff. Future planning teams should carefully considered this challenge and discuss monitoring that could be accomplished by a ranger, as part of regular work duties, or park

volunteers. Monitoring already being conducted by other agencies or institutions as part of their research or regulatory efforts might also be used.

The primary challenges of this new visitor use management strategy include:

- Requires absolute commitment to the monitoring of resource conditions and visitor experience or the agency risks resource damage and losing the public trust.
- Requires a potential shift in some resource management activities and park operations.

A level of uncertainty and risk will always be associated with the issues concerning visitor use management. In the development of this visitor use management strategy DRP has relied on professional judgement and the best available research. Regardless of the selected approach, all decisions regarding visitor use should be well-documented with analysis and an administrative record that supports decision-making. Information on any visitor use management actions, related monitoring and any proposed changes to visitor use patterns should always be shared with the public.

REFERENCES CITED

Cahill, Kerri; Rachel Collins, Susan McPartland, Aleksandra Pitt, and R. Verbos, 2018 "Overview of the Interagency Visitor Use Management Framework and the Uses of Social Science in its Implementation in the National Park Service." The George Wright Forum, vol. 35, no. 1, pp. 32–41 (2018).

IVUMC [Interagency Visitor Use Management Council]. 2016. Visitor Use Management Framework: A Guide to Providing Sustainable Outdoor Recreation, Edition One. N.P.: IVUMC https://visitorusemanagement.nps.gov/VUM/Framework

McCool, Stephen F.; Clark, Roger N.; Stankey, George, H. 2007. "An assessment of frameworks useful for public land recreation planning." Gen. Tech Rep. PNW-GTR-705. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station. 125 p.

Miller, Zachary D.; Fefer, Jessica P. ; Kraja, Arben; Lash, Benjamin and Freimund, Wayne. 2017. "Perspectives on Visitor Use Management in the National Parks." The George Wright Forum, vol. 34, no. 1, pp. 37–44 .

Monz, Christophe and Leung, Yu-Fai 2006. "Meaningful Measures: Developing Indicators of Visitor Impact in the National Park Service Inventory and Monitoring Program" The George Wright Forum, vol. 23, no. 2, pp. 17–27.

THIS PAGE INTENTIONALLY LEFT BLANK