Fanning Springs State Park

Approved
Unit Management Plan

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL PROTECTION

Division of Recreation and Parks
February 17, 2017

Florida Department of Environmental Protection

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

Rick Scott
Governor

Carlos Lopez-Cantera
Lt. Governor

Ryan E. Matthews
Interim Secretary

February 17, 2017

Ms. Sine Murray
Division of Recreation and Parks
Department of Environmental Protection
3900 Commonwealth Boulevard, MS 525
Tallahassee, Florida 32399-3000

RE: Fanning Springs State Park - Lease #4142

Dear Ms. Murray:

On **February 17, 2017**, the Acquisition and Restoration Council recommended approval of the **Fanning Springs State Park** management plan. Therefore, the Division of State Lands, Office of Environmental Services, acting as agent for the Board of Trustees of the Internal Improvement Trust Fund, hereby approves the **Fanning Springs State Park** management plan. The next management plan update is due February 17, 2027.

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

Sincerely,

Raymond V. Spaulding
Office of Environmental Services
Division of State Lands
Department of Environmental Protection

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INTRODUCTION

Fanning Springs State Park is located in Levy County in the town of Fanning Springs on the Suwannee River (see Vicinity Map). Access to the park is from U.S. Highway 19/98 (see Reference Map). The Vicinity Map also reflects significant land and water resources existing near the park.

Fanning Springs State Park was initially acquired December 3, 1993 with funds from the Conservation and Recreation Lands (CARL) program. Currently, the park comprises 198.37 acres. The Board of Trustees of the Internal Improvement Trust Fund (Trustees) hold fee simple title to the park and on March 10, 1997, the Trustees leased (Lease Number 4142) the property to DRP under a fifty-year lease. The current lease will expire on March 9, 2047.

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

Purpose and Significance of the Park

The purpose of Fanning Springs State Park is to conserve and protect the natural value of Fanning Springs for the benefit of the people of Florida. The park was acquired to protect the water quality of these first and second magnitude springs and to provide Floridians and visitors with opportunities for exceptional public resource-based outdoor recreation.

Park Significance

- Fanning Springs State Park is significant as a unit of the state park system due to Fanning Springs and Little Fanning Springs, first and second magnitude springs respectively, and the Suwannee River, an Outstanding Florida Water. Approximately two-thirds of a mile of Suwannee River shoreline is contained within the park.

- Nine natural communities exist within the park providing important habitat for a variety of imperiled species. The springs and river provide habitat for the West Indian manatee, gulf sturgeon, and Suwannee cooter while the uplands support gopher tortoise.

- The park contains an abundance of archaeological sites, representing periods of Florida's prehistory and history from Paleo-Indian, the Seminole Wars, the Civil War, to agricultural and recreational activities during the late 19th and early 20th century.

- The park serves as a recreational hub for residents, visitors and users of the Suwannee River Wilderness Trail and the Nature Coast State Trail. It provides exceptional opportunities for swimming, picnicking, boating, cabin lodging, primitive camping, and wildlife viewing.

Fanning Springs State Park is classified as a state recreation area in the DRP's unit classification system. In the management of a state recreation area, major emphasis is placed on maximizing the recreational potential of the unit. However, preservation of the park's natural and cultural resources remains important. Depletion of a resource by any recreational activity is not permitted. In order to realize the park's recreational potential, the development of appropriate park facilities is undertaken with the goal to provide facilities that are accessible, convenient and safe, to support public recreational use or appreciation of the park's natural, aesthetic and educational attributes.

Purpose and Scope of the Plan

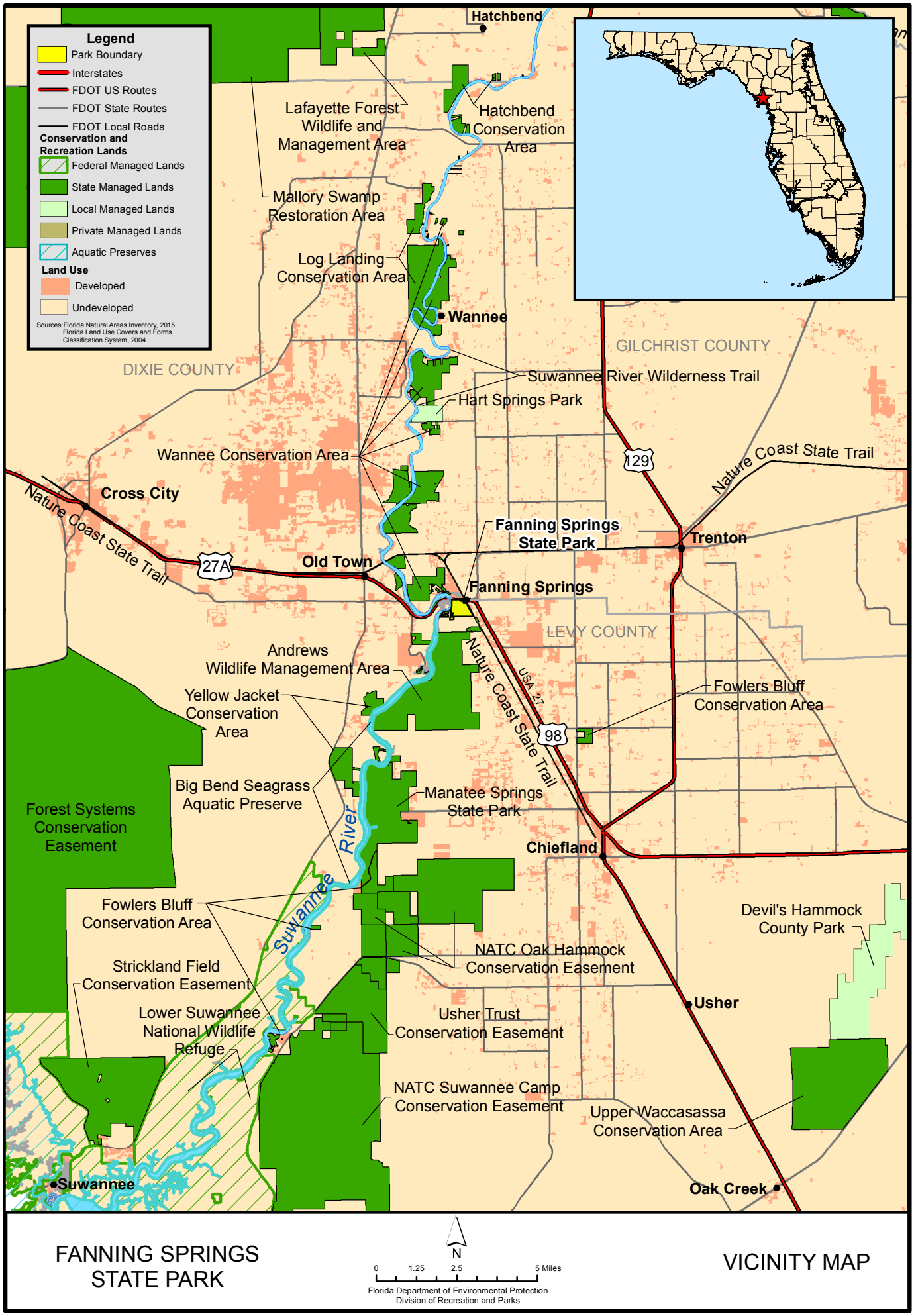
This plan serves as the basic statement of policy and direction for the management of Fanning Springs State Park as a unit of Florida's state park system. It identifies the goals, objectives, actions and criteria or standards that guide each aspect of park administration, and sets forth the specific measures that will be implemented to meet management objectives and provide balanced public utilization. The plan is intended to meet the requirements of Sections 253.034 and 259.032, Florida Statutes, Chapter 18-2, Florida Administrative Code, and is intended to be consistent with the State Lands Management Plan. With approval, this management plan will replace the 2003 approved 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, current public uses and existing development. Measurable objectives are set to achieve the desired allocation of the physical space of the park. These objectives identify use areas and propose the types of facilities and programs as well as the volume of public use to be provided.

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


Legend
Park Boundary
Interstates
FDOT US Routes
FDOT State Routes
FDOT Local Roads
Conservation and Recreation Lands
Federal Managed Lands
State Managed Lands
Local Managed Lands
Private Managed Lands
Aquatic Preserves
Land Use
Developed
Undeveloped
Sources: Florida Natural Areas Inventory, 2015
Florida Land Use Covers and Forms Classification System, 2004
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Hatchbend Conservation Area
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Log Landing Conservation Area
Wannee
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GILCHRIST COUNTY
Suwannee River Wilderness Trail
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Fowlers Bluff Conservation Area
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Big Bend Seagrass Aquatic Preserve
Manatee Springs State Park
Forest Systems Conservation Easement
River
Chiefland
Suwannee
Fowlers Bluff Conservation Area
Devil's Hammock County Park
NATC Oak Hammock Conservation Easement
Strickland Field Conservation Easement
Usher
Lower Suwannee National Wildlife Refuge
Usher Trust Conservation Easement
NATC Suwannee Camp Conservation Easement
Upper Waccasassa Conservation Area
Suwannee
Oak Creek
FANNING SPRINGS STATE PARK
N
0
1.25
2.5
5 Miles
Florida Department of Environmental Protection
Division of Recreation and Parks
VICINITY MAP

FANNING SPRINGS STATE PARK

N

0 250 500 1,000 Feet

Florida Department of Environmental Protection
Division of Recreation and Parks
Date of aerial; 2014

REFERENCE MAP

instruments. Approval of the management plan does not constitute an exemption from complying with the appropriate local, state or federal agencies.

In the development of this plan, the potential of the park to accommodate secondary management purposes was analyzed. These secondary purposes were considered within the context of the DRP's statutory responsibilities and the resource needs and values of the park. This analysis considered the park natural and cultural resources, management needs, aesthetic values, visitation and visitor experiences. For this park, it was determined that no secondary purposes could be accommodated in a manner that would not interfere with the primary purpose of resource-based outdoor recreation and conservation. Uses such as water resource development projects, water supply projects, stormwater management projects, linear facilities and sustainable agriculture and forestry (other than those forest management activities specifically identified in this plan) are not consistent with this plan.

The potential for generating revenue to enhance management was also analyzed. Visitor fees and charges are the principal source of revenue generated by the park. It was determined that multiple-use management activities would not be appropriate as a means of generating revenues for land management. Instead, techniques such as entrance fees, concessions and similar measures will be employed on a case-by-case basis as a means of supplementing park management funding.

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 Visitor Service Provider (VSP) may provide services to park visitors in order to enhance the visitor experience. For example, a VSP could be authorized to sell merchandise and food and to rent recreational equipment for use in the park. A VSP 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 VSPs, etc. are made on a case-by-case basis in accordance with the policies set forth in DRP's Operations Manual (OM).

Management Program Overview

Management Authority and Responsibility

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

It shall be the policy of the Division of Recreation and Parks to promote the state park system for the use, enjoyment, and benefit of the people of Florida and visitors; to acquire typical portions of the original domain of the state which will be

accessible to all of the people, and of such character as to emblemize the state's natural values; conserve these natural values for all time; administer the development, use and maintenance of these lands and render such public service in so doing, in such a manner as to enable the people of Florida and visitors to enjoy these values without depleting them; to contribute materially to the development of a strong mental, moral, and physical fiber in the people; to provide for perpetual preservation of historic sites and memorials of statewide significance and interpretation of their history to the people; to contribute to the tourist appeal of Florida.

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

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

Park Management Goals

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

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

Management Coordination

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

The Florida Department of Agriculture and Consumer Services (FDACS), Florida Forest Service (FFS), assists DRP staff in the development of wildfire emergency plans and provides the authorization required for prescribed burning. The Florida Fish and Wildlife Conservation Commission (FWC) assists staff in the enforcement of state laws pertaining to wildlife, freshwater fish and other aquatic life existing within the park. In addition, the FWC aids DRP with wildlife management programs, including imperiled species management. The Florida Department of State (FDOS), Division of Historical Resources (DHR) assists staff to ensure protection of archaeological and historical sites. The Florida Department of Environmental Protection (FFDEP), Florida Coastal Office (FCO) aids staff in aquatic preserve management programs.

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 August 17 and 18, 2016, respectively. Meeting notices were published in the Florida Administrative Register, [August 5, 2016, VOL 42/152], included on the FDEPartment Internet Calendar, posted in clear view at the park, and promoted locally. The purpose of the Advisory Group meeting is to provide the Advisory Group members an opportunity to discuss the draft management plan (see Addendum 2).

Other Designations

Fanning Springs State Park is not within an Area of Critical State Concern as defined in Section 380.05, Florida Statutes, and is not presently under study for such designation. The park is designated through the Office of Greenways and Trails as a component of the Florida Greenways and Trails System.

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 FDEP. This park is adjacent to the Big Bend Seagrasses 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 (FDEP), 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 FDEP's overall mission in ecosystem management. Cited references are contained in Addendum 3.

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 park values.

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

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

The entire park is divided into management zones 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.

Table 1: Fanning Springs State Park Management Zones		
Management Zone	**Acreage**	**Managed with Prescribed Fire**
FS-1A	19.8	Y
FS-1B	22.46	Y
FS-1C	21.05	Y
FS-1D	44.04	N
FS-2A	28.22	Y
FS-2B	37.81	Y
FS-2C	5.72	Y
FS-2D	8.85	N
FS-2E	8.69	N

Resource Description and Assessment

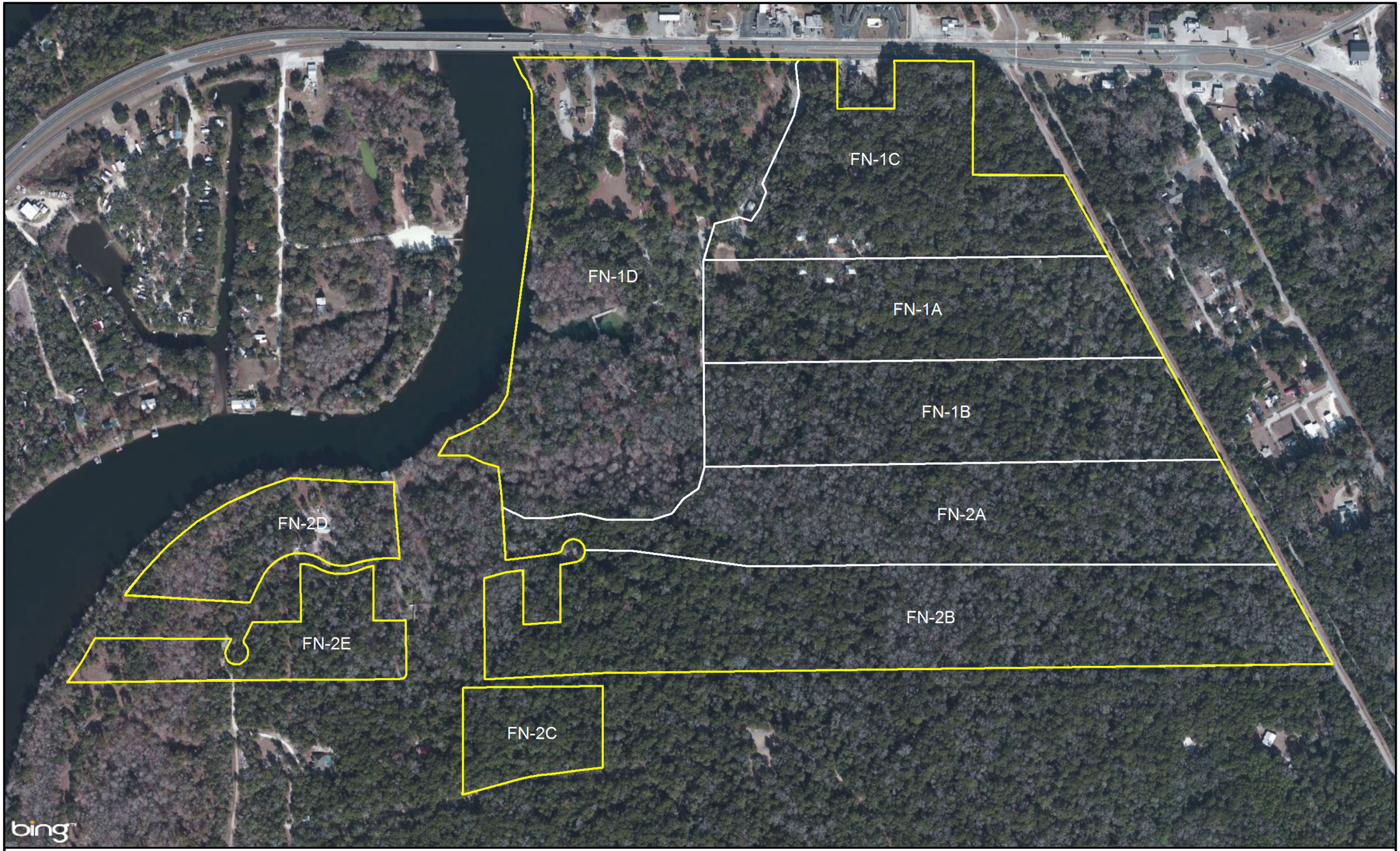
Natural Resources

Topography

Fanning Springs State Park lies within the Gulf Coastal Lowlands, a physiographic division of the Northern Geomorphic Zone of Florida. Characteristic features of the Gulf Coastal Lowlands include Pleistocene era marine terraces of variable thickness, limestone exposures, and remarkable karst topography (Fernald and Purdum 1998). Stream valleys that cut through the lowlands contain alluvial deposits formed during the late Pleistocene. Tertiary age limestone may be exposed along the stream channels. Lower reaches of the valleys probably have been entrenched in limestone bedrock since the last significant rise in sea level. Further from the river, the lowlands mature into a karst plain heavily laden with numerous large sinkholes that capture and rapidly transport surface runoff directly into the Upper Floridan aquifer.

Two geomorphic zones located just east of the Gulf Coastal Lowlands, namely Bell Ridge and Waccasassa Flats, are both of some importance to the Fanning Springshed, a description of which appears in the Hydrology section below. Waccasassa Flats is a high elevation plateau with low permeability, a characteristic that gives rise to numerous wetlands and streams whose waters flow westward off the flats, often funneling into the Upper Floridan through numerous small swallets. Bell Ridge is a Pleistocene-age beach ridge consisting of sandy overburden underlain with clastic Miocene sediments (Puri and Vernon 1964), with an elevation of about 70 feet above mean sea level (msl) and with very little surface drainage.

Fanning Springs State Park is situated on the Pamlico Terrace, which is of Pleistocene origin. Topographic relief within the park is slight and slopes are gradual. Elevations range from less than five feet msl in the floodplain swamp along the Suwannee River to a maximum of about 32 feet msl at the eastern boundary of the park. The park contains numerous karst features including springs, limestone outcrops, solution pipes and sinkholes.



FANNING SPRINGS STATE PARK

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

MANAGEMENT ZONES MAP

FANNING SPRINGS STATE PARK

0 200 400 800 Feet

Florida Department of Environmental Protection
Division of Recreation and Parks
DEM Courtesy of USGS

TOPOGRAPHIC MAP

Prior to state acquisition of Fanning Springs in 1993, the natural terrain on the property had experienced numerous alterations. The steep slopes above the main spring and spring run had become seriously eroded due to intense recreational use, which eventually caused an unnaturally high accumulation of sediments within the spring and spring–run stream. Significant topographic alterations had also occurred near the second major spring on the property, Little Fanning Spring, in the form of limestone excavations at two different sites. One of the sites, a pit approximately 20 feet deep and 15 feet wide, lies immediately above Little Fanning. The other site, located west of the Little Fanning headspring and north of its spring run, consists of a series of pits as deep as the previously described one but covering a much larger area. Apparently, the pits were dug during the Civil War period to extract a low grade of iron ore from the limestone. Refinement of this "bog iron" took place at an offsite location.

Alterations of natural topography also took place in an area south of Little Fanning Spring where several small home sites had been cleared on the primary levee of the Suwannee River before the state acquired portions of the property. To provide reliable access to the sites, developers had to construct several short causeways across floodways of the Suwannee River. Other intrusions included raised drain fields, underground electrical cables, and at least three aboveground electrical service panels. Several small culverts provided for limited drainage through the causeways. Nevertheless, causeway fill materials and other infrastructure elements continue to modify surface hydrology within the floodway. Less obvious topographic disturbances in the park exist in the form of roads and firebreaks, a few of which are now obsolete.

Geology

Listed in descending order of age, underlying deposits in the region include the Pamlico deposits, Ocala Limestone, Avon Park Limestone, Lake City Limestone, Oldsmar Limestone, and Cedar Keys Limestone. Suwannee Limestone, of Oligocene age, typically overlies the Ocala Limestone, but it is absent in Levy County (Slabaugh et al. 1996).

The Pamlico Terrace, the most diversified of the Pleistocene deposits laid down when sea levels fluctuated in response to successive glaciations, consists of irregular patches of sand or sandy clay alluvium, brackish water clay or sand and marl; pasty, sandy, non-fossiliferous limestone presumed to be a bay deposit; and sandy, coquina marl and marl sands that are locally dolomitized. The thickness of the terrace varies with the degree of erosion to which it has been subjected.

The Ocala Limestone, of Eocene age, is next in sequence. Outcrops of this deposit are visible about the main spring. Three limestone formations make up the Ocala; from youngest to oldest, these are the Crystal River, Williston, and Inglis Formations.

The Crystal River Formation is typically white to cream in color and consists of a soft, massive, friable coquina set in a pasty calcite matrix. It may reach a thickness

of 125 feet. The Williston Formation comprises two variations of a commonly silicified, fossiliferous marine limestone. One type is essentially a cream-colored coquina while the other is a cream to tan, detrital limestone. This formation averages 30 feet in thickness. The Inglis Formation is a cream to tan, granular, rarely pasty, porous, very hard, massive, and shallow-water marine limestone having a plentiful fauna, in part a coquina. The base is dolomitized, the dolomite being tan to brown, highly porous but only slightly permeable. This formation averages 50 feet in thickness (Crane 1986).

Below the Ocala Limestone lies the Avon Park Limestone, also of Eocene age. In Levy County, this limestone is variable in lithology. Three variations are found, all having a distinct fossiliferous fauna and a high content of lignitic and other carbonaceous plant residues. Any of them may be irregularly or completely dolomitized. One variation is a cream to brown, highly fossiliferous, fragmental to pasty, marine limestone that weathers to white and purple-tinted hues. Another is a cream to brown, very fossiliferous, pasty and fragmental, peat-flecked and seamed, marine limestone. The last is a tan to brown, thin-bedded and laminated, finely crystalline, marine dolomite, intermingled with layers of lignite and carbonaceous plant remains. The Avon Park Limestone can reach a thickness of at least 300 feet.

Below the Avon Park formation is Lake City Limestone. In Levy County, the composition of this deposit varies. In general, the formation consists of a tan to cream-colored, fragmental, often peat-flecked, granular and pasty limestone embedded with foraminifera, crystals of calcite and echinoid plates. Sometimes the limestone is a coquina. Gypsum may be present, so much so that fossils appear to be embedded in the mineral. Thin beds and seams of anhydrite and selenite may also be present. Dolomitization occurs in varying degrees. Finally, concentrated in the upper portions but found throughout, are pseudo-oolite beds; a brown to coffee-colored chert; an oftentimes silicaceous clay; and a brownish-gray, laminated, finely crystalline dolomite with carbonaceous and perhaps fossiliferous seams. This deposit measures from 575 to 900 feet in thickness.

The deepest deposit of Eocene age is Oldsmar Limestone, a brown, porous, friable, granular limestone of calcite grains loosely embedded in a limestone paste and intermingled with brown, coarsely crystalline, sugary, porous dolomite having seams of white chert and anhydrite; coffee-colored chert; and finely crystalline, tan to brown dolomite. The base is commonly a brown, granular, porous, foraminiferous coquina in a soft limestone paste. This formation varies from just under 400 feet to slightly over 550 feet in thickness.

The Cedar Keys Limestone, of Paleocene age, in this area is composed of intermingled tan to gray, granular, fragmental, often fossiliferous limestone and tan to brown, crystalline to chalky dolomite. Gypsum has impregnated large sections and may occur as thin lenses. The Cedar Keys formation is some 600 feet thick (Crane 1986).

As mentioned above, surficial limestone was once excavated to a depth of less than 20 feet from two sites in the park. Otherwise, no significant alterations of the park's geological formations appear to have taken place.

Soils

Four soil types exist within Fanning Springs State Park (see Soils Map). Addendum 3 contains complete soils descriptions. The upland soils found in the park are generally well drained to excessively drained, whereas soils within the floodplain of the Suwannee River tend to be poorly drained. The Levy County soil survey characterizes most of the soils found within the park as very deep, except for the Seaboard soils in the Jonesville-Otela-Seaboard complex. In these soils, limestone underlies the sand at a relatively shallow depth (Slabaugh et al. 1996).

Limestone outcrops are frequent in the area south of Fanning Spring and north of the Little Fanning Spring-run. As previously mentioned, these outcrops are probably associated with a period of small-scale limestone mining at the site. Soils overlying the outcrops are thin or nonexistent, suggesting that either they were removed during the mining process or that they were never present there.

Before the state assumed management of Fanning Spring, heavy recreational use of the headspring had caused extensive erosion on the steep banks above the feature, resulting in an unnaturally large buildup of sediments in the spring and spring run. Frequent disturbance of the sediments by swimmers exacerbated the situation by encouraging sediment migration into the spring vent itself. Once the state acquired the property, mitigation of the erosion and sedimentation issues at the headspring began. Projects designed to reduce erosion, particularly in the day use area east of the headspring, included construction of a system of terraces on slopes above the spring, re-vegetation of the slopes, and installation of concrete walkways and wooden boardwalks that provided structured access to the spring. The sediment buildup in the spring itself was addressed through the dredging of accumulated sands.

The dredging of Fanning Spring took place in two separate projects, in 2002 and 2011. FDEP and the Suwannee River Water Management District (SRWMD) jointly funded the 2002 project. The 2011 Fanning Springs Sediment Removal & Dock Modification project was sponsored by multiple agencies including FWC, United States Fish and Wildlife Service (USFWS), SRWMD, The Nature Conservancy (TNC), and FDEP. The various agencies cooperated in a restoration dredge designed to remove excess sediments from the spring and spring run, restore the spring’s natural contours and depths, and ensure open access to the spring bowl for West Indian manatees (*Trichechus manatus*) and other wildlife at all river stages.

Prior to commencement of each project, extensive geological and archaeological soil analyses were conducted in order to accurately determine historic sediment depths. During both projects, expert divers used hand-held suction devices to remove a total of nearly 1000 cubic yards (cy) of sand and debris from the system (i.e., > 400 cy in 2002 and > 500 cy in 2010). Disturbance of the spring-run stream

community was minimal using this device, especially during the 2011 project, given that there were no intact beds of submerged aquatic vegetation (SAV) present within the entire spring system at the time of either dredge.

The DRP also implemented a floating buoy system at Fanning Spring that better defined the limits of the public swimming area in order to distinguish it from areas of ecologically sensitive shoreline where severe erosion was still taking place. As of 2012, protected shorelines were the only locations within Fanning Spring and its spring run that still harbored remnant populations of SAV. Additional protective measures for Fanning Spring included construction of a boardwalk and platform system through the swamp along the north edge of the spring run west to the Suwannee River and installation of a large “L-shaped” floating dock along the north side of the spring run to accommodate swimmers and sunbathers. These measures helped reduce recreational impacts while improving public access to the Suwannee River and the headspring.

One erosion issue that remains unresolved is the canoe launch site on the Suwannee River just north of the spring run. Historically, a partially paved road connected the canoe launch with a large open field to the northeast at the top of a steep slope. Most of the crumbling asphalt debris along the road has since been removed and native vegetation has been planted in the road trace. Those efforts have partially succeeded in reducing soil erosion on the slope. However, there is still a need to establish an alternative, well-stabilized pathway there that will provide canoeists with safe reliable access to the launch from uplands in the park. Any design changes that are proposed for the canoe launch and its access route should take into consideration the extreme fluctuations in river stage that occur frequently along the Suwannee.

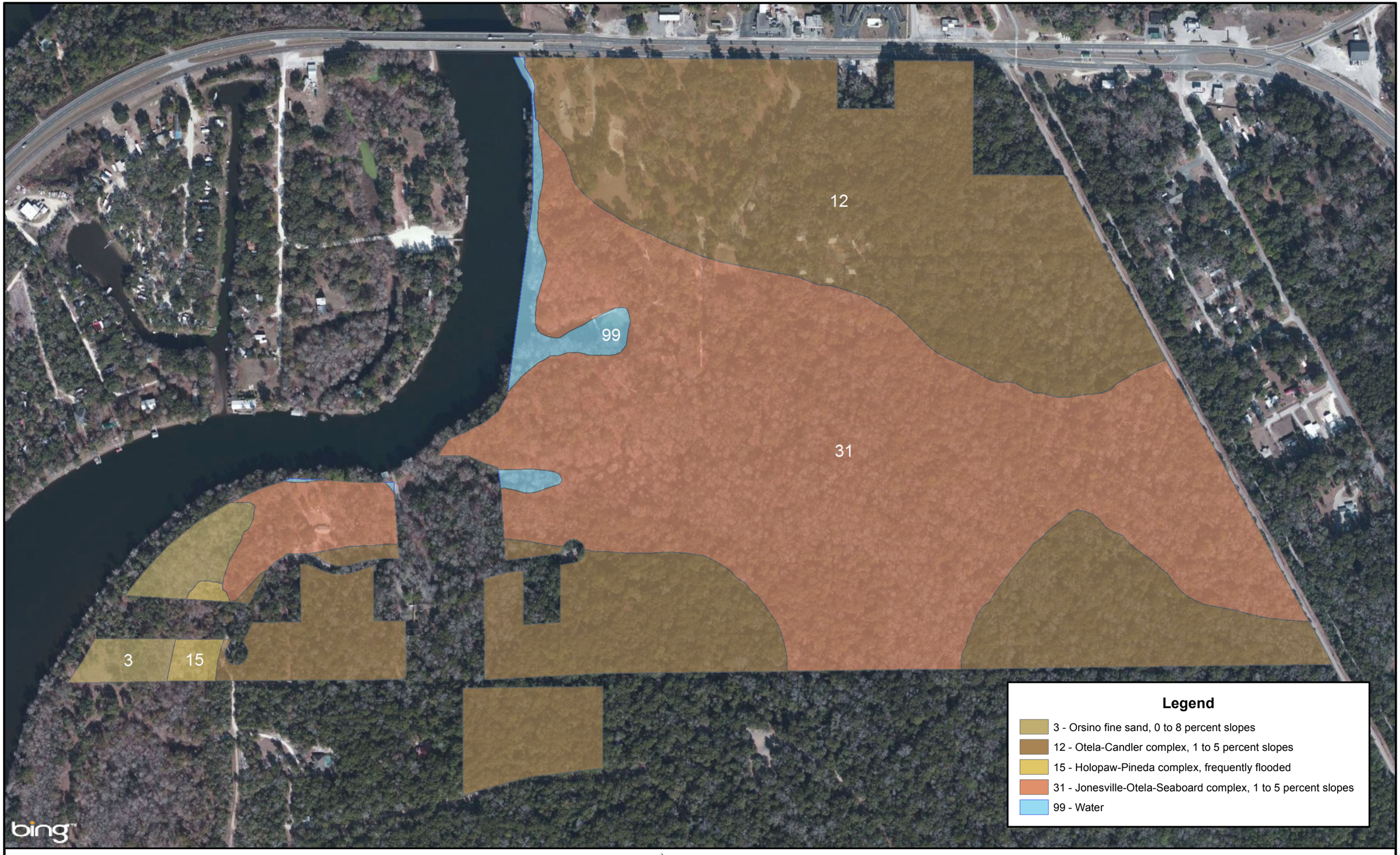
An additional area of erosion worthy of mention is along the spring run of Little Fanning, where rooting by feral hogs has at times caused significant damage in the alluvial forest. Other areas of concern where there is a potential for undesirable erosion, sedimentation, and runoff include roads, firebreaks, and the visitor use area above the main headspring. Park and district staffs will monitor these areas carefully and follow generally accepted best management practices to prevent soil erosion and to conserve soil and water resources on site.

Minerals

Historically, limited removal of bog iron limestone took place along the northern edges of Little Fanning Spring and just north of its spring run. Whether mineral deposits of commercial value occur in the park is unknown.

Hydrology

Fanning Springs State Park is located in northwestern Levy County within the fourth reach of the Lower Suwannee River Basin (SRWMD 2005). This basin occupies an



FANNING SPRINGS STATE PARK

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0 200 400 800 Feet

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

SOILS MAP

area of about 700 square miles, encompassing nearly seven percent of the entire Suwannee watershed (SRWMD 2006). As a whole, the Suwannee Basin drains approximately 10,000 square miles of the Florida/Georgia region and ultimately discharges into the Gulf of Mexico about 40 miles southwest of the park through Florida's largest publicly managed estuary, Big Bend Seagrasses Aquatic Preserve (FDEP 2012a).

The Suwannee River, Fanning Spring, and Little Fanning Spring are the three most prominent hydrological features in the park. The Suwannee's average flow is 7,100 million gallons per day (mgd). The river has been designated an Outstanding Florida Water (OFW) and is a Class III water body. Average annual rainfall for the lower Suwannee region approaches 60 inches a year (Fernald and Purdum 1998).

Water scientists have identified approximately 300 natural springs, including Fanning, within the Florida portion of the Suwannee River system (Harrington and Wang 2011). The large areas of exposed, unconfined karst aquifer that occur in the Middle and Lower Suwannee basins and along the Santa Fe River give rise to numerous individual springs that significantly augment the Suwannee's base flow. The springs are more abundant within the central region of the Suwannee than in any other area of the entire Suwannee Basin (Scott et al. 2004). In fact, during periods of low surface water flows, groundwater from the central region is the source of nearly all inflow to the Suwannee River (Pittman et al. 1997).

Fanning Springshed and its Major Springs

The two major spring vents in the park are located at Fanning, a first magnitude spring, and Little Fanning, a second magnitude spring. The main vent of Fanning Spring, located in the southeast portion of the headspring, is funnel-shaped and may be over 18 feet deep, depending on river stage. No known cave exploration has occurred at Fanning Spring because of the small size of the vent opening into the aquatic cave system. The Fanning Spring Run, which heads briefly northward before turning west to the Suwannee River, is approximately 450 feet long, 200 feet wide, and one to ten feet deep. There are multiple seeps and boils on the south side of the main vent pool. Just north of the headspring, a small seepage spring system drains from floodplain swamp/alluvial forest into the spring run. Little Fanning Spring is located approximately 500 feet south of Fanning Spring. It has a nearly horizontal opening into a previously disturbed limestone hillside, as described above in the Topography section. At least two separate small vents discharge at this spring. Little Fanning's spring run, which is 10 to 40 feet wide, flows approximately 1000 feet southwesterly to the Suwannee River.

Delineation of the Fanning Springshed began in the early 2000s with geostatistical analysis of groundwater wells scattered throughout its basin (Upchurch et al. 2005). Water managers now know a considerable amount about the surface water and groundwater basins that contribute to the overall discharge of the two major springs in the park (Scott et al. 2004; Upchurch and Champion 2004). However, it is important to realize that determining the exact size of the groundwater basin for the Fanning Springshed is complicated because of its proximity to the adjacent Manatee Springshed to the south. The groundwater divide between the two is not

distinct, so hydrologists often treat the Fanning and Manatee springsheds as one. At its greatest distance from east to west, the Fanning Springshed measures over 15 miles, whereas the Manatee Springshed measures nearly 18 miles. Together, the surface watersheds and groundwater basins that comprise the Fanning-Manatee Springshed encompass up to 450 square miles. Of that figure, approximately 250 square miles are considered of major importance to Fanning.

One unfortunate consequence of grouping the Fanning and Manatee springsheds as one unit is that this can perpetuate a misperception that flow properties of these two spring systems are the same. To the contrary, Fanning and its associated floodplain wetlands function ecologically as non-tidal wetlands, whereas tidal cycles significantly influence spring discharge and flooding of wetlands at Manatee (Light et al. 2002). While tides do influence Fanning, as will be discussed below, their effects are much reduced in comparison with Manatee.

One prominent feature that defines groundwater characteristics of Fanning Springs State Park is an unnamed transitional karst region situated between the Fanning Springshed and the Waccasassa Flats to the east (Upchurch et al. 2005). This karst plain behaves very much like areas along the Cody Scarp to the north, where high groundwater recharge directly into numerous large sinkholes is a prominent characteristic (Upchurch 2002). The Cody Scarp is an outfacing, relict marine feature that constitutes the most persistent topographic break in the state (White 1970). The many incidences of subsidence and sinkhole collapse that occur along the Cody Scarp are also a common feature in other transitional karst areas, strongly influencing hydrologic characteristics of the region (Upchurch and Champion 2002). In the Fanning Springshed, a large proportion of surface runoff, including that from Waccasassa Flats, drains across this unnamed transitional scarp, eventually disappearing into sinkholes and rapidly infiltrating the subsurface limestone conduits of the Upper Floridan aquifer (Upchurch and Champion 2004).

Groundwater within the Fanning-Manatee 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. Unlike Manatee Springs, however, no records of aquatic cave exploration exist for Fanning Springs, probably because historic alterations of the main spring vent had blocked entry to the system. Given the absence of data from cave exploration, a better understanding of the nature of the conduit connections within the Fanning 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). The only dye trace work completed in the Fanning-Manatee Springshed to date occurred in 2009. Dye placed in a sinkhole seven miles east in Chiefland appeared in less than six days at the Manatee headspring (Karst Environmental Sciences 2009). The dye trace work, in conjunction with cave mapping, supports the premise that surface runoff entering the Upper Floridan aquifer within the

Fanning-Manatee Springshed can travel through conduits as fast as 1.5 miles per day. Comparable studies, such as in the Ichetucknee Springshed, have demonstrated even faster travel times (Champion and Upchurch 2003). These and other dye trace studies 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; 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).

Water quantity

The U.S. Geological Survey (USGS) first measured discharge at Fanning Spring in 1930 and at Little Fanning Spring in 1972. In recent years, the USGS has worked with the SRWMD to track discharges (USGS 2012; SRWMD 2012). Daily discharge data for Fanning Spring's Station #02323502 are available from 2001 to present, but the actual period of record (POR) for data gathering, albeit only sporadic in nature, goes back to 1930. The average total discharge for this first magnitude spring from 1930 to 1998 (# of samples = 23) was 107.5 cubic feet per second (cfs); however, from 1999 to 2008 (# of samples=2428) the average dropped significantly to 73.5 cfs (Greenhalgh 2008; Copeland et al. 2011). If one includes all available data for the entire POR, however, the median daily discharge is 73 cfs (USGS 2012). The minimum instantaneous flow ever recorded for the spring was negative 108 cfs on April 10, 2003, while the maximum was 247 cfs on September 5, 2004 (USGS 2012). The negative velocities for minimum flow at Fanning Spring indicate potential flow reversals in this system (USGS 2012).

The POR for Little Fanning Spring, which extends from 1972 to 2012, is represented by only 21 sporadic discharge measurements. During that period, the average total discharge of this second magnitude spring was 10.1 cfs. The maximum instantaneous flow ever recorded was 29.9 cfs on April 25, 1972 (Rosenau 1977). At the other extreme, Little Fanning has completely stopped flowing numerous times for extended periods, sometimes for months. The park has also documented flow observations for this spring sporadically (Division of Recreation and Parks District 2 files).

Tidal fluctuation and flooding along the Suwannee River are two major factors that complicate the measurement of discharge at Fanning's two major springs. Either factor, whether individually or in combination with the other, can affect water quantity and quality at Fanning. The impact of tides and flooding on discharge is critical to the discussion about water quantity because they can significantly influence the velocity of groundwater flow.

Even though Fanning is located in a supposedly non-tidal portion of the Suwannee River, water scientists know that the river can indeed be tidal at the Wilcox gage immediately upstream of Fanning Spring when flows are low. Typical tidal range at the gage is about 30 cm at low flow and 15 cm at median flow. Tides do not influence flow measurements at this gage when river flows are high or during

significant flood events (Light et al. 2002). When the Suwannee is experiencing periods of low flow, falling tides have little effect on the Fanning discharge and essentially allow springs to flow unconstrained. When tides are rising, however, they can affect the Fanning discharge by decreasing spring flow and increasing the odds of back-flooding in associated floodplain wetlands (Light et al. 2002). Back-flooding is especially important to the ecology of all Suwannee Basin floodplain communities (Pringle 1997; Diehl 2000; Garza and Mirti 2003).

Based on overall discharge, the Suwannee River is the second largest river in Florida (Berndt et al. 1998), and since there are no dams along its entire length, natural flood events are commonplace within the system (Garza and Mirti 2003). The likelihood of the Suwannee flooding is directly proportional to the amount of rainfall within its basin. Numerous gages along the Suwannee track both discharge and stage for the entire river (USGS 2012; Verdi et al. 2006). Typical high flows in the lower Suwannee River occur during March and April (Light et al. 2002).

When the Suwannee floods, the high river stage at spring tributaries such as Fanning gradually “pushes back” the head pressure in the Floridan aquifer. As the Suwannee back-floods into the Fanning Spring Run during high tides or upstream flooding, river and spring waters begin to mix (Katz et al. 1999). A helpful tool in documenting changes in groundwater discharge in spring systems is to monitor water clarity in springs (Anastasiou 2006; DRP, District 2 files). Depending on the clarity of the Suwannee River (i.e., tannic or clear) and on downstream tidal influences and river stage, marked changes in water clarity can be observed within the Fanning system. Partial or complete “brownouts” of the Fanning system may result. A complete brownout is considered to have occurred when tannic river water covers the entire headspring and spring run and water clarity is reduced to less than four feet of visibility. If the surface water pressure exceeds the groundwater head pressure, the springs at Fanning may even undergo a partial flow reversal and function as a “siphon” or inflow point into the Upper Floridan aquifer (Gulley et al. 2011). In that respect, Fanning and Little Fanning are estavelles, a type of spring whose fluctuations in discharge reflect the direct relationship between groundwater potential and stream stage (Copeland 2003).

The park has documented all significant brownouts at Fanning since 1997, and it began to monitor spring clarity in 2009. From this data, Fanning Spring has rarely reversed its direction of flow. From 1997 to 2012, however, partial flow reversals may have occurred as many as 15 times judging from tidal or flood induced brownouts (DRP, District 2 files). During the 15-year period from 1997 to 2012, complete brownouts at Fanning Spring have occurred nearly 13% (i.e. total brownout days/total days X 100) of the time (DRP, District 2 files). There seems to be a significant positive linear relationship between the average number of brownout days at Fanning and the spring flood frequency when calculations use a conservative water level measurement at the Wilcox gage (e.g., Wilcox = 9.0) as an indicator (DRP, District 2 files). During the period from 1993 to 2012 (i.e. using Wilcox gage indicator), there have been as many as 32 brownout events, with 66%

the result of flooding and the remaining 34% due to tidal influence. Additionally, from 1997 to 2012 a slightly negative relationship existed, with a decreased river stage observed at brownout during those years.

This cursory evidence suggests that brownouts at Fanning have become more frequent since the park was acquired (DRP, District 2 files, various sources). Whether the evidence indicates that the groundwater fluctuations are natural (i.e., due to Atlantic multi-decadal oscillation) or anthropogenic (i.e., due to water supply withdrawals) is still unclear (Kelly 2004; Williams et al. 2011). Nonetheless, many water managers worry about the unsustainable depletion of groundwater resources in the Floridan aquifer (Bush and Johnston 1988; Grubbs and Crandall 2007; Copeland et al. 2011). Concerns over decreased water supplies heightened during the recent droughts of 1998-2002 and 2011, as water scientists documented significant declines in spring discharge at nearly all of Florida's first magnitude springs, including Fanning (Copeland et al. 2011; Pittman 2012). From 1942 to 2012, nine major droughts and fourteen significant flood periods were recorded for north peninsular Florida (Verdi et al. 2006; Verdi and Tomlinson 2009). Three of the worst droughts in history in the Suwannee River Basin occurred in 1954-56, 1998-2002, and 2010-2012 (SRWMD 2012; Verdi et al. 2006).

When rainfall levels in the Fanning Springshed are high, the age of the groundwater discharging from the spring is relatively young because of rapid infiltration of the aquifer by surface water and its speedy transport through the extensive conduit system in the basin. The thin freshwater lens that constitutes the Floridan aquifer sits atop a larger mass of much denser saline water (Copeland et al. 2011). During periods of abundant rainfall when aquifer recharge exceeds spring discharge, this freshwater lens increases in size. On the other hand, during times of drought when there is less young surface water available to recharge the Floridan, groundwater levels decline and the lens decreases in size. With less recharge, groundwater head pressure decreases and spring discharge also declines. Consequently, older and deeper Floridan water eventually replaces the younger, fresher groundwater near the surface (Upchurch 1992; Katz 2004).

The discharge of Fanning Spring at base flow consists primarily of older groundwater ranging from 15 to 30 years in age (Katz et al. 1999). This older, deeper groundwater contains higher levels of limestone-based analytes (e.g., calcium, bicarbonate, etc.) than the younger, shallower upper Floridan or surficial aquifer because it has been in the aquifer longer. Water experts use these limestone-based analytes, as well as saline indictors such as chloride, strontium, and conductivity, as diagnostic tools to ascertain the presence of saltwater encroachment (Neuendorf et al. 2005). The significance of saltwater encroachment at Fanning Spring will be addressed in the section below.

Many water management experts acknowledge that the two most recent long-term droughts and increased consumptive use of groundwater have combined to cause a significant lowering of water tables and decreased spring flows across the entire state (Mirti 2001; Swihart 2011; Still 2010; Copeland et al. 2011). As many as seven springs within the Southwest Florida Water Management District no longer

flow (Champion and Starks 2001). Additionally, water managers can now correlate specific regional draw-downs of the aquifer with shrinking springsheds and declining spring flows (Mirti 2001; Grubbs and Crandall 2007; Grubbs 2011). Given the projected water supply needs for the area, the USGS predicts that groundwater levels throughout Florida, including those in the Fanning Springshed, will continue to decline (Sepulveda 2002).

One additional concern of water management experts is the cumulative effect of lowered aquifer levels and sea level rise to changes in natural communities such as floodplain swamps (Williams et al. 1999; Light et al. 2002). The rate of forest retreat in floodplain swamps (e.g. bald cypress: Taxodium disticum) along the Suwannee River has been documented, but it is not known how rapid these affects will proceed under cumulative stressors (Geselbracht et al. 2015).

The SRWMD is the state agency responsible for issuing water use permits in the Fanning-Manatee Springshed, and in so doing, it must ensure that proposed uses are in the public interest, which includes the conservation of fish and wildlife habitat and the protection of recreational values. Currently, Florida's water management districts are only required to derive an approximation of groundwater extraction yields (Fernald and Purdum 1998). Groundwater models are then used to determine sustainable yields for water supply (for a summary of all Florida models, see Schneider et al. 2008). Numerous water scientists now suggest that Florida can no longer rely on estimation techniques to monitor groundwater extraction, especially for agricultural purposes, and they recommend that all freshwater consumptive use of the Floridan aquifer be accurately tracked (Kincaid 2011; Gao et al. 2007). An accurate understanding of Florida's freshwater budget, especially within the Fanning/Manatee Springshed, is integral to restoring historic groundwater flow to Fanning Springs.

Water quality

The three main water quality issues affecting Fanning Springs State Park are 1) erosion/sedimentation on slopes above the Suwannee River and the headspring, 2) localized and regional groundwater contamination, and 3) the significant decline in ecological health of the springs and spring-run streams. There is a vast amount of water quality data available for Fanning Spring (SRWMD 2012; Hornsby and Ceryak 1998; Scott et al. 2004; USGS 2012). Many water management agencies collect, store, and manage hydrological information that is accessible by all through a variety of web-based databases (USGS 2012; SRWMD 2012; FDEP 2012b; FDEP 2012e).

As described above in the Soils section, most of the erosion that once contributed excessive sediment loads to surface waters in the park has been mitigated successfully. However, there are still some areas on the steep banks of Fanning and Little Fanning springs and along the Suwannee River where additional erosion control measures may be needed. Because the Floridan aquifer in the area is unconfined, surface waters have the potential to funnel contaminants through karst

features directly into high quality groundwater resources below (Cichon et al. 2004). That is one reason why district and park staffs are ever-watchful for signs of increased erosion, storm water runoff, and sedimentation inside the park.

Deterioration of groundwater quality in the Fanning 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. Rural agriculture, primarily consisting of row crops and dairies, is the predominant land use in the Fanning Springshed (SRWMD 2005). 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 (Obreza and Means 2006). Eight dairies are located within the Fanning Springshed, six of which are large enough to require industrial wastewater permits.

Scientists conducting nitrogen-15 isotope research at Fanning Spring have confirmed that heavy fertilizer use and the numerous large dairy operations in the region are the primary sources of the inorganic/organic nitrogen contamination of groundwater in the Fanning Springshed (Katz et al. 1999; Albertin et al. 2007). 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. Even though certain agricultural activities pose the most significant threat to groundwater and surface water resources at Fanning, two small cities in the Fanning Springshed, Trenton and Chiefland, have an equally crucial influence on water quality in the park.

For the past 25 years, water managers have monitored groundwater quality and levels in numerous types of wells in the state. Over 250 different wells that are scattered throughout the Fanning-Manatee Springshed are used to track changes in groundwater quality within the basin (FDEP 2012e). Some of these wells have the specific purpose of documenting changes associated with known contamination sites including two near the park (Maddox et al. 1998; Environmental Consulting and Technology Incorporated 2002; FDEP 2012e). Past sampling at these wells has shown that some parameters, particularly nitrate concentrations, have significantly exceeded the state's primary drinking water standards for maximum contaminant levels (FDEP 2012b). Of 188 wells in the Fanning Springshed that had nitrate data available, over 57 percent had nitrate concentrations higher than 1 milligram per liter (mg/L), and over 5 percent had nitrate concentrations higher than the 10 mg/L groundwater standard (Harrington and Wang 2011). The highest nitrate concentration measured in a well within the springshed was 62 mg/L. Naturally occurring background levels for nitrates in groundwater should be less than 0.01 mg/L (Cohen et al. 2007).

There are eight facilities in the region that discharge treated wastewater into the groundwater. The two largest facilities are in Chiefland, which produces 0.475 million gallons per day (mgd), and in Trenton, which produces 0.20 mgd. In Fanning Springs, Trenton, and Chiefland, there are at least 13 waste cleanup sites equipped with monitoring wells and 100 other wells used to monitor aquifer

contamination (FDEP 2012e). An additional 50 monitoring wells in the region provide background data about the Upper Floridan aquifer. The FDEP, in cooperation with the SRWMD, conducts long-term trend analyses on some of these groundwater wells. There is also a permanent surface water site, Station # SUW 160, located just upstream of Fanning Spring on the Suwannee River. This station is part of the Temporal Variability Network program (FDEP 2012f**,** Jenkins et al. 2010).

From 2000 to 2006, quarterly monitoring of surface water quality took place in 18 important springs in Florida, including Fanning Spring (FDEP 2008). Reports from this work, published by FDEP as Ecosummaries, contain quarterly ecosystem health assessments. During the six-year Ecosummary monitoring period, nitrate-nitrite levels were consistently high at Fanning Springs, ranging from 3.7 to 6.3 mg/L (Harrington and Wang 2011). Of the 18 springs monitored, Fanning had by far the poorest water quality based on the nitrate-nitrite parameter. The occurrence of elevated nitrogen levels at Fanning during this brief period is not particularly surprising given the record for the 1946-2012 period during which nitrate-nitrite levels averaged just over 4.5 mg/L (DRP, District 2 files, various sources).

Unfortunately, elevated groundwater nutrients have contributed to significant declines in the ecological health of spring systems all across Florida, including Fanning (Jones et al. 1996; Munch et al. 2006; Cohen et al. 2007; Albertin 2007; Wetland Solutions Inc. 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 (i.e., 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. 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).

Historical narratives and photographic records of Fanning Spring illustrate that a high diversity (at least 10 species) of submerged aquatic vegetation (SAV) once covered significant areas of the spring bottom (DRP, District 2 files, various sources). At one time, the tape grasses *Vallisneria* and *Sagittaria* dominated the entire Fanning system. Ecologist Howard Odum recorded a high diversity of SAV at Fanning Spring in 1953 (Odum et al. 1953). Shortly after, Fanning Springs was characterized as a healthy, hard-mineral freshwater system containing both algal and SAV components (Whitford 1956). It is noteworthy that in the mid-1900s a diverse assemblage of "attached" and "unattached" algae comprised over 50% of the aquatic plant growth at Fanning Spring (Whitford 1956). In other words, a healthy Fanning Spring ecosystem should include a biologically diverse assemblage of algae and microscopic diatoms, as well as a rich diversity of SAV.

Subsequent documentation of the SAV community at Fanning indicates that the spring ecosystem remained intact and healthy through the 1980s (Rosenau 1977; DRP, District 2 photographic records). The first observed decline in SAV diversity at Fanning Spring occurred from 1995-2001, during which period the park documented a decline of SAV cover in the spring and spring run from about 50% in 1995 to less than 1% in 2001. Although the specific causes of the SAV decline are still unclear, the park staff suspects that increased recreational pressures from swimmers and boaters, especially during low water levels, were at least partially responsible. After the completion of facility improvements at the spring in 1999, the park initiated a small-scale SAV restoration effort there by planting SAV along the eastern slope of the spring boil with only limited success. As of 2012, only a few small patches of SAV persisted in isolated areas around the perimeter of the spring, covering less than 1% of the entire spring bottom. Species diversity was poor, with only three native and one non-native species present. Both *Vallisneria* and *Sagittaria* were nearly absent from the entire system with the exception of a 3-square foot section in the flow way of the small seepage spring that originates in the floodplain swamp north of the headspring. In addition, 99% of the spring bottom was either bare sand or covered by nuisance filamentous algae. Water managers continue to debate the causes of the dramatic ecological shift at Fanning from the highly diverse SAV/algae-dominated system of the 1980s to the low diversity monoculture of benthic algae prevalent today, but it should be apparent that the ecological health of the ecosystem is in marked decline (Harrington and Wang 2011; Copeland et al. 2011).

Scientists say that water quantity variables such as spring discharge velocity and water quality variables such as nitrate concentration are necessary parameters for understanding trends in the health of groundwater resources (Brown et al. 2006). Springs are considered excellent indicators of changes in groundwater quantity and quality over time. Indeed, Florida's springs act as the proverbial "canary in the coal mine," giving us early warning about declines in health of the Floridan aquifer. The quality of spring water is extremely dependent on spring flow rates and groundwater levels, and it is very sensitive to changes in those parameters (Copeland et al. 2011; Wetland Solutions Inc. 2010). Even early researchers in the ecology of spring systems realized that the velocity of spring discharge is one of the most important factors in maintaining healthy, diverse spring ecosystems (Odum et al. 1953; Whitford 1956).

A recent statewide analysis of water quantity and quality variables compared groundwater and spring water parameters from 1991 to 2003 (Copeland et al. 2011). Specifically during that period, analysis of rock-matrix and saline analytes indicated that the Floridan's freshwater "lens" had decreased significantly in volume and that significant saltwater encroachment had occurred throughout most of the state (Copeland et al. 2011; Hydrogeologic Inc. 2011). Coastal springs such as Fanning also experienced lateral saline encroachment (Neuendorf et al. 2005; Marella and Berndt 2005; Verdi et al. 2006; Copeland et al. 2011). The major conclusion was that the drought of 1999-2001 had precipitated significant negative

health trends in all spring systems in the state, including Fanning, because of lowered groundwater levels, significant saline encroachment, and simultaneous increases in groundwater use during one of Florida's worst droughts on record (Verdi et al. 2006).

In 1996, the FDEP initiated a formal statewide program for monitoring surface waters and groundwater, including those within the Lower Suwannee River Basin (Maddox et al. 1992; FDEP 2009). This Integrated Water Resource Monitoring Program (IWRMP) took a comprehensive watershed approach based on natural hydrologic units. The 52 hydrologic basins in Florida were placed on a five-year rotating schedule, which allows water resource issues to be addressed at different geographic scales (Livingston 2003). In addition, the IWRMP assigned a water body identification number (WBID) to each water body; the WBID for Fanning Spring is 3422S. This watershed approach provides a framework for implementing Total Maximum Daily Load (TMDL) requirements that will attempt to restore and protect water bodies that have been declared impaired (Clark and DeBusk 2008). According to FDEP basin status and water quality reports for north Florida, several springs, including Fanning, as well as sections of the Lower Suwannee River Basin all became potentially impaired water bodies in 2003 because of excessive nutrients, total coliform bacteria, high mercury levels, or low dissolved oxygen (Copeland et al. 1999; Silvanima et al. 2008; FDEP 2001; FDEP 2003). Based on the Impaired Waters Rule (IWR), the EPA in 2003 verified that those water bodies were impaired, which meant that their surface water quality did not meet applicable state water quality standards (IWR, Chapter 62-303 F.A.C). This designation triggered a long chain of mandatory requirements that Florida would have to accomplish to achieve compliance with EPA regulations concerning polluted water bodies. For Fanning Springs, the compliance process started in 2008 with the assignment of a TMDL (Hallas and Magley 2008) and the initiation of a Basin Management Action Planning (BMAP). As of 2014, the BMAP for the Lower and Middle Suwannee River basins was in draft format.

Natural Communities

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

The system of classifying natural communities employed in this plan was developed by the Florida Natural Areas Inventory (FNAI). The premise of this system is that physical factors such as climate, geology, soil, hydrology and fire frequency generally determine the species composition of an area, and that areas that are similar with respect to those factors will tend to have natural communities with similar species compositions. Obvious differences in species composition can occur, however, despite similar physical conditions. In other instances, physical factors are

substantially different, yet the species compositions are quite similar. For example, coastal strand and scrub--two communities with similar species compositions--generally have quite different climatic environments, and these necessitate different management programs. Some physical influences, such as fire frequency, may vary from FNAI's descriptions for certain natural communities in this plan.

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

The park contains 8 distinct natural communities as well as altered landcover types and developed areas (see Natural Communities Map). A list of plants and animals known to occur in the park is contained in Addendum 5.

Upland Hardwood Forest

Desired future condition: Upland hardwood forest is a mature, closed canopy hardwood forest typically occurring on slopes and rolling hills with generally mesic conditions. Overstory tree species may consist of southern magnolia (*Magnolia grandiflora*), pignut hickory (*Carya glabra*), sweetgum (*Liquidambar styraciflua*), live oak (*Quercus virginiana*), laurel oak (*Quercus laurifolia*), Florida maple (*Acer saccharinuum* subsp. *floridanum*), spruce pine (*Pinus glabra*) and swamp chestnut oak (*Quercus michauxii*). Understory species may include trees and shrubs such as American holly (*Ilex opaca*), flowering dogwood (*Cornus florida*), eastern hophornbeam (*Ostrya virginiana*), American hornbeam (*Carpinus caroliniana*), eastern redbud (*Cercis canadensis*), red bay (*Persea borbonia*), horse sugar (*Symplocos tinctoria*), and beautyberry (*Callicarpa americana*). Groundcover will consist of shade-tolerant herbaceous species, sedges and vines.

Description and assessment: Upland hardwood forest at Fanning Springs occupies a large portion of the natural area of the park, extending south and east of the spring-run streams. The upland hardwood forest is found at slightly lower elevations than the surrounding upland mixed woodland and successional hardwood forest. The upland hardwood forest likely developed in the fire shadow created by the Suwannee River and the spring-run streams. The boundary between upland hardwood forest and adjacent uplands is blurred due to long-term fire exclusion in the upland mixed woodland.

The upland hardwood forest is dominated by mature southern magnolia and pignut hickory. The canopy is estimated to be at least 70-80 ft tall. The core of this area,

east of Little Fanning Spring, is in excellent condition and should be afforded a high level of protection. Areas that were selectively logged in the past or were otherwise disturbed are in fair to good condition.

General management measures: In general, upland hardwood forest requires little active management. Monitoring for impacts from feral hogs and the removal of exotic plant species will be the primary management efforts.

Mesic Hammock

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

Description and assessment: Mesic hammock in the park is associated with slopes and levees above the alluvial forest in the southwest corner of the park. The dominant species in the canopy are live oak and laurel oak. Slender woodoats (*Chasmanthium laxum*) is a common species in the groundcover. Infrequent inundation by floodwaters of the Suwannee River undoubtedly affects the species composition of the mesic hammock in this area.

Mesic hammocks may also contain scattered loblolly pines, particularly where there have been past disturbances. Mesic hammocks typically lack the high diversity of canopy tree species seen in the upland hardwood forest. Most of the mesic hammock in the park is in good condition with the exception of limited spoil areas.

General management measures: Little active management of mesic hammocks is required beyond control of feral hog populations and removal of exotic plant species. It is likely that the intermittent flood events along the Suwannee contribute to the differentiation of mesic hammock from adjacent upland hardwood forests.

Upland Mixed Woodland

Desired future condition: Dominant tree species in upland mixed woodland include longleaf pine (*Pinus palustris*), southern red oak (*Quercus falcata*), sand post oak

Legend

- MEH - Mesic Hammock 3.48 ac.
- UHF - Upland Hardwood Forest 68.9 ac.
- UMW - Upland Mixed Woodland 8.7 ac.
- AF - Alluvial Forest 6.61 ac.
- FS - Floodplain Swamp 5.41 ac.
- BST - Blackwater Stream 0.52 ac.
- SRST - Spring-Run Stream 3.2 ac.
- ACV - Aquatic Cave 0.017 ac.
- DV - Developed 27.46 ac.
- SA - Spoil Area 0.19 ac.
- SHF - Successional Hardwood Forest 72.17 ac.

19

DV
SHF
UHF
BST
FS
SRST
UMW
ACV
FS
UHF
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SA
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DV
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UHF
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bing™

FANNING SPRINGS STATE PARK

N

0 200 400 800 Feet

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

NATURAL COMMUNITIES
EXISTING CONDITIONS MAP

(*Quercus margaretta*), and mockernut hickory (*Carya alba*). Hardwood tree species are frequently dominant or co-dominant with pines. Flowering dogwood (*Cornus florida*) and pignut hickory (*Carya glabra*) may be present. Subcanopy species typically include sparkleberry (*Vaccinium arboretum*) and rusty blackhaw (*Viburnum rufidulum*). Percent herbaceous cover will be comparable to that of sandhill and herbaceous plants will be 3-4 feet in height during spring and summer. In some areas, grasses and forbs may reach heights of 6-8 feet or more during the fall due to blooming of taller grass species such as yellow indiangrass (*Sorghastrum nutans*), silver plumegrass (*Saccharum alopecuroides*), and big bluestem (*Andropogon gerardii*)). In old growth conditions, oaks and hickories are commonly 150-200 years old. The optimal fire return interval for this community is 2-5 years, depending on adjacent natural communities.

Description and assessment: Upland mixed woodland often serves as a transition zone between upland pine and adjacent upland hardwood forests or mesic hammocks. As with upland pine, upland mixed woodland is a fire-adapted community with longleaf pine dominant and with scattered southern red oaks and mockernut hickories. However, upland mixed woodland typically lacks wiregrass as a dominant groundcover, and the oaks and hickories may be co-dominant with longleaf pines. Being a transitional community, upland mixed woodland is very susceptible to succession towards upland hardwood forest when there is a lack of fire. As a result, very few intact examples of upland mixed woodland exist in north central Florida.

Field notes from the 1847 survey describe the uplands just east of Fanning Springs as a “mixed growth of pine, oak, hickory” (Volume 158, page 403 of 1847 survey of the west boundary of Sec. 28 T10S, R14E). This is in contrast to areas further east that are described as pinelands. Based on this information, it is likely that the pine, oak and hickory areas described in the survey notes were upland mixed woodland, and the lands further to the east, well outside the park boundary, were sandhills. Some of the uplands to the south in the Andrews Wildlife Management Area and in Manatee Springs State Park are similar, but in better condition, and they also appear to lack wiregrass, which is a characteristic of upland mixed woodland.

It is likely that all of the longleaf pines were cut from the park prior to 1900 due to the close proximity to the Suwannee River and sawmills. Some areas were converted to agriculture (1848 plat map for T10S, R14E) and are now either within the developed area of the park or are successional hardwood forest. In those areas not completely cleared, fire suppression has caused the majority of the herbaceous species to be shaded out by offsite hardwoods such as laurel oak and sweetgum. The dense hardwood growth and a lack of fire make it difficult to distinguish many of these areas from upland hardwood forest. The areas mapped as existing upland mixed woodland are those areas where restoration efforts have been initiated, and where current fuel conditions are more amenable to supporting prescribed fires. These areas are considered to be in poor condition and retain only scattered southern red oaks, mockernut hickories, and longleaf pines. The majority of what was once upland mixed woodland is currently classified as successional hardwood forest.

General management measures: Restoration of the upland mixed woodland will require an expansion of prescribed fire efforts and removal of offsite hardwood species. Planting of longleaf pines will be postponed until the canopy is sufficiently open to allow longleaf seedlings to survive. Staff will need to conduct additional field surveys to verify the extent of the upland mixed woodland and to determine priorities for restoration efforts.

Alluvial Forest

Desired future condition: Alluvial forests are hardwood forests found in river floodplains on ridges or slight elevations above floodplain swamp. Alluvial forests usually flood for one to four months of the year during the growing season. Typical overstory trees may include overcup oak (*Quercus lyrata*), laurel oak (*Quercus laurifolia*), water hickory (*Carya aquatica*), American elm (*Ulmus americana*), and red maple (*Acer rubrum*). Understory species may include swamp dogwood (*Cornus foemina*), willow species (*Salix* spp.), and American hornbeam (*Carpinus caroliniana*). Presence of groundcover will be variable. Species such as netted chain fern (*Woodwardia areolata*) and other shade-tolerant herbaceous species may be present.

Description and assessment: Alluvial forest occurs within the park in association with the Suwannee River floodplain. Located upslope from adjacent floodplain swamps, the alluvial forests typically are relatively narrow, linear areas that parallel the Suwannee River and the spring-run streams within the park.

In most cases, the alluvial forest in the park is in relatively good condition; however, the alluvial forest in the southwest portion of the park has been impacted by a housing development project (Fort Fanning subdivision). In this area, causeways were built across the alluvial forest and floodplain swamp to access lots along the river levee. At least one of these causeways is located within the park. Although culverts allow drainage under most of the causeways, these culverts are not sufficient to prevent impoundment of water in the floodplain. Other impacts resulted from the installation of several raised drain fields and septic systems, along with underground electrical service in the floodplain. Although these utilities were never actually used, they remain as disturbances within the floodplain and mesic hammock.

Additional historical disturbances include an archaeological site where limestone was extracted to obtain a low grade of iron ore during the Civil War period. This “bog iron” was refined at an offsite location to produce iron. The disturbed area, which contains exposed limestone bedrock, numerous holes, rubble piles, and berms, is located near the ecotone between the alluvial forest and adjacent upland hardwood forest.

General management measures: Alluvial forest requires little active management other than protection from erosion impacts, control of feral hogs, and control of invasive exotic plant species. Restoration of the spoil areas and causeway in the southern end of the park will be initiated with development of a restoration plan.

Floodplain Swamp

Desired future condition: The floodplain swamp is a frequently or permanently flooded community in low-lying areas along streams and rivers. Soils consist of a mixture of sand, organics, and alluvial materials. The closed canopy will typically be dominated by bald cypress (*Taxodium distichum*), but it commonly includes tupelo species (*Nyssa* spp.) and water hickory (*Carya aquatica*), red maple (*Acer rubrum*) and overcup oak (*Quercus lyrata*) as well. Trees bases are typically buttressed. The understory and groundcover are sparse.

Description and assessment: Floodplain swamp occurs adjacent to both spring-run streams in the park and within the floodplain of the Suwannee River in the southwest portion of the park. It is located down-slope of the alluvial forest, predominately in backwaters and low areas behind the primary river levee. These areas are frequently flooded by the river and may actually funnel river flow during high water events if connections to the river exist at more than one location.

As with the alluvial forest, causeways and other intrusive elements of the failed Fort Fanning subdivision have impacted the floodplain swamp in the southwest corner of the park. The floodplain swamps adjacent to the spring-run streams have undoubtedly experienced some side effects from the intensive recreational use that is occurring along the streams. Floodplain swamp is relatively resilient, however, and other than removing the causeway and preventing/mitigating erosion around the springs, little additional management will be necessary for it to recover from these impacts. The floodplain swamps in the park are generally in good condition.

General management measures: Floodplain swamps require little active management other than protection from erosion impacts, control of feral hogs, and control of invasive exotic plant species. Staff will monitor river access points and visitor use areas within the floodplain swamp for erosion issues and will mitigate impacts as needed. Staff should also monitor bald cypress stands in the park for any significant changes or die-offs.

Blackwater Stream

Desired future condition: Blackwater streams are perennial or intermittent watercourses originating in lowlands where extensive wetlands with organic soils collect rainfall and runoff, discharging it slowly to the stream. The stained waters are laden with tannins, particulates, and dissolved organic matter derived from drainage through adjacent swamps, resulting in sandy bottoms overlain by organic matter. Emergent and floating vegetation, including golden club (*Orontium aquaticum*), smartweeds (*Polygonum* spp.), grasses and sedges may occur, but steep banks and dramatic seasonal fluctuations in water levels often limit their presence. To achieve desired conditions, it will be necessary to minimize disturbance and alterations and to preserve adjacent natural communities.

Description and assessment: The Suwannee River is a typical blackwater stream and is renowned worldwide, having both scenic and historic significance. There is about two-thirds of a mile of river frontage along the western boundary of the park. Nitrates are of particular concern in the river since a significant increase in nitrate levels has been detected throughout the Suwannee River Basin. Maintenance of historic flows and levels in the river is another top concern.

Hydrilla (*Hydrilla verticillata*), a noxious exotic plant, is established in the Suwannee River. Fortunately, it does not flourish in the dark, tannin-stained waters as well as it does in clearer waters. The hydrilla in the Suwannee, however, is almost impossible to eradicate completely, and the possibility of it spreading into the clear spring runs is a constant threat. The blackwater stream within the park is considered to be in fair to good condition.
General management measures: Regular monitoring of water quality and quantity in the Suwannee River is an important management measure. This will be accomplished in cooperation with the FDEP and SRWMD. Monitoring and mitigation of riverbank erosion will also be a priority.

Spring-Run Stream

Desired future condition: A spring-run stream is a perennial watercourse which derives most, if not all, of its water from the underground aquifer through artesian openings in the limestone. The waters of spring-run streams are 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, 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 within slow moving pools. Typical vegetation includes tapegrass (*Valisneria americana*), arrowheads (*Sagittaria* spp.), southern naiad (*Najas guadalupensis*), and pondweeds (*Potamogeton* spp.).

Description and assessment: Two spring-run streams are located in the park, Fanning Spring and Little Fanning Spring. These are fed by several large spring vents as well as by numerous smaller springs emerging from the sides and bottom of the spring-run streams. The Hydrology section above describes the relatively denuded condition of the spring-run streams in the park and the various factors that may negatively influence them. Based on these factors, plus the recently declining flows, the spring-run stream is considered to be in poor condition. Recent restoration efforts, described in the Soils section above, include the suction dredging of sediments in Fanning Spring to restore the natural contours and improve access for manatees.

General management measures: The DRP will continue to work with appropriate state and federal agencies such as the SRWMD in seeking ways to restore the ecological health of the spring systems in the park. Park staff will monitor and mitigate any erosion occurring on slopes above the springs and in communities adjacent to the springs.

Aquatic Cave

Desired future condition: Characterized as cavities below the ground surface in karst areas, a cave system may contain portions classified as terrestrial caves and portions classified as aquatic caves. The latter vary from shallow pools highly susceptible to disturbance, to more stable, totally submerged systems. To achieve desired future conditions, it will be necessary to minimize disturbance and alterations that may increase pollution in aquatic systems.

Description and assessment: Aquatic caves of undetermined size and extent occur in the park. These aquatic caves exist in association with the Floridan aquifer, the supplier of groundwater to Fanning Spring and Little Fanning Spring. Although the caves are not accessible to humans, they may provide habitat for troglobitic species of crustaceans such as those found within the Manatee Springs cave system to the south. At this time, no detailed information is available about the condition or extent of the cave system.

General management measures: Management of the aquatic caves will mainly entail protecting cave entrances from excessive erosion and continuing to monitor water quality and quantity within the Fanning Springshed.

Altered Landcover Types

Developed

Developed areas within the park include the swimming facilities and boardwalks at Fanning Spring, along with a parking area and associated recreation areas in the uplands north of Fanning Spring. The park contains several buildings, including an entrance station, a park office south of Fanning Spring and two staff residences in the northeast portion of the park. Another former residence, the historic log cabin, is located in the southwest portion of the park on a large cleared lot adjacent to the Suwannee River. There are also five rental cabins in the park south of the residences. A former Florida Department of Transportation (FDOT) wayside park located at the northwest corner of the park is also managed by the DRP. A complete list of all the developed areas is contained in the Land Use Component.

At this time, there are no plans to restore any of the developed altered landcover areas to the original natural community. Priority invasive plant species classified by the Florida Exotic Plant Pest Council (FLEPPC) as Category I and II species will be removed from all developed areas. Other management measures will include the use of proper stormwater management techniques for developed areas and the designing of future development so that it is compatible with prescribed fire management in adjacent natural areas.

Spoil Area

Limited areas of spoil are found in the mesic hammock, alluvial forest, and floodplain swamp communities in the southwestern end of the park in association

with a former housing development site. The spoil piles and a causeway within the floodplain will either be removed or breached as needed to restore natural hydrological patterns. The long-term goal for the spoil areas should be to restore them to whatever natural community existed there before alterations took place, whether mesic hammock, alluvial forest, or floodplain swamp. Please see the desired future condition statements for these natural communities described above.

Successional Hardwood Forest

The successional hardwood forests within the park are probably derived from former upland mixed woodlands that were subjected to the harvesting of longleaf pines and selected hardwoods in the distant past. Laurel oaks and other invasive offsite species that typically colonize disturbed, fire-excluded areas, now dominate much of this area. The long-term goal for the successional hardwood forest is to restore it to upland mixed woodland with a species mix as representative of the original natural community as possible. Please see the desired future condition statement for that natural community described above.

Although remnant longleaf pines and southern red oaks are scattered through the successional hardwood forest, they occur at far below natural density. Decades of fire exclusion and shading by hardwoods have caused the loss of herbaceous groundcover, so restoration to the original natural community would be very difficult. Initial restoration efforts will focus on areas adjacent to current restoration sites in upland mixed woodland near the east boundary of the park. Additional surveys may be able to locate other groups of longleaf pines in the successional hardwood forest that would benefit from prescribed fires. These areas will be included in the prescribed fire program if appropriate, but the majority of the successional hardwood forest would require large-scale restoration efforts before prescribed fire could be used effectively. The optimal fire return interval for any areas of successional hardwood forest that are included in the prescribed fire program should be 2-5 years.

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 USFWS, FWC or FDACS as endangered, threatened or of special concern.

Table 2 contains a list of all known imperiled species within the park and identifies their status as defined by various entities. It also identifies the types of management actions 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 following the table. Explanations for federal and state status as well as FNAI global and state rank are provided in Addendum 6.

Perhaps the most significant imperiled species that occurs at Fanning Springs is the West Indian manatee. Manatees are regularly sighted in the Suwannee River and in the spring and spring run, especially during cold weather. Manatees avoid becoming

hypothermic in the cold river waters by seeking refuge in the springs, which are often warmer and more constant in temperature. The West Indian manatee must be protected from impacts due to park development and recreational use. Harassment of manatees will not be tolerated and park staff will continue to provide visitors with interpretive information to inform them about manatees and their protection. Staff will also keep records of manatee use of the spring runs and document interactions with park visitors. All incidents of manatee harassment by park visitors are recorded on a standard Incident Report as required for all incidents involving negative impacts on imperiled species. Use of the spring run by motorized vessels has the potential to discourage manatee use of the spring run, or possibly injure manatees. Conflicts between manatees and motorized vessels are of greatest concern during the winter months when manatees need access to warm water refugia.

The dredging of Fanning Spring and spring-run in 2002 and 2011 has restored a more natural bottom contour by removing unnatural accumulated sediments. One goal of this project was to improve access for manatees, particularly during low water periods. The second phase of the Fanning Springs Sediment Removal & Dock Modification project was completed in 2014 with the removal of one section of floating dock to further improve access for manatees. The gap in the floating dock will also create an opening for surface flow and movement of floating plant materials.

Another imperiled species that occurs within the Suwannee River adjacent to Fanning Springs is the gulf sturgeon *(Acipenser oxyrinchus desotoi*), a federally threatened subspecies of the Atlantic sturgeon. At certain times of the year, sturgeons are readily apparent at the park, leaping into the air as they navigate the river.

Gopher tortoises (*Gopherus polyphemus*) also occur within the park. The tortoise and other species common to upland mixed woodland have suffered from long-term fire suppression and community alterations within the park. Because of the loss of the open upland mixed woodland and its replacement by a closed-canopy successional hardwood forest, the remaining gopher tortoises at Fanning Springs have relocated to the developed area of the park south of U.S. Highway 19/98. Several large and active gopher burrows occur in this open field; these represent the only known significant population of gopher tortoises within the park. A gopher tortoise population also occurs along the Nature Coast State Trail that runs east of the park boundary, but unsuitable habitat separates the two populations. Gopher tortoises should be protected from future development impacts. A long-term and intensive prescribed burning and planting program will be necessary to restore sufficient upland mixed woodland on site to support the current gopher tortoise population. As more experience is gained in restoring remnants of upland mixed woodland in the park, consideration will be given to restoring larger areas that could better support the gopher tortoise population.

As is the case with other large aquatic turtles and the gopher tortoise, the Suwannee cooter (*Pseudemys suwanniensis*) was once harvested for human

consumption. Park staff should be particularly vigilant to protect these species from poaching within the park. The Suwannee cooter and other aquatic turtles require relatively open and sunny upland areas in which to lay their eggs to ensure proper incubation temperatures. Maintenance of open spots within the developed areas will benefit these species.

The spiked crested coralroot (*Hexalectris spicata*) is the only naturally occurring, imperiled plant species known from the park at this time. The star anise (*Illicium parviflorum*) was introduced to the park during past landscaping efforts and does not naturally occur at Fanning Springs.

Table 2: Imperiled Species Inventory

Common and Scientific Name	Imperiled Species Status				Management Actions	Monitoring Level
	FWC	USFWS	FDACS	FNAI		
PLANTS						
Spiked crested coralroot *Hexalectris spicata*			LE		10	Tier 1
Star anise * *Illicium parviflorum*			LE	G2,S2	10	Tier 1
*introduced as landscape plant						
FISH						
Gulf sturgeon *Acipenser oxyrinchus desotoi*	FT	LT		G3T2, S2	4,9,13	Tier 1
REPTILES						
American alligator *Alligator mississippiensis*	FT(S/A)	T(S/A)		G5,S4	4,10, 13	Tier 1
Eastern indigo snake *Drymarchon couperi*	FT	LT		G3,S3	1,6,7	Tier 1
Gopher tortoise *Gopherus polyphemus*	ST	C		G3,S3	1,6,7, 8,10, 13	Tier 2
Alligator snapping turtle *Macrochelys temminckii*	SSC			G3G4 , S3	4,9	Tier 1
Suwannee cooter *Pseudemys suwanniensis*	SSC			G5T3, S3	4,9	Tier 1
BIRDS						
Little blue heron *Egretta caerulea*	SSC			G5,S4	4,13	Tier 1
Snowy egret *Egretta thula*	SSC			G5,S3	4,13	Tier 1

Table 2: Imperiled Species Inventory						
Common and Scientific Name	**Imperiled Species Status**				**Management Actions**	**Monitoring Level**
	FWC	**USFWS**	**FDACS**	**FNAI**		
Tricolored heron *Egretta tricolor*	SSC			G5,S4	4,13	Tier 1
Swallow-tailed kite *Elanoides forficatus*				G5,S2	13	Tier 1
White ibis *Eudocimus albus*	SSC			G5,S4	4,13	Tier 1
MAMMALS						
West Indian manatee *Trichechus manatus*	FE	E		G2,S2	4,10, 12,13	Tier 2

Management Actions:

1 Prescribed Fire
2 Exotic Plant Removal
3 Population Translocation/Augmentation/Restocking
4 Hydrological Maintenance/Restoration
5 Nest Boxes/Artificial Cavities
6 Hardwood Removal
7 Mechanical Treatment
8 Predator Control
9 Erosion Control
10 Protection from visitor impacts (establish buffers)/law enforcement
11 Decoys (shorebirds)
12 Vegetation planting
13 Outreach and Education

Monitoring Level:

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

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

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

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

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

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

Exotic and Nuisance Species

Exotic species are plants or animals not native to Florida. Invasive exotic species are able to out-compete, displace or destroy native species and their habitats, often

because they have been released from the natural controls of their native range, such as diseases, predatory insects, etc. If left unchecked, invasive exotic plants and animals alter the character, productivity and conservation values of the natural areas they invade.
Fanning Springs State Park is fortunate in that very few invasive exotic plants occur there. The staff routinely treats all known exotic infestations in the park. Staff members survey the park every two years in an effort to find new exotic plant infestations and to assess the effectiveness of previous treatments of known populations. Since approval of the previous unit management plan in 2003, the park has treated 1.048 acres of invasive exotic plants.

Small amounts of Japanese climbing fern (*Lygodium japonicum*) do occur in the park along the banks of the Suwannee River. This is currently the species of greatest concern in the park. Staff should be diligent in scouting for and eradicating new populations of this species. Water lettuce (*Pistia stratiodes*) occurs in the spring run and should be removed by hand. Heavenly bamboo (*Nandina domestica*), camphor-tree (*Cinnamomum camphora*), and lantana (*Lantana camara*) previously occurred in the park, but have been extirpated. Park staff should still be familiar with the appearance of these species in case they return.

Two other horticultural plants in the park have the capability of spreading or persisting there. While FLEPPC does not currently list these two species as Category I or II invasive plants, park staff should remove them. Border grass (*Liriope spicata*), in particular, has been observed invading natural areas in Alachua County. The other species, Purple Queen (*Tradescantia pallida*), can persist for years and slowly expand the perimeter of its population.

Table 3 contains a list of the Florida Exotic Pest Plant Council Category I and II invasive, exotic plant species found within the park (FLEPPC 2011). The table also identifies relative distribution for each species and the management zones in which they are known to occur. An explanation of the codes is provided following the table. For an inventory of all exotic species found within the park, see Addendum 5.

Table 3: Inventory of FLEPPC Category I and II Exotic Plant Species

Common and Scientific Name	FLEPPC Category	Distribution	Management Zone (s)
PLANTS			
Japanese climbing fern *Lygodium japonicum*	I	2	FN-2D, FN-1D
Water Lettuce *Pistia stratioides*	I	2	FN-1D

Distribution Categories:

0 No current infestation: All known sites have been treated and no plants are currently evident.
1 Single plant or clump: One individual plant or one small clump of a single species.
2 Scattered plants or clumps: Multiple individual plants or small clumps of a single species scattered within the gross area infested.
3 Scattered dense patches: Dense patches of a single species scattered within the gross area infested.

4 Dominant cover: Multiple plants or clumps of a single species that occupy a majority of the gross area infested.
5 Dense monoculture: Generally, a dense stand of a single dominant species that not only occupies more than a majority of the gross area infested, but also covers/excludes other plants.
6 Linearly scattered: Plants or clumps of a single species generally scattered along a linear feature, such as a road, trail, property line, ditch, ridge, slough, etc. within the gross area infested.

Exotic animal species include non-native wildlife species, free ranging domesticated pets or livestock, and feral animals. Because of the negative impacts to natural systems attributed to exotic animals, 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 raccoons, venomous snakes and alligators that are in public areas. Nuisance animals are dealt with on a case-by-case basis in accordance with DRP's Nuisance and Exotic Animal Removal Standard.

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

The exotic animals of most concern at Fanning Springs are feral hogs (*Sus scrofa)*, feral cats (*Felis catus*), and feral dogs (*Canis familiaris*). Most of the hogs observed in the park appear to be in transit along the floodplain of the Suwannee River. When signs of hog rooting become evident in the park, the staff makes a concerted effort to remove the hogs in accordance with DRP policy. Feral cats and dogs are also removed when they are discovered in the park.

In January 2013, red bay trees (*Persia borbonia*) in the park were observed to be dying from laurel wilt disease. This disease, first observed in the United States in 2002 and in Florida in 2005, is caused by the fungus *Raffaelea lauricola*, which is transmitted by the exotic red bay ambrosia beetle (*Xyleborus glabratus*). The disease had been observed previously in Manatee Springs State Park to the south. There is no known cure for the disease, although the lives of individual infected trees may be prolonged by injecting fungicide into the cambium. To slow the spread of the disease, Fanning Springs does not permit wood from dead red bay trees to be transported into or out of the park. It is estimated that the beetle has a rate of spread of about 20 miles per year on its own, without the aid of humans.

Special Natural Features

Fanning Spring is one of Florida's 33 first magnitude springs, with spring flows ranging from negative 108 cfs when groundwater levels are low to 247 cfs when groundwater levels are high. Fanning Spring is approximately 200 feet wide and 450 feet long, with the main vent located in the southeast portion. The width of the funnel-shaped vent averages 30 feet, while depths range from 10 feet to more than

20 feet, depending on river stage. The water temperature is approximately 72 degrees Fahrenheit year round.

Cultural Resources

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). State law requires that all state agencies locate, inventory and evaluate cultural resources that appear to be eligible for listing in the National Register of Historic Places. Addendum 7 contains the 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, and the Secretary of Interior's definitions for the various preservation treatments (restoration, rehabilitation, stabilization and preservation). For the purposes of this plan, significant archaeological site, significant structure and significant landscape means those cultural resources listed or eligible for listing in the National Register of Historic Places. The terms archaeological site, historic structure or historic landscape refer to all resources that are or will become 50 years old during the term of this plan.

Condition Assessment

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

Level of Significance

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

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

The following is a summary of the FMSF inventory. Evaluations of significance of the inventory are included.

Prehistoric and Historic Archaeological Sites

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

Description: Fanning Springs State Park has a rich cultural history concentrated within less than 200 acres. The park has three archaeological sites, one historic cemetery, one linear resource, and a resource group recorded with the FMSF.

Until recently, additional sites discovered in the park were recorded individually with the FMSF. In 2000, however, several sites were subsumed into one multi-component site, LV537. The subsumed sites include LV35, LV79, LV505, LV506, LV511, LV512, and LV524, which are now all part of the resource group known as Fanning Springs Recreation Area (LV00537).

LV00537 contains components dating from the early Archaic period (6,500 B.C.), the Deptford and Weeden Island periods (500 B.C. - A.D. 700), and the Alachua period (A.D. 700 - 1565). It is possible that there are also some much earlier components from the Paleoindian period (12,000 B.C. - 6,500 B.C.). Some historic artifacts recovered in the park likely date from the Seminole War Period (A.D. 1817 - 1842) (Weisman and Newman 1995; Wheeler 1997). Twentieth century components are also present (Weisman and Newman 1995). Two new FMSF additions to the park since the last plan update are lithic scatter sites associated with the Suwannee Motel (LV00828) and Ranger Residence (LV00829).

An underwater archeological site thought to be a sunken gun boat (i.e., Civil War era shipwreck, LV00113) is located in the Suwannee River near the mouth of Fanning spring-run. It has not been observed for several years (Stokes and Faught 1996).

The Shelby Mound (LV00538) is a prehistoric site that was disturbed by looters prior to state acquisition. Little is known about the site. It needs further

investigation to determine if it is eligible for the National Register of Historic Places. The DRP also should determine if actions are needed to improve its condition. The McGrew Family Cemetery (LV00539) consists of an unknown number of family graves, identified through bibliographic and interview research. The exact boundaries of the cemetery are unknown.

The 1920's Fanning Sawmill (LV00818) and the Bog Iron Mine (LV00821) are more recently recorded sites dating from the 19th and 20th centuries. They are not subsumed into LV00537. The Bog Iron Mine is a 19th-century extractive site where hydrous iron oxide that had formed in the local swamps and springs was mined during the Civil War era (Verrill 1976). The 1920's Fanning Sawmill site contains an area of debris from an early 20th century sawmill and late 19th century storehouse owned by the Barrow family. A portion of the site may have been graded in the past to create a ball field.

Twenty-one surveys have been conducted within the park over the years (Weisman and Newman 1995; Stokes and Faught 1996; Wheeler 1997; Johnson and Scafidi 1998; Newman and Memory 2000; Hendryx 2001; Hendryx and Ferrell 2001; Davenport 2001a; Davenport 2001b; Bland and Chance 2002; Ellis and Martin 2002; Dickinson and Wayne 2003; Hendryx and Nash 2003; Davenport 2005a; Davenport 2005b; Davenport 2007; Ditullio and Moody 2009; Davenport et al. 2010; Davenport 2011; Price and Smith 2012; Collins et al. 2012).

All known sites have been submitted to the FMSF. A Predictive Model has already been completed (Collins et al. 2012).

Condition Assessment: The condition of most of the sites at Fanning Springs is good. The exceptions are a portion of LV00537, formerly LV00035, and LV00538 and LV00539.

The exact location of the former site LV00035 within the current multi-component site LV00537 is unknown, but based on previous observations it is no longer classified as a mound site. LV00538 was damaged by looting prior to being acquired by the state and is in fair condition. The condition of LV00539 has not been evaluated yet because the extent and location of the cemetery is difficult to determine.

Looting is a concern at all sites. Erosion from foot traffic is a concern for sites within the more heavily used areas of the park.

Level of Significance: The Shelby Mound (LV00538) has not been determined eligible for listing in the National Register of Historic Places due to insufficient information. Fanning Springs State Recreation Area Site (LV00537) and Log Cabin Site (LV00506) are eligible for listing in the National Register of Historic Places (Bland and Chance 2000) under Criterion D of Criteria for Listing in the National Register.

General Management Measures: Sites should be checked regularly for signs of looting and erosion. If heavy foot traffic has caused significant erosion in use areas, protective measures may need to be implemented.

Historic Structures

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

Description: Fanning Springs has one historic structure, a log cabin (LV00625) built in 1947.

Condition Assessment: The log cabin is in good condition.

Level of Significance: The Cabin (LV625) has not been evaluated for its eligibility for listing in the National Register of Historic Places, mainly because there is insufficient research to determine the history and architectural significance of the structure. In addition, it is undetermined which Criteria for Listing in the National Register would apply.

General Management Measures: The Cabin (LV00625) should be inspected annually. Maintenance will be conducted on an as-needed basis to keep the structure in good condition. Staff should document information on the history of the Cabin.

Collections

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

Description: Fanning Springs has an informal collection of items that have been found within the park. The majority of these are cultural resource objects rather than natural resource objects.

The collection items represent the span of human occupation of the area. Items include Native American stone tools and pottery, Fort Fanning and Second Seminole War material, and farming and logging artifacts from the settlement period in the late 19th and early 20th centuries. There are also items from the early period of recreational development around the spring, and even a partial segment of an important Pratt-truss highway bridge, the Fanning Springs Bridge, that formerly crossed the Suwannee River and had once been part of DI00077. The bridge span is on display in the former FDOT wayside park that is now part of Fanning Springs State Park.

The natural resources portion of the collection consists of field records, data and reports.

Condition Assessment: The condition of the collection is generally good; however, a maintenance plan is needed to keep the bridge span in good condition. Lichens are beginning to grow on the structure.

Most of the collection is not on display, but is stored in a locked cabinet in climate-controlled conditions. A few items are displayed in a glass cabinet in the ranger station. Collection items are used for interpretive programs as needed.

Level of Significance: All items with the exception of the bridge span were found in the park. They represent a broad spectrum of human history, as well as the local history of Fanning Springs, the surrounding community, and the Suwannee River. They are significant because they are the material expression of the local history.

General Management Measures: The Park has a Scope of Collections Statement. It needs to develop a plan for management of the bridge segment. No collection management assessments have been made.

Detailed management goals, objectives and actions for the management of cultural resources in this park are discussed in the Cultural Resource Management Program section of this component. Table 4 contains the name, reference number, culture or period, and brief description of all the cultural sites within the park that are listed in the Florida Master Site File. The table also summarizes each site's level of significance, existing condition and recommended management treatment. An explanation of the codes is provided following the table.

Table 4: Cultural Sites Listed in the Florida Master Site File

Site Name and FMSF #	Culture / Period	Description	Significance	Condition	Treatment
Fanning Springs Recreation Area LV00537	Archaic – 20th Century	Resource Group	N R	G	P
Shelby Mound LV00538	Pre-historic	Archaeological Site	NE	F	P
McGrew Family Cemetery LV00539	Late 19th Century	Historic Cemetery	NE	NE	P
Fort Fanning -Cedar Key Road LV00618	Second Seminole War	Linear Resource	NE	G	P

Table 4: Cultural Sites Listed in the Florida Master Site File					
Site Name and FMSF #	**Culture/Period**	**Description**	**Significance**	**Condition**	**Treatment**
Cabin LV00625	Mid-20th Century	Historic Structure	NE	G	RH
1920's Fanning Sawmill LV00818	Early 20th Century	Archaeological Site	NE	G	P
Bog Iron Mine LV00821	19th Century	Archaeological Site	NE	G	P
Suwannee Motel LV00828	?	Archaeological Site	NE	NE	P
Ranger Residence LV00829	?	Archaeological Site	NE	NE	P
Civil War Era Shipwreck LV00113	19th Century	Archaeological Site	NE	NA	P

Significance:
NRL National Register listed
NR National Register eligible
NE not evaluated
NS not significant

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

Recommended Treatment:
RS Restoration
RH Rehabilitation
ST Stabilization
P Preservation
R Removal
N/A Not applicable

Resource Management Program

Management Goals, Objectives and Actions

Measurable objectives and actions have been identified for each of DRP's management goals for Fanning 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, 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 longer- term work plans are developed for natural community restoration and hydrological restoration. The work plans provide 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, DRP's resource management strategies are systematically evaluated to determine their effectiveness. The process and the information collected is used to refine techniques, methodologies and strategies, and ensures that each park's prescribed management actions are monitored and reported as required by 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, and the annual work provide the flexibility needed to adapt to future conditions as they change during the ten-year management planning cycle. As the park's annual work plans are implemented through the ten-year cycle, it may become necessary to adjust the management plan's priority schedules and cost estimates to reflect these changing conditions.

Natural Resource Management

Hydrological Management

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

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

Objective: 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 Fanning Springs and the tracking of water quality changes within this natural spring system
Action 3	Continue to seek expertise and funding opportunities within the Fanning Springshed for dye trace studies to determine the groundwater sources for the spring and karst systems in the park
Action 4	Perform dye trace studies to determine the groundwater sources for the spring and karst systems in the park as funding becomes available
Action 5	Continue to monitor land use or zoning changes around the park's resources
Action 6	Continue to cooperate with the SRWMD to ensure MFLs for Fanning Spring are monitored for compliance in order to maintain historic river flows

The most significant hydrological features in the park include a first magnitude spring (Fanning), a second magnitude spring (Little Fanning), and the Suwannee River. Since 1997, multiple factors including extreme drought, saltwater encroachment, and increased groundwater consumption have combined to cause a rapid deterioration in ecological health of Fanning Spring. Regulatory agencies have determined that the waters of Fanning Spring are impaired because of high levels of nitrogen and mercury and low levels of oxygen. During the period of record for Fanning, the spring has consistently had the poorest water quality of all the first magnitude springs in Florida. Submerged aquatic vegetation, once dominant in the spring and spring run, now covers less than 1% of the spring bottom, with the remaining 99% either bare or blanketed with nuisance filamentous algae. The mitigation of erosion and sedimentation sites in the park, restoration of Fanning Springs, and protection of the Fanning Springshed should remain top priorities for the Division. Although the water quantity/quality issues at Fanning Springs are complex, genuine improvements are still achievable. The following are hydrological assessment actions recommended for the park.

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 Suwannee 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. District staff will continue to monitor Environmental Resource Permit and Water Use Permit requests for the region in order to provide timely and constructive comments that 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 be essential to the decision making process during management planning. One activity worthy of DRP support is continued brownout monitoring and clarity tracking in the park's two major spring systems as part of the documentation of ecological responses to decreased spring discharge, Suwannee River flooding, and tidal fluctuations.

The proximal sources of groundwater flow from the Floridan aquifer to spring vents in the park are still unknown. In order for water managers to be able to protect water quality and potentially restore spring flows to their historic levels, they will need to know the extent of the springshed. To facilitate that process, the Division will seek funding for dye trace studies to determine the groundwater sources for spring systems in the park. Previous dye trace studies in the region (e.g., delineation of the Chiefland Sink connection to Manatee Spring) have provided park management with invaluable information about the various sources of spring water and the timing of surface water/groundwater interactions that potentially affect spring water quality.

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 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 staff will closely monitor any mining operations or large consumptive use permits in the Suwannee Basin or Fanning Manatee Springshed for significant changes that may adversely affect park resources.

The Division will continue to work closely with the SRWMD to ensure that MFLs developed for the Lower Suwannee River, including that for Fanning Spring, are monitored conscientiously and that historic river flows are protected, or restored if there is noncompliance with the MFL.

Objective: Restore natural hydrological conditions and functions to approximately 2 acres of spring-run stream and 7 acres of floodplain swamp/alluvial forest natural communities.

Action 1	Implement the final phases of the Fanning Spring Restoration Project
Action 2	Remove elevated causeways and spoil piles that impact the floodplain swamp/alluvial forest
Action 3	Evaluate and assess alterations to natural hydrology and initiate corrective actions if appropriate

Erosion on steep slopes above Fanning Spring has contributed to an accumulation of sediments in the spring over the years. In addition, causeways and spoil piles interrupt natural sheetflow through wetlands in the southern portion of the park. The following hydrological restoration actions are recommended for the park.

The DRP will implement the final phases of the Fanning Spring Restoration Project designed to improve erosion control around the spring, protect water quality, mitigate recreational pressures, and conserve the site as a warm water refugium for the federally endangered West Indian manatee.

The DRP will also develop and implement a restoration plan for the removal of elevated causeways and spoil piles that impact the floodplain swamp/alluvial forest in the southern portion of the park. Park staff will comply with best management practices to maintain the existing water quality on site and will take appropriate action to prevent soil erosion or other impacts to water resources.

Park and district staffs will evaluate other alterations in the park that may have negatively affected natural hydrology. If necessary, staff will initiate corrective actions such as the installation of low water crossings or culverts in appropriate locations.

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

Action 1	Investigate best management options for erosion mitigation in public access areas
Action 2	Develop and implement a restoration plan for the canoe launch area
Action 3	Monitor areas prone to erosion
Action 4	Implement corrective measures to reduce impacts of soil erosion on water resources

Several areas in the park continue to have erosion issues despite past corrective measures. The following are erosion control actions recommended for the park.

Park and district staffs will investigate best management options for additional mitigation of erosion in public access areas such as the slopes above Fanning Spring, Little Fanning Spring, and the canoe launch area along the Suwannee River. The DRP will develop and implement a restoration plan for the canoe launch area. In addition, the park will continue to remove feral hogs from the Little Fanning area in order to decrease soil disturbance there.

Staff will regularly monitor areas of the park that are prone to erosion. Additional water bars may need to be installed 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.

Natural Communities Management

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

As discussed above, 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 community improvements. Following are the natural community management objectives and actions recommended for the state park.

Prescribed Fire Management

Prescribed fire is used to mimic natural lightning-set fires, which are one of the primary natural forces that shaped Florida's ecosystem. Prescribed burning increases the abundance and health of many wildlife species. A large number of Florida's imperiled species of plants and animals are dependent on periodic fire for their continued existence. Fire-dependent natural communities gradually accumulate flammable vegetation; therefore, prescribed fire reduces wildfire hazards by reducing these wild land fuels.

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

Objective: Within 10 years, have 65 acres of the park maintained within the optimum fire return interval.

Action 1 Develop annual burn plan
Action 2 Burn between 6 – 40 acres annually, as identified in annual burn plan

Table 5 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 for acres to be burned.

Table 5: Prescribed Fire Management

Natural Community	Acres	Optimal Fire Return Interval (Years)
Upland Mixed Woodland	8.7	2-4
Successional Hardwood Forest	72	2-20
Annual Target Acreage*	6 – 40	
*Annual Target Acreage Range is based on the fire return interval assigned to each burn zone. Each burn zone may include multiple natural communities.		

The park is partitioned into management zones including those designated as burn zones (see Management Zones Table and Map). 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. Each annual burn plan is developed to support and implement the broader objectives and actions outlined in this ten-year management plan.

Most of the fire-type natural communities within the park have disappeared due to previous human impacts and fire suppression. Much of what was once upland mixed woodland is now mapped as successional hardwood forest. Scattered remnants of longleaf pine and southern red oak remain, however, located within patches of upland mixed woodland in poor condition. These areas are mapped as upland mixed woodland and have received limited prescribed fire as part of restoration efforts. Application of prescribed fire to portions of the successional hardwood forest is planned in an effort to increase habitat diversity and reduce fuel loads, and to help determine if future restoration of the upland mixed woodland community is feasible at these sites. Selective removal of offsite hardwoods such as laurel and water oaks will be used to complement and enhance prescribed fires in the upland mixed woodland and in selected portions of the successional hardwood forest. Both mechanical removal and selective herbiciding may be used on a case-by-case basis to speed the restoration process in the vicinity of remnant longleaf pines. Restoration of fire-type natural communities within the park could potentially provide habitat for species such as the gopher tortoise that have been displaced by the succession of upland mixed woodland to closed-canopy successional hardwood forest. The annual target burn acreage for Fanning Springs State Park is 6 to 40 acres.

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

Natural Communities Restoration

In some cases, the reintroduction and maintenance of natural processes is not enough to reach the natural community desired future conditions in the park, and active restoration programs are required. Restoration of altered natural communities to healthy, fully functioning natural landscapes often requires substantial efforts that 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.

Following are the natural community/habitat restoration and maintenance actions recommended to create the desired future conditions for upland mixed woodland in the park (see Desired Future Conditions Map).

Objective: Conduct habitat/natural community restoration activities on 8.7 acres of upland mixed woodland community

Action 1 Develop a site specific restoration plan
Action 2 Implement restoration plan

Fanning Springs State Park contains remnants of the upland mixed woodland natural community. That community is currently in poor condition because offsite hardwoods such as laurel oaks and sweetgums have invaded it to the extent that they now dominate the community. District staff will develop a restoration plan to guide the broad scale restoration of the park's upland mixed woodland over the long term. Park staff has already begun to remove offsite hardwoods in areas mapped as upland mixed woodland, particularly around longleaf pines, to improve conditions for subsequent prescribed fires. Removal of offsite hardwoods will be expanded to areas around southern red oaks, sand post oaks, and mockernut hickories using a combination of chemical and mechanical treatment. The park should burn the restoration areas more frequently during this restoration phase. Burning more frequently will help prevent an accumulation of excessive fuels, reduce fire intensity, and control the resprouting of hardwoods. This is the highest priority natural community restoration project in the park.

<u>Natural Communities Improvement</u>

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

Objective: Conduct natural community/habitat improvement activities on 63 acres of successional hardwood forest natural community.

Action 1 Survey successional hardwood forest to locate patches of remnant upland mixed woodland
Action 2 Remove offsite hardwoods in vicinity of remnant patches of upland mixed woodland
Action 3 Apply prescribed fire with adequate fuels

Legend

- MEH - Mesic Hammock 3.75 ac.
- UHF - Upland Hardwood Forest 70.56 ac.
- UMW - Upland Mixed Woodland 71.84 ac.
- AF - Alluvial Forest 6.61 ac.
- FS - Floodplain Swamp 5.41 ac.
- BST - Blackwater Stream 0.52 ac.
- SRST - Spring-Run Stream 3.2 ac.
- ACV - Aquatic Cave 0.017 ac.
- DV - Developed 25.71 ac.
- SHF - Successional Hardwood Forest 9.03 ac.

19

DV
SHF
UHF
BST
FS
SRST
UMW
ACV
UHF
AF
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FANNING SPRINGS STATE PARK

N

0 200 400 800 Feet

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

NATURAL COMMUNITIES
DESIRED FUTURE CONDITIONS
MAP

The historical extent of upland mixed woodland (UMW) at Fanning Springs is not completely known. Remnant species from this rare natural community are scattered through the successional hardwood forest in the park and need to be mapped more thoroughly to guide future restoration efforts. Therefore, district biological staff will survey areas currently identified as successional hardwood forest and will map locations of remnant longleaf pines, southern red oaks, mockernut hickories, sand post oaks and other plant species typical of upland mixed woodland. Park staff will then begin the long-term process of removing offsite hardwoods from the immediate surroundings of remnant UMW species, using a combination of chemical and mechanical treatments. Prescribed fire will be reintroduced to those areas if adequate fuels are present.

Imperiled Species Management

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

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

In the preparation of this management plan, DRP staff consulted with staff of the FWC's Imperiled Species Management 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 have an impact on imperiled species at the park.

Ongoing inventory and monitoring of imperiled species in the state park system is necessary to meet 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.

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

Additional surveys for imperiled plant and animal species are needed at Fanning Springs State Park to ensure that all imperiled species are documented. The DRP will enlist the assistance of academic researchers and staff from other agencies during development of species occurrence inventory lists, especially where necessary for certain taxonomic groups.

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

Action 1 Develop monitoring protocols for imperiled West Indian manatee
Action 2 Implement monitoring protocol for the West Indian manatee

District and park staffs will develop a written manatee protection plan to provide guidelines for the monitoring and management of manatees within the park. This plan will be an adaptive guidance document with specific protocols to modify visitor use of the main swimming area when a manatee enters.

Park staff cooperates with the FWC, USFWS, and USGS when reporting unusual manatee behavior and assists with manatee rescues or research (e.g., satellite tracking) on an as-needed basis. Year round, the park actively monitors manatee numbers in the spring run to ensure that visitors do not disrupt normal manatee behavior. Data collected include human/manatee interactions as well as changes in water levels and water clarity in the spring system.

The DRP will continue to coordinate and cooperate with its partners in the Fanning Springs Sediment Removal & Dock Modification project to implement the best strategies for continuing manage the Fanning Springs manatee population.

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

Action 1 Develop monitoring protocols for imperiled spiked crested coralroot
Action 2 Implement monitoring protocol for the imperiled spiked crested coralroot

Populations of spiked crested coralroot (*Hexalectris spicata*) occur in the upland hardwood forest. These populations need to be surveyed and documented, biennially if possible, to assess their condition and to detect the presence of any new populations that may have appeared in the park.

Exotic Species Management

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

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

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

Action 1 Annually develop and update exotic plant management work plan

Action 2 Implement the annual work plan by treating 3 acres in park and continuing maintenance and follow-up treatments as needed

The park will treat all known infestations of invasive exotic plants on an annual basis. Because the park currently has very few infestations, it will be extremely important to maintain this exotic-free condition. Survey for new exotic plant infestations becomes very important in a park that has achieved maintenance condition. Therefore, the entire park will be surveyed every five years. If new exotic plant infestations are found, they should be treated immediately. Floodplain areas in particular must be thoroughly surveyed to detect any new populations of Japanese climbing fern that might have taken hold, and treatment initiated before the fern becomes well established.

Objective: Implement control measures on 3 exotic animal species in the park.

Action 1 Continue control activities on feral hogs

Action 2 Relocate feral cats and stray dogs to the county animal control facility as necessary

The park will continue to remove nuisance and exotic animals on an as-needed basis. To date, the main problem species have been feral hogs, feral cats and feral dogs.

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 DRP's statutory responsibilities and an analysis of the park's resource needs and values. The long-term management goal for forest communities in the state park system is to maintain or re-establish old-growth characteristics to the degree practicable, with the exception of those communities specifically managed as early successional.

A timber management analysis was not conducted for this park since its total acreage is below the 1,000-acre threshold established by statute. Timber management will be re-evaluated during the next revision of this management plan.

Arthropod Control Plan

All DRP lands are designated as “environmentally sensitive and biologically highly productive” in accordance with Ch. 388 and Ch. 388.4111 Florida Statutes. If a local mosquito control district proposes a treatment plan, DRP works with the local mosquito control district to achieve consensus. By policy of FDEP since 1987, aerial adulticiding is not allowed, but larviciding and ground adulticiding (truck spraying in public use areas) is typically allowed. DRP does not authorize new physical alterations of marshes through ditching or water control structures. As of 2012, the park had no adopted mosquito control plan.

Sea Level Rise

Potential sea level rise is now under study and will be addressed by Florida’s residents and governments in the future. The DRP will stay current on existing research and predictive models, in coordination with other FDEP programs and federal, state, and local agencies. The DRP will continue to observe and document the changes that occur to the park’s shorelines, natural features, imperiled species populations, and cultural resources. This ongoing data collection and analysis will inform the Division’s adaptive management response to future conditions, including the effects of sea level rise, as they develop.

Additional Considerations

The Division has management authority over a 400-foot zone from the edge of mean high water along the Suwannee River where it passes through or alongside the park. Where emergent wetland vegetation exists, the zone extends waterward 400 feet beyond the vegetation. Within this zone, the park staff will enforce Division regulations. Pre-cut timber harvesting (dead head logging) is prohibited within this zone.

Fanning Springs State Park contains two aquatic natural communities of special concern, the spring-run stream and the aquatic cave system. Both are relatively rare in the state, are sensitive to disturbance, and provide essential habitat for imperiled species. While it is relatively short in length, the spring run has become increasingly important as a manatee refuge. Warm water refugia are critical habitats for manatees during cooler weather and are relatively rare in the northern parts of Florida. Fanning Springs is the second warm water refuge that manatees encounter when swimming up the Suwannee River from the Gulf of Mexico, some 34 miles away.

For this reason, unfettered manatee access to the spring run is imperative. To insure that manatees continue to utilize the spring and spring run without disturbance, it is recommended that motorized vessels be excluded from the spring run on a seasonal basis—particularly during winter months when manatees are seeking warm water refugia. The narrowness and shallow depth of the spring run increase the chances of motorized vessels accidentally hitting a manatee. Manatees

may also refuse to enter a warm water refuge if boats are present. Docking facilities are currently available on the Suwannee River; these allow traditional boat access to the park to continue during seasonal closures of the spring run. A similar balance between recreation and imperiled species protection has been achieved at nearby Manatee Springs State Park.

Open water divers utilize Fanning Spring for training and recreational diving. Carrying capacity for the number of divers utilizing the spring at one time is set at the discretion of the park manager according to DRP policies. Divers are not permitted to collect artifacts or harass wildlife while diving in the spring. Divers are encouraged to clean and check their equipment to ensure that it is free of any fragments of hydrilla before entering the spring.

Cultural Resource Management

Cultural Resource Management

Cultural resources are individually unique, and collectively, very challenging for the public land manager whose goal is to preserve and protect them in perpetuity. DRP is implementing the following goals, objectives and actions, as funding becomes available, to preserve the cultural resources found in Fanning Springs.

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

The management of cultural resources is often complicated because these resources are irreplaceable and extremely vulnerable to disturbances. The advice of historical and archaeological experts is required in this effort. All activities related to land clearing, ground disturbing activities, major repairs or additions to historic structures listed or eligible for listing in the National Register of Historic Places must be submitted to the FDOS, Division of Historical Resources (DHR) for review and comment prior to undertaking the proposed project. Recommendations may include, but are not limited to concurrence with the project as submitted, monitoring of the project by a certified archaeological monitor, cultural resource assessment survey by a qualified professional archaeologist, modifications to the proposed project to avoid or mitigate potential adverse effect. In addition, any demolition or substantial alteration to any historic structure or resource must be submitted to DHR for consultation and DRP must demonstrate that there is no feasible alternative to removal and must provide a strategy for documentation or salvage of the resource. Florida law further requires that 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 DHR.

Objective: Assess and evaluate 10 of 10 recorded cultural resources in the park.

Action 1 Complete 10 assessments and evaluations of archeological sites. Prioritize preservation and stabilization projects.

Action 2 Complete Historical Structures Report for historic buildings and cultural landscape. Prioritize preservation and restoration projects

The DRP will evaluate for significance any cultural site in the park that has not yet received an evaluation. Park staff will monitor all cultural sites periodically to ensure that they remain undisturbed.

The park will preserve the footprint of the Fort Fanning-Cedar Key Road (LV00618) by controlling vegetation that threatens to obliterate it and by protecting it from ground disturbance.

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

Action 1 Update and record all known sites within the Master Site File
Action 2 Conduct level I archeological survey for priority areas identified by predictive modeling when funds become available
Action 3 Conduct oral history interviews

The park staff has compiled some very interesting oral history and written documentation pertaining to the history of the area. The staff needs to determine what important gaps in history remain undocumented and attempt to obtain that information, particularly through oral interviews.

A Predictive Model and a Scope of Collections have already been completed for the park. All the current information should be organized so that it is available to future park staff.

Objective: Bring 1 of 10 recorded cultural resources into good condition.

Action 1 Design and implement regular monitoring programs for 7 cultural sites
Action 2 Create and implement a cyclical maintenance program for each cultural resource
Action 3 Bring McGrew Family Cemetery into good condition
Action 4 Bring Fort Fanning-Cedar Key Road into good condition

The DRP will bring the McGrew Family Cemetery (LV00539) into good condition. Because the boundaries of the cemetery are poorly defined at present, it is difficult to protect the site from ground disturbance. Therefore, determining the exact boundaries of the site will be a priority for the park. Accomplishing this will probably require methods such as ground penetrating radar.

In consultation with FDOT and DRP's Bureau of Natural and Cultural Resources, the park should develop a cyclical maintenance plan to keep the bridge span in good condition, free of lichens and other vegetative growth.

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

Fanning Springs State Park was not 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 (FDEP), Division of Recreation and Parks (DRP). These responsibilities are to preserve representative examples of original natural Florida and its cultural resources, and to provide outdoor recreation opportunities for Florida's citizens and visitors.

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

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

External Conditions

An assessment of 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 deal systematically with various planning issues such as location, regional demographics, adjacent land uses and park interaction with other facilities.

Fanning Springs State Park is located within Levy County, about 10 miles north of Chiefland in the north part of the state. The populations of Levy and the adjacent Dixie and Gilchrist counties have grown five percent since 2005, and are projected to grow an additional 20 percent by 2025 (BEBR, University of Florida 2014). As of 2012, 19 percent of residents in these counties were in the 5-19 age group, 44 percent in the 20-54 age group, 19 percent in the 65+ age group, and 16 percent were aged 65 and over, which reflects the state average for these groupings (BEBR, University of Florida, 2014). Nearly 480,000 people reside within 50 miles of the park, which includes the cities of Fanning Springs, Chiefland, Cross City, and Gainesville. (Census 2010).

Significant recreational opportunities exist along the Suwannee River corridor north and south of the park. Public lands including the Nature Coast State Trail State Park, Andrews Wildlife Management Area, Manatee Springs State Park, and the Lower Suwannee National Wildlife Refuge exist within a short driving distance of Fanning Springs. Camping, hiking, swimming, picnicking, bicycling and hunting are the main recreational pursuits on these public lands. On the west, the park is defined by the Suwannee River, which is heavily used for recreational boating, fishing and personal watercraft. The SRWMD owns several tracts of land along the river. With Fanning Springs acting as a hub for the Suwannee River Wilderness Trail, an increase in recreation on the river as well as in the park is expected.

Existing Use of Adjacent Lands

Fanning Springs is located in northwestern Levy County, on the east bank of the Suwannee River, within the city limits of Fanning Springs. Fort Fanning, a small residential area is adjacent to the southwestern portion of the park, along the Suwannee River. Additional residential development parallels Old Fanning Road, on the park's eastern side. Mixed-use and commercial development exists north of the park, along U.S. Highway 19/98. Ft. Fanning Historical Park, managed by the city of Fanning Springs, is located along the Suwannee River on the north side of U.S. Highway 19/98 just across from the wayside park. The 200-foot right of way and four-lane U.S. Highway 19/98 is the largest adjacent land use to the park. No major improvements to that highway are scheduled in the current FDOT Five Year Plan.

Planned Use of Adjacent Lands

Development on the land uses adjacent to Fanning Springs is generally planned to remain at the current level. Land use and zoning restrictions on the residential lots on the southern boundary will hold future development to densities that are not incompatible with the park's resources, although the acquisition of undeveloped lots is recommended to avoid additional development. Future residential development along Old Fanning Road to the east and south of the park is not expected to create appreciable impacts on the state park. The primary effects of adjacent land uses on the park derive from the heavy recreational uses of the river for boating, fishing, jet skiing, canoeing and kayaking. Large numbers of boats and personal watercraft enter the spring run from the river and active management is necessary to provide protection for the manatee populations within this region. Future increases in the recreational boating population should be expected (City of Fanning Springs 2011).

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

Over 174 of the park's 204 acres consist of natural landscapes typical of the Suwannee River floodplain, and historically significant lands, showing evidence of human usage over more than a thousand years. The upland natural communities of this park include upland hardwood forest, upland mixed woodland and mesic hammock, which provide for resource based recreation and wildlife habitat. The park lies within 50 miles of nearly 480,000 Florida residents, and is easily accessible to tourists traveling on U.S. Highway 19/98.

Water Area

The park is located along the Suwannee River, an Outstanding Florida Water and possibly Florida's most famous river. It provides a tremendous recreational and ecological resource to those people located within its watershed. Two springs, Fanning and Little Fanning, flow into the Suwannee from the park.

Shoreline

Almost two-thirds of a mile of Suwannee River shoreline is contained within the park. Within the park's boundaries, the Suwannee River shoreline includes several bluffs, providing exceptional views. The shoreline near the springs however is significantly lower and provides for access to the river during the dryer seasons.

Natural Scenery

The springs and the Suwannee River are the primary visual resources of this park. The best views of the river are from the picnic area and floating dock at the wayside rest area and from the scenic overlook just to the west of Fanning Spring. Views of Fanning Springs can be enjoyed from the picnic area, swimming platforms, and the observation platform adjacent to the education building.

Significant Habitat

With Fanning Springs being located on the Suwannee River and containing two springs, significant wildlife habitat abounds. Over 11 natural communities and altered land cover types exist within the boundaries of the state park and support a diversity of species, including several that are state or federally listed. Among the most significant listed species found at the park is the West Indian manatee. Gulf sturgeon, gopher tortoises, and the Suwannee cooter are also

found within the park boundaries. All designated species will be protected under established Division management policies, and visitor impacts to listed species carefully monitored to identify potential impacts in advance.

Natural Features

The two springs, Fanning Spring and Little Fanning Spring, are the most significant natural features in the park. Fanning Spring is a first magnitude spring, and discharges a relatively large volume of water. It has a funnel shaped vent, with a spring run approximately 100 feet wide, and 400 feet long. The spring pool is about 20 feet deep. The surrounding land has a relief of 10 - 30 feet with rather steep banks. Several smaller seepage springs are known to flow into the Fanning Spring run. Recreational activity, mainly swimming, is centered on this spring.

Little Fanning Spring is a second magnitude spring, located approximately 500 feet south of Fanning Spring. It flows in a southwesterly direction before emptying into the Suwannee River. Water levels and discharges in both springs fluctuate dramatically depending on precipitation and tidal activity.

Archaeological and Historical Features

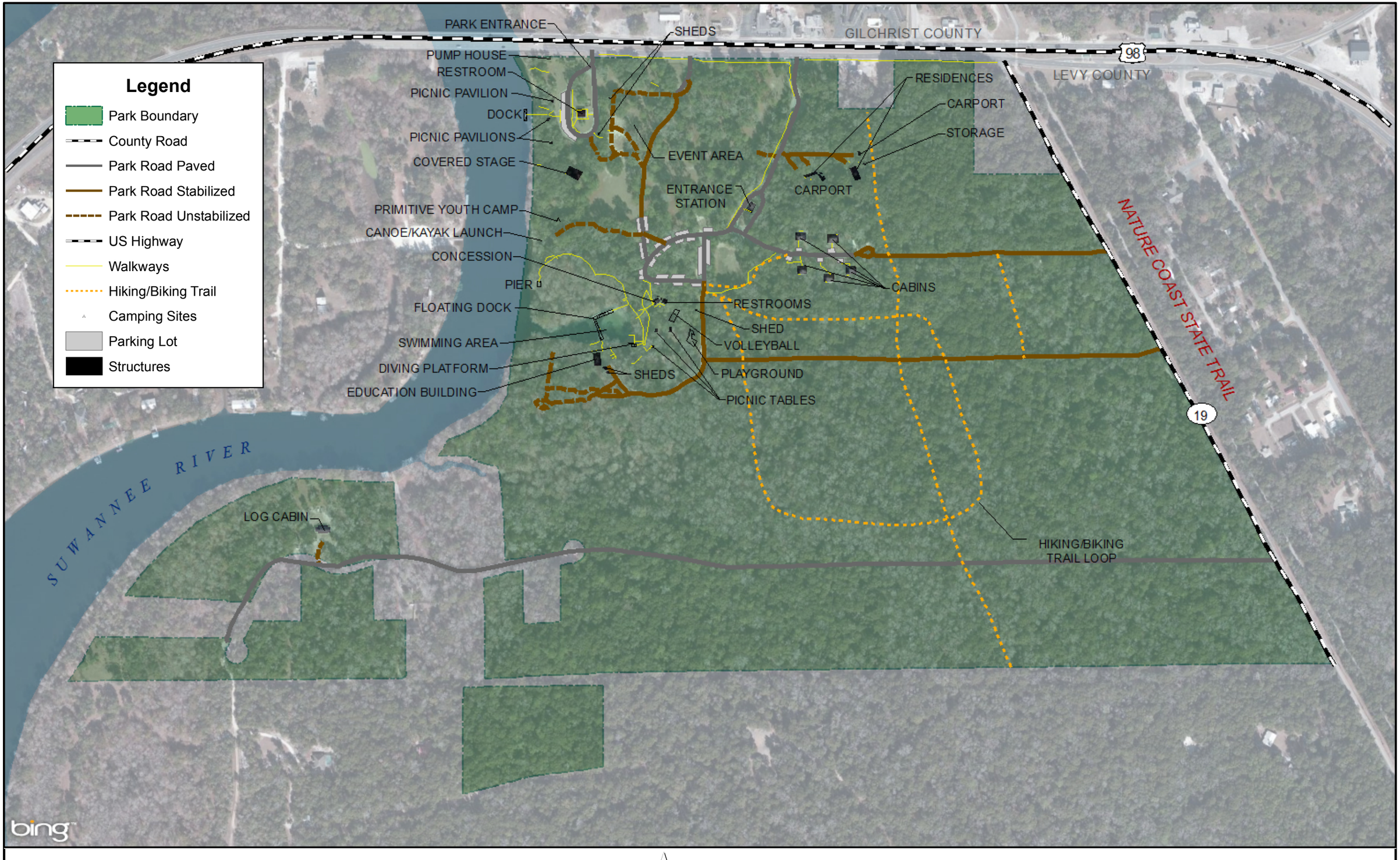
Human beings have used the Suwannee River and its surrounding environment for thousands of years. The park contains numerous significant prehistoric and historic cultural resources. This cultural record provides abundant opportunities for interpretive programming.

Assessment of Use

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

Past Uses

Fanning Springs has been occupied since pre historic times. Since the late 19th and early 20th centuries, Fanning Springs has served as a recreation center for the local communities. During the first three decades of the twentieth century, a resort that included a motel, dance & skating pavilion, bowling alley, bathhouse and snack bar was developed around Fanning Spring. During the 1960s, the property was owned by Mr. Bell (of Taco Bell restaurant fame). It was during this period that the old buildings on the property were bulldozed. In the late 1960s and early 1970s, a commune “homesteaded” on the property. The Crossroads Church of Christ acquired the property in the mid-70s, intending to turn the property into a religious retreat. The state purchased the property in 1993 and leased it to the Office of Greenways and Trails. Management was transferred to the DRP in 1997. The Florida Department of Transportation developed the wayside park and its facilities along the banks of the Suwannee, as a rest area for drivers on U.S. Highway 19/98. Since 1997, the wayside park has been managed by the DRP as an integral part of Fanning Springs State Park.



FANNING SPRINGS STATE PARK

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

BASE MAP

Future Land Use and Zoning

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

The future land use designation for Fanning Springs State Park is low density residential with a density of two dwelling units or less per acre. The zoning designation is single-family residential (City of Fanning Springs 2011). Both of these designations are consistent with state park uses and facilities.

Current Recreational Use and Visitor Programs

Picnicking and swimming are the traditional recreational activities at Fanning Springs. A food concession is available for visitors at the swimming area. A nature trail is currently provided east of the springs. Paddling, boating and fishing are popular activities in the Suwannee River along the park shoreline. Five cabins are available for overnight stays. Special events are held at the covered stage on the banks of the river. The stage is available for use by surrounding communities to host their own programs and events in partnership with the park.

Fanning Springs State Park recorded 218,963 visitors in FY 2015/2016. By DRP estimates, the FY 2015/2016 visitors contributed $19 million in direct economic impact, the equivalent of adding 304 jobs to the local economy (FFDEP 2016).

Other Uses

Six's Camp Road, a stabilized road associated with the three Fort Fanning residences on the parks' southwestern boundary, is the only permanent non-park use within the park boundaries. A log cabin is located on the river in the southwestern portion of the park. It is currently being used as a support facility for maintenance activities on the Nature Coast State Trail.

Protected Zones

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

At Fanning Springs State Park, all wetland communities including the springs, spring runs, alluvial forest, floodplain swamp, blackwater streams, and upland

mixed woodland communities have been designated as protected zones as delineated on the Natural Communities Map. The park's current protected zones are delineated on the Conceptual Land Use Plan.

Existing Facilities

Most of the park's recreational facilities are located in the spring swimming/ picnic area and the wayside picnic area. Overnight facilities are located in the cabin area and primitive camping area. The nature trail/interpretive loop trail begins at the trailhead area. Special events are located in the event area and supported by a covered stage. The primary support facilities include a ranger station, ranger residences, storage buildings and service roads (see Base Map).

Recreation Facilities

Spring Swimming and Picnic Area
Concession building (1)
Education/conference building (1)
Restroom
Small picnic shelters (3)
Picnic tables and grills (10)
Playground
Swimming platform/deck (3)
Floating dock
Parking (105 spaces)

Wayside Picnic Area
Small picnic shelters (3)
Picnic tables and grills (5)
Restroom
Boat dock
Parking (25 spaces)

Event Area
Covered stage

Cabin Area
Cabins (5)

Primitive Camping Area

Trailhead Area
Nature trail (.8 mi.)

Support Facilities
Ranger station
Staff residences (2)
Storage sheds (6)
Service roads (2 mi.)
Log cabin

Conceptual Land Use Plan

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

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

Potential Uses

Public Access and Recreational Opportunities

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

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

***Objective: Maintain the park's current recreational carrying capacity of 1086 users per day*.**

The park will continue to provide opportunities for swimming, picnicking, cabin lodging, primitive camping, paddling, boating, and nature/interpretive walks. Special events will continue to be offered on a regular basis.

Objective: Expand the park's recreational carrying capacity by 98 users per day.

The Town of Fanning Springs is one of seven hubs of the Suwannee River Wilderness Trail, making the Fanning Springs State Park a destination for multiday paddling trips between the Town of White Springs and the Town of Suwannee, near the Gulf of Mexico. Cabin camping opportunities will be expanded in the park by providing additional vacation cabins. Boating and paddling opportunities will be expanded with the addition of a floating dock and canoe/kayak launch on the Suwannee River. Picnic opportunities will be expanded with the addition of a picnic shelter at the wayside park.

Objective: Continue to provide the current repertoire of 3 interpretive, educational and recreational programs on a regular basis.

Two guided tours are offered on alternating Saturdays fall through spring and by request year round. The "A Walk with Nature Hike", follows the existing nature trail and highlights the park's upland plant communities and wildlife, sinkholes, and cultural history. The second program is a staff-led walk to Little Fanning Springs provided to lodging guests. The pristine beauty of a natural and undisturbed spring setting is featured. A third program is offered by a staff member who roams the park with an open box labeled "Look What I Have." In the box is a photograph or object/artifact that relates to some aspect of the park's natural or cultural history. The object is interpreted to all interested visitors. This program is offered once a week throughout the year.

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

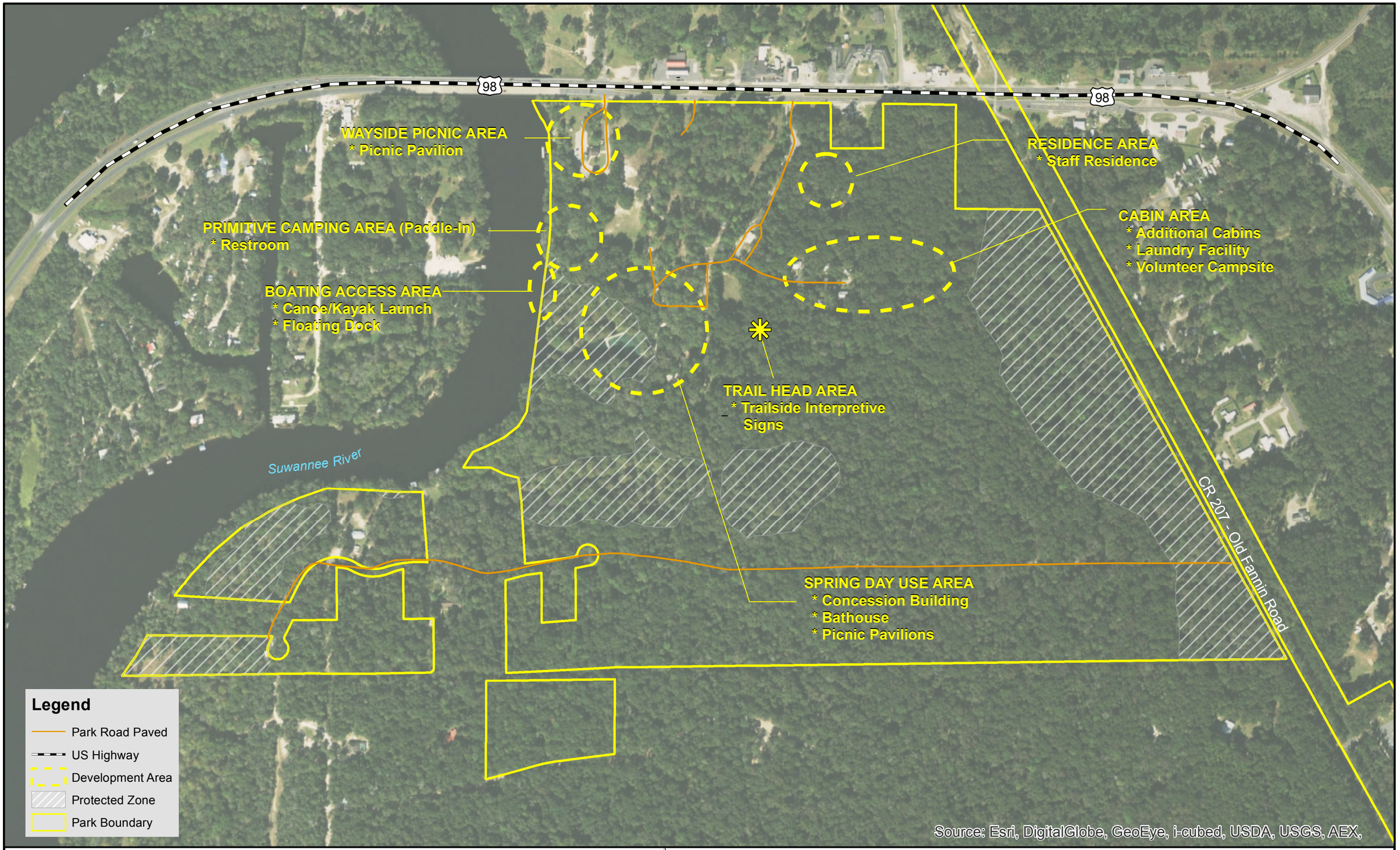
It is recommended that a self-guided interpretive program be established for the existing nature trail. Trailside signage along the trail would address important interpretive themes related to the natural and cultural history of the park.

Proposed Facilities

Capital Facilities and Infrastructure

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

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



FANNING SPRINGS STATE PARK

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

CONCEPTUAL LAND USE PLAN

Objective: 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: Improve/repair 7 existing facilities.

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

Spring Day Use Area: A section of the boardwalk and a set of stairs between the swimming area and the education/conference building will be removed to better control visitor circulation and access. A new bathhouse and concession building will be constructed to meet current DRP standards. The proposed location of these buildings is further to the east, closer to the existing service road and further away from the steep slopes above the spring. The education/conference building, currently being used by a canoe/kayak concession, should be upgraded and improved to accommodate expanded public use. The existing picnic shelters should be replaced with one large, one medium, and two small pavilions.

Cabin Area: Five of the 10 cabins that were proposed in the last unit management plan have been constructed. Due to their popularity and high occupancy rate, it is recommended that the remaining five cabins be constructed during this planning period. A cabin support area, including a laundry facility and a volunteer campsite, should be provided here.

Wayside Picnic Area: One of the three existing picnic shelters should be upgraded to achieve full accessibility or one new ADA accessible structure should be constructed here. The parking lot should be retrofitted for better stormwater management. Currently, this area has its own entrance on U.S, Highway 19. The feasibility of closing this entrance and directing all visitors to enter through the main entrance should be explored as a way to generate more revenue for the park.

Residence Area: The staff mobile home residence should be replaced with a permanent structure.

Primitive Camping Area: This area serves a dual purpose by providing primitive camping for up to four small parties (4 sites) at a time. The entire area can also be reserved for groups with priority given to youth organizations. A small restroom should be provided next to the nearby covered stage to serve both the primitive camping area and the special events area.

Trailhead Area: Trailside signs should be added along the existing nature trail to provide a self-guided interpretive experience for park visitors.

Special Events Area: A wide buffer of native vegetation should be planted along the northern boundary to screen the events area from Highway 19/98.

Objective: Construct 1 new facility.

Boating Access Area: The discontinued boat ramp (concrete has been removed) on the river north of the Big Fanning Springs run needs to be reconstructed to serve a dual purpose as a canoe/kayak launch and floating dock facility. The floating dock should be of such a size that 6-8 boats can tie up to it. The launch/landing and floating dock will allow better access to and from the Suwannee River for the various individuals, groups and outfitters using the park as a hub for an experience on the Suwannee River Wilderness Trail and for visitors to the state park. The floating dock will serve park visitors year round and will allow boaters to tie up and have access to the spring when the spring run is closed during the winter months.

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:

Recreation Facilities

Spring Day Use Area
Concession building
Bathhouse
Picnic pavilions (1 large, 1 medium, 2 small)

Cabin Area
Cabins (5)

Trailhead Area
Trailside interpretive signs (10)

Wayside Picnic Area
Picnic pavilion (1)

Primitive Camping Area
Restroom

Boating Access Area
Floating Dock
Canoe/kayak launch

Support Facilities

Residence Area
Staff residence (1)

Cabin Area
Volunteer campsite (1)
Laundry facility

Recreational Carrying Capacity

Carrying capacity is an estimate of the number of users a recreation resource or facility can accommodate and still provide a high quality recreational experience and preserve the natural values of the site. The carrying capacity of a unit is determined by identifying the land and water requirements for each recreation activity at the unit, and then applying these requirements to the unit's land and water base. Next, guidelines are applied which estimate the physical capacity of the unit's natural communities to withstand recreational uses without significant degradation. This analysis identifies a range within which the carrying capacity most appropriate to the specific activity, the activity site and the unit's classification is selected (see Table 6).

The recreational carrying capacity for this park is a preliminary estimate of the number of users the unit could accommodate after the current conceptual development program has been implemented. When developed, the proposed new facilities would approximately increase the unit's carrying capacity as shown in Table 6.

Table 6. Recreational Carrying Capacity

	Existing Capacity*		Proposed Additional Capacity		Estimated Recreational Capacity	
Activity/Facility	One Time	Daily	One Time	Daily	One Time	Daily
Picnicking (Wayside)	12	24	4	8	16	32
Picnicking/Swimming	450	900			450	900
Primitive Camping	32	32			32	32
Cabins	30	30	30	30	60	60
Nature Trails	10	40			10	40
Canoeing/Kayaking			20	40	20	40
Boating	30	60	10	20	40	80
TOTAL	**564**	**1086**	**64**	**98**	**628**	**1184**

*Existing capacity revised from approved plan according to DRP guidelines.

Optimum Boundary

The Optimum Boundary map reflects lands considered desirable for direct management by the DRP as part of the state park. These parcels may include public or privately owned land that would improve the continuity of existing parklands, provide the most efficient boundary configuration, improve access to the park, provide additional natural and cultural resource protection or allow for future expansion of recreational activities. Parklands that are potentially surplus to the management needs of DRP are also identified. As additional needs are

identified through park use, development, and research, and as land use changes on adjacent property, modification of the park's optimum boundary may be necessary.

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

The optimum boundary for Fanning Springs includes approximately 400 acres. The acquisition of inholdings along the northern and southern boundaries would improve park operations and management. The majority of the property within the optimum boundary is south of the park. This acquisition would more than double the size of the park and enhance the park's resource base, allowing for potential future expansion of recreational facilities. The connection with Andrews Wildlife Management Area to the south would be a valuable expansion and enhancement the existing corridor of conservation lands along the Suwannee River (see Optimum Boundary Map).

FANNING SPRINGS STATE PARK

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Florida Department of Environmental Protection
Division of Recreation and Parks
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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 approval of the last management plan for Fanning Springs State Park in 2004, significant work has been accomplished and progress made towards meeting the DRP's management objectives for the park. These accomplishments fall within three of the five general categories that encompass the mission of the park and the DR

Park Administration and Operations

- Since 2003 approximately 285,000 volunteer hours have been contributed to the park to assist with park maintenance, visitor services, administration, interpretation, protection and resource management activities.
- Obtained FDEP Springs Initiative funds to hire a springs educational outreach coordinator (Springs Ambassador).
- Obtained FWC/FDEP funds to hire a coordinator to facilitate the Fanning and Manatee Springs Working Group.
- Organized developed and implemented Fanning Springs Garden Festival (Earth Day Celebration in 2012) with a focus primarily upon spring education and protection within its springshed. Several vendors and workshops by University of Florida Master Gardeners including Florida-Friendly Landscaping were provided.
- Acted as host location and assisted with site preparation and incidental support for the following events: Fanning Springs Festival of Lights and Evening Boat Parade; Red Belly Days sponsored by Dixie County Chamber of Commerce; 'Step up Florida'; Boy Scout camp; Jam Stock music festival; Parking for Bike Florida Ride; Impact Christian Music event; overnight stop for Paddle Florida; Easter Egg Hunts sponsored by City of Fanning Springs; and Native American Rendezvous.

Resource Management

Natural Resources

- Park staff and FDEP conducted and monitored Fanning Springs for several water quality and ecological health parameters in a statewide spring study called Ecosummary.
- Suwannee River Water Management District (SRWMD)/United States Geological Survey (USGS) has monitored daily spring discharge at a permanent satellite telemetry station at Fanning Springs.
- Obtained FDEP Springs Initiative/SRWMD funds to conduct a sediment removal project within the main headspring.
- Obtained FDEP/Florida Geological Survey (FGS) funds to implement a geophysical study that further delineated the Fanning Springshed.
- Obtained FDEP Springs Initiative funds to build educational kiosks at the wayside picnic area and the spring day use area that highlight the Fanning springshed. This funding also allowed park staff to construct a demonstration permeable walkway.
- Obtained FDEP Springs Initiative funds to print a "Let's Protect Fanning Springs" brochure.
- Implemented vegetation/erosion restoration activities to stabilize the canoe launch area on the Suwannee River.
- Implemented the first-ever recorded prescribed burns at Fanning, treating nearly 9 acres of a state endangered upland ecosystem called upland mixed woodland community.
- Park staff designed and implemented Fanning Spring shoreline erosion and vegetation restoration project. This project improved children's swimming area access through installation of a ramp to stabilize specific portions of the headspring shoreline undergoing severe erosion.
- Monitored daily spring water clarity in Fanning and Little Fanning Springs.
- Conducted a Fanning Spring and spring run submerged aquatic vegetation and bathymetric sediment analysis.
- The park entered into a multi-agency partnership including FDEP, SRWMD, FWC, United States Fish and Wildlife Service (USFWS) and The Nature Conservancy to receive funds to implement a manatee (*Trichechus manatus*) habitat restoration project including sediment removal and floating dock modifications within Fanning Springs headspring and spring run.
- Continued support for freshwater turtles monitoring in Fanning Springs System.
- Conducted Rapid Periphyton Surveys (RPS) to monitor and characterize algae loads at Fanning Springs.
- Continued exotic removal program, treating up to 10 Category I exotic plant species including significant threats such as Japanese climbing fern, cogon grass and air potato and removed approximately 50 feral hogs from the park
- Participated in the rescue of an injured manatee in 2012.
- Continuous documentation of manatee sightings by park staff since 1998.

Cultural Resources

- The park underwent a cultural resource Predictive Model Assessment in 2011. The outcome of the predictive model assessment will be used to further understand the placement of protected zones in the park.
- Park staff put in extensive hours of research, documentation, and reporting to Florida Division of Historical Resources concerning numerous newly recorded cultural sites on the park including the Barrow Homestead Sawmill Site.
- Park managed cultural resource items for Division of Historical Resources during Fanning Springs sediment removal project in 2002 and 2011.
- Park participated in the ASCAP trial survey of known sites in 2014.

Park Facilities

- The park obtained FDEP Springs Initiative funds to reconfigure existing plumbing to accommodate five purchased waterless urinals.
- Obtained FDEP Springs Initiative funds for septic tank upgrades. Two septic drain fields were installed at remote locations from river and spring. Aerobic units and needed lift stations were part of installation. Drain fields located in positions close to the road so that, if a community treatment plant is installed in the future park will be able to connect with minimal expenditure.
- Obtained FDEP Springs Initiative funds to conduct water quality testing of 4 aerobic OSTDS systems.
- Constructed five rental cabins for overnight lodging.
- Obtained FDEP Springs Initiative funds to stabilize and restore with native vegetation the highest traffic areas on the upper slope around Fanning head-spring.
- Obtained FDEP Springs Initiative funds to implement an erosion control project that would protect the sensitive spring shoreline and improve access to children's swimming area, including installation of a new aluminum ramp system and vegetation restoration.

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 7) 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 7 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	**$423,000**
Objective B	**Expand administrative support as new lands are acquired, new facilities are developed, or as other needs arise.**	Administrative support expanded	UFN	**$132,000**
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	**Conduct/obtain an assessment of the park's hydrological needs.**	Assessment conducted	UFN	**$41,000**
Action 1	Continue to cooperate with other agencies and independent researchers regarding hydrological research and monitoring programs.	Cooperation ongoing	C	$3,500
Action 2	Continue monitoring of surface and ground water quality at Fanning Springs and the tracking of water quality changes within this system.	Monitoring ongoing	C	$3,700
Action 3	Pursue funding for dye trace studies of the Fanning Springs Springshed	Funding acquired	ST	$800
Action 4	Conduct dye trace studies of the Fanning Springs region for springshed delineation	Project completed	UFN	$30,000
Action 5	Continue to monitor land use or zoning changes around the park's resources.	Monitoring ongoing	C	$1,000
Action 6	Continue to cooperate with the SRWMD to ensure MFLs for Fanning Spring are monitored for compliance in order to maintain historic river flows.	Cooperation ongoing	C	$2,000
Objective B	**Restore natural hydrological conditions and functions to approximately 2 acres of spring-run stream and 7 acres of floodplain swamp/alluvial forest natural communities**	# Acres restored or with restoration underway	UFN	**$39,000**
Action 1	Implement the final phases of the Fanning Spring Restoration Project	Project completed	UFN	$17,000
Action 2	Remove elevated causeways and spoil piles that impact the floodplain swamp/alluvial forest	Project completed	UFN	$21,000
Action 3	Evaluate and assess alterations to natural hydrology and initiate corrective actions if appropriate	Assessment complete	ST	$1,000
Objective C	**Evaluate and mitigate the impacts of soil erosion in the park**	Monitoring ongoing	C	**$9,600**
Action 1	Investigate best management options for erosion mitigation in public access areas	Coordination ongoing	C	$2,000
Action 2	Develop and implement a restoration plan for the canoe launch area	Plan implemented	UFN	$5,800
Action 3	Monitor areas prone to erosion	Areas monitored	C	$900
Action 4	Implement corrective measures to reduce impacts of soil erosion on water resources	Measures implemented	UFN	$900

* 2015 Dollars
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C = long term or short term actions that are continuous or cyclical
UFN = currently unfunded need

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Goal III: Restore and maintain the natural communities/habitats of the park.		Measure	Planning Period	Estimated Manpower and Expense Cost* (10-years)
Objective A	**Within 10 years have 65 acres of the park maintained within optimal fire return interval.**	# Acres within fire return interval target	LT	**$36,000**
Action 1	Develop/update annual burn plan.	Plan updated	C	$16,000
Action 2	Manage fire dependent communities for ecosystem function, structure and processes by burning between 6 - 40 acres annually, as identified by the annual burn plan.	Average # acres burned annually	C	$20,000
Objective B	**Conduct habitat/natural community restoration activities on 8.7 acres of upland mixed woodland community**	# Acres restored or with restoration underway	C	**$12,000**
Action 1	Develop/update site specific restoration plan	Plan developed/updated	ST	$500
Action 2	Implement restoration plan	# Acres with restoration underway	UFN	$11,500
Objective C	**Conduct natural community/habitat improvement activities on 63 acres of successional hardwood forest natural community**	# Acres improved or with improvements underway	UFN	**$14,000**
Action 1	Survey successional hardwood forest to locate patches of remnant upland mixed woodland	Survey completed	ST	$1,000
Action 2	Remove offsite hardwoods in vicinity of remnant patches of upland mixed woodland	Treatment completed	UFN	$10,000
Action 3	Apply prescribed fire with adequate fuels	Treatment completed	C	$3,000
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/ update baseline imperiled species occurrence inventory lists for plants and animals, as needed.**	List updated	C	**$2,000**
Objective B	**Monitor and document 1 selected imperiled animal species in the park.**	# Species monitored	C	**$4,000**
Action 1	Develop monitoring protocols for imperiled West Indian manatee	Protocols developed	C	$3,000
Action 2	Implement monitoring protocols for imperiled West Indian manatee	Protocols implemented		$1,000
Objective C	**Monitor and document 1 selected imperiled plant species in the park.**	# Species monitored	C	**$1,400**
Action 1	Develop monitoring protocols for 1 selected imperiled plant species including spiked crested coralroot	Protocols developed	ST	$800
Action 2	Implement monitoring protocols for 1 including those listed in Action 1 above.	Protocols implemented	C	$600

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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 acres of exotic plant species in the park.**	# Acres treated	C	**$33,000**
Action 1	Annually develop/update exotic plant management work plan.	Plan developed/updated	C	$16,000
Action 2	Implement annual work plan by treating 3 acres in park, annually, and continuing maintenance and follow-up treatments, as needed.	Plan implemented	C	$17,000
Objective B	**Implement control measures on 3 exotic and animal species in the park.**	# Species for which control measures implemented	C	**$20,000**
Action 1	Continue control activities on feral hogs	Measures implemented	C	$20,000
Action 2	Relocate feral cats and stray dogs to the county animal control facility as necessary	Measures implemented	C	$0
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 7 of 7 recorded cultural resources in the park.**	Documentation complete	LT	**$5,000**
Action 1	Complete 7 assessments/evaluations of archaeological sites. Prioritize preservation and stabilization projects.	Assessments complete	LT	$1,500
Action 2	Complete Historical Structures Report for historic buildings and cultural landscape. Prioritize preservation and restoration projects	Reports and priority lists completed	UFN	$3,500
Objective B	**Compile reliable documentation for all recorded historic and archaeological sites.**	Documentation complete	LT	**$13,000**
Action 1	Ensure all known sites are recorded or updated in the Florida Master Site File.	# Sites recorded or updated	ST	$2,600
Action 2	Conduct level I archaeological survey for priority areas identified by predictive modeling when funds become available		UFN	$7,400
Action 3	Conduct oral history interviews.	Interviews complete	UFN	$3,000

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Objective C	**Bring 1 of 7 recorded cultural resources into good condition.**	# Sites in good condition	UFN	**$9,000**
Action 1	Design and implement regular monitoring programs for 7 cultural sites	# Sites monitored	C	$2,000
Action 2	Create and implement a cyclical maintenance program for each cultural resource.	Programs implemented	C	$5,000
Action 3	Bring McGrew Family Cemetery into good condition	Assessment completed	UFN	$1,000
Action 4	Bring Fort Fanning-Cedar Key Road into good condition	Assessment completed	UFN	$1,000
Goal VII: Provide public access and recreational opportunities in the park.		**Measure**	**Planning Period**	**Estimated Manpower and Expense Cost* (10-years)**
Objective A	**Maintain the park's current recreational carrying capacity of 1086 users per day.**	# Recreation/visitor	C	**$423,000**
Objective B	**Expand the park's recreational carrying capacity by 338 users per day.**	# Recreation/visitor	UFN	**$132,000**
Objective C	**Continue to provide the current repertoire of 3 interpretive, educational and recreational programs on a regular basis.**	# Interpretive/education programs	C	**$15,000**
Objective D	**Develop 1 new interpretive, educational and recreational programs.**	# Interpretive/education programs	UFN	**$10,000**
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	**$473,000**
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	LT	**$200,000**
Objective C	**Improve and/or repair 7 existing facilites as identified in the Land Use Component.**	# Facilities	UFN	**$3,300,000**
Objective D	**Construct 1 new facility as identified in the Land Use Component.**	# Facilities	UFN	**$400,000**
Objective E	**Expand maintenance activities as existing facilities are improved and new facilities are developed.**	Facilities maintained	C	**$400,000**

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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.

Summary of Estimated Costs

Management Categories		Total Estimated Manpower and Expense Cost* (10-years)
Resource Management		**$239,000**
Administration and Support		**$555,000**
Capital Improvements		**$3,900,000**
Recreation Visitor Services		**$1,453,000**
Law Enforcement Activities[1]		
	1Law enforcement activities in Florida State Parks are conducted by the FWC Division of Law Enforcement and by local law enforcement agencies.	

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

Addendum 1—Acquisition History

Purpose of Acquisition:

The Trustees acquired Funning Springs State Park to protect the springs from the effects of commercial, residential, and agricultural runoff as well as to protect them from clear cutting and mining so that all Floridians and visitors will be able to enjoy these springs for years to come.

Sequence of Acquisition:

On December 3, 1993, the Trustees acquired title to an approximately 184-acre property in Levy County, Florida, constituting the initial area of Fanning Springs State Park. The property was purchased from E. T. Usher, Ken D. & Lynetta U. Griner, Helen H. Usher, and NACEP, Inc. for $2, 255,160. This purchase was made under the Conservation and Recreation Lands (CARL) program, and the program was funded through the Preservation 2000 (P2000).

Since the 1993 initial purchase, the Trustees have acquired additional parcels through purchases under P2000 Additions and Inholdings (A&I) and donations and added these newly acquired properties to Fanning Springs State Park. The current area of the park is 198.37 acres.

Title Interest:

The Trustees holds fee simple title to Fanning Springs State Park.

Lease Agreement:

On July 20, 1994, the Trustees leased Fanning Springs State Park to the State of Florida Department of Environmental Protection, Office of Greenway and Trails, under a fifty (50) year lease, Lease No. 4039. On February 27, 1997, the Office of Greenways and Trails released its leasehold interest it had maintained in Fanning Springs State Park under Lease No. 4039.

On March 10, 1997, the State of Florida Department of Environmental Protection, Division of Recreation and Parks (DRP), leased Fanning Springs State Park from the Trustees under a new fifty (50) -year term lease, Lease No. 4142. This lease will expire on March 9, 2047.

According to Lease No. 4142, DRP manages Fanning Springs State Park only for conservation and protection of natural and historical resources and for resource based public outdoor recreation which is compatible with the conservation and protection of the property.

Special Conditions on Use:

Fanning Springs State Park is designated as a single-use property to provide resource-based public outdoor recreation and other park related uses. Uses such as water resource development projects, water supply projects, storm-water

management projects, and linear facilities and sustainable agriculture and forestry are not consistent with the primary purpose for which DRP manages the park.

Outstanding Reservations:

Type of Instrument:	Warranty Deed
Grantors:	Manuel A. Ross and Mary Ann Ross
Grantee:	Trustees
Beginning Date:	February 15, 2001
Ending Date:	Perpetuity
Outstanding Rights/restrictions:	The deed is subject to utility easements and minimum set back requirement as recorded in plat book 6, page 35. The deed is also subject to declaration of covenants, conditions, and restrictions of Little Fanning as recorded in record book 186, page 356. Both documents were recorded in Levy County, Florida.

Type of Instrument:	Warranty Deed
Grantors:	Gene Deloin Ratcliff et al.
Grantee:	Trustees
Beginning Date:	October 30, 1995
Ending Date:	Perpetuity
Outstanding Rights/restrictions:	The deed is subject to utility easements as recorded in plat book 6, page 35; declaration of covenants, conditions, and restrictions of Little Fanning as recorded in record book 186, page 356; and Declaration of Restrictions as recorded in ORB 176, Page 464, all in Levy County, Florida.

Type of Instrument:	Warranty Deed
Grantor:	Helen H. Usher
Grantee:	Trustees
Beginning Date:	December 3, 1993
Ending Date:	Perpetuity
Outstanding Rights:	The deed is subject to utility easements as recorded in plat book 6, page 35, and declaration of covenants, conditions, and restrictions of Little Fanning as recorded in record book 186, page 356, both in Levy County, Florida.

Type of Instrument:	Warranty Deed
Grantor:	E. T. Usher
Grantee:	Trustees
Beginning Date:	December 3, 1993

Ending Date:	Forever
Outstanding Rights:	The deed is subject to utility easements and easement for ingress and egress as recorded in record book 510, page 679; a water line easement recorded in record book 283, page 318; and utility easement recorded in record book 386, page 31, all in Levy County, Florida.

Addendum 2—Advisory Group Members and Report

Local Government Officials

The Honorable Howell E. Lancaster, III, Mayor
City of Fanning Springs

Agency Representatives

Mark Abrizenski, Manager
Fanning Springs State Park

Jamie Letendre, Environmental Specialist
Big Bend Sea Grasses Aquatic Preserve

Jade Roof, Manager
Andrews Wildlife Management Area

Jacob Sache, Chair
Levy Soil and Water Conservation District

Doug Longshore, Other Public Lands Forester
Florida Forest Service

Tourist Development Council

Carol McQueen, Director
Levy County Visitors Bureau

Environmental Representatives

Robert Garren, President
Florida Native Plant Society, Paynes Prairie Chapter

Helen Warren, President
Alachua Audubon Society

User Groups

Bill Richards, Executive Director
Paddle Florida, Inc.

Allyson Gill, President
Gainesville Cycling Club, Inc.

Citizen Support Organization

Mark Long, President
Friends of Manatee Springs Parks

Adjacent Landowner

Lynetta Usher Griner

The Advisory Group meeting for Fanning Springs State Park was held at the Fanning Springs Community Center on August 18, 2016. Michael Bubb represented Robert Garren and Scott Flamand represented Helen Warren. Jacob Sache and Carol McQueen were unable to attend. All other Advisory Group members were in attendance. Attending staff were Clif Maxwell, Rick Owen, Mark Abrizenski, and David Copps.

Mr. Copps began the meeting by explaining the purpose of the Advisory Group, reviewing the meeting agenda, and summarizing the comments from the public hearing that was held the previous evening. Mr. Copps then asked each member of the Advisory Group to express his or her comments on the draft plan.

Summary of Advisory Group Comments

Doug Longshore (Florida Forest Service) asked for clarification on the stated objective of "large scale" restoration of the successional hardwood forest zone. Mr. Owen described "large-scale" as the extensive removal of off-site hardwoods as opposed to "improvement" activities which are more incremental. He said that if the decision is made to move forward with restoration of the southernmost successional hardwood forest zone, it would be done as a large-scale project. He said that the smaller northernmost successional hardwood forest zone could be restored by smaller, less extensive improvement activities. Ms. Griner asked why the successional hardwood forest zone needs to be restored to upland mixed woodland and expressed a concern about future burning in this area. Mr. Owen explained that upland mixed woodland zone is an imperiled natural community that provides important habitat as a transition between upland pine and upland hardwood communities. Mr. Longshore recommended that the Division of Recreation and Parks (DRP) pursue funding for Fanning Springs dye tracing studies.

Lynetta Griner (adjacent landowner) recommended revising the plan to describe three private residences on the park's southwestern boundary rather than the stated two on page 75. She stated her opposition to moving the existing floating dock (at the Wayside Park) downriver as this would pose a limitation to public access. She stated that she would like to see a better partnership between the park and the City of Fanning Springs for community use of the event stage and recommended a that a discussion be included in the plan to address this issue. Ms.Griner said that the event stage was built with community support and engagement yet the perception is that it is difficult for the community to use the stage. Mr. Maxwell said that the park welcomes community use of the event stage. He said that fees can be waived and special events after hours is not a problem. He acknowledged that a park permit and proof of insurance is required but stated that this is an easy, straightforward process. Ms. Griner stated her opposition to the addition of a campground. She said that the park doesn't have the staffing to adequately manage such a facility. She also pointed out that a portion of the proposed campground is located within the upland mixed woodland restoration zones which poses a conflict between future land use and resource management.

Jamie Letendre (Big Bend Sea Grasses Aquatic Preserve) asked if the plan is flexible enough to incorporate future Surface Water and Management Program (SWIM) projects even if they are not known at the present time. Rick Owen answered yes, future restoration projects through the SWIM can be considered. Ms. Letendre asked if the impacts of sea level rise such as changes in the salinity regime and plant and animal species will be monitored at the park. Mr. Maxwell said that the 10-year plan update addresses sea level rise in a general way. She recommended more staffing for the park if the proposed campground and cabins are constructed.

Bill Richards (Paddle Florida, Inc.) stated his interest in the park as it is an important stop along the Suwannee River Wilderness Trail. He said that his organization has been promoting this paddling trail for the past 10 years but the trail is still very much underutilized. Mr. Richards said that Paddle Florida, Inc. is in favor of paddling related improvements. He recommended that kiosks with good wayfinding ("You are Here") signage and promotional information be installed at all main river stops including Fanning Springs State park. Mr. Richards acknowledged the difficult balancing act of protecting resources and providing public access. He said that an emphasis on nature-based recreation is key.

Trip Lancaster (Mayor, City of Fanning Springs) said that Fanning Springs has the potential to become an important regional ecotourism center and that the city is promoting itself as such in partnership with the Tourist Development Council. Mayor Lancaster said he looks forward to a continued partnership with the park to promote the area's recreational opportunities. He said that he is appreciative of the significant funding that the City has received from the Florida Department of Environmental Protection to upgrade the municipal sewage system. Mayor Lancaster stated his approval of the proposed addition of a campground and cabins. He recommended not moving the floating dock at the Wayside Park as it serves as the main gateway and access to Fanning Springs from the Suwannee River.

Scott Flamand (Alachua Audubon Society) pointed out that the proposed campground area overlaps the proposed upland mixed woodland restoration area (currently successional hardwood forest) and asked what impacts campground development would have on future restoration plans. Mr. Owen explained the conceptual nature of the land use and management zones and said that the management plan should be able to be balanced and adjusted to minimize conflicts.

Mark Long (Friends of Manatee River State Park) stated his opposition to the proposed campground. He said that this facility is too large for a small park.

Allyson Gill (Gainesville Cycling Club) said that she approves of the proposed campground but would like to see a lower impact tent camping facility that would appeal to bikers and hikers. She said that the people come from all over the country to experience the region's trail opportunities and that Fanning Springs can benefit economically by providing appropriate shopping and overnight opportunities for these trail users. Ms. Gill said that the current Florida Park Service camping

reservation system is not fair to bikers and hikers and recommended that a certain number of campsites be set aside and held (guaranteed) for bike-in and hike-in campers.

Michael Bubb (Florida Native Plant Society, Paynes Prairie Chapter) said that it is short-sighted to consider sea level rise only for coastal areas. He said that the general management measures for floodplain swamp should include a statement that the health of cypress trees will be monitored to identify possible effects of sea level rise. He recommended that the plan provide more specifics in terms of actions and steps that will be taken to determine whether or not to restore the successional hardwood forest. Mr. Owen said that the development and implementation of a restoration plan for the successional hardwood forest is one of the stated objectives in the management plan. Mr. Bubb stated his opposition to the campground if it contained RV sites. He said that he would agree with a tent camping area.

Jayde Roof (Florida Fish and Wildlife Conservation Commission) said that a more comprehensive animal list is needed for the park and encouraged staff to conduct more animal surveys to that end. He said the parks species list is very important and that it needs to be updated at every opportunity. Mr. Roof said that the lack of fuels in successional hardwood forests usually require an initial heavy-handed tree removal approach in order to get light on the ground to develop groundcover fuels for the future prescribed fire management. He stated his opposition to moving the floating dock from the Wayside Park and recommended building a new one if needed.

Summary of Public Comments

Brack Barker stated that the Suwannee River Wilderness Trail (SRWT) should have a series of primitive campsites along its route. He said that the primitive site at Fanning Springs might be able to accommodate both paddlers and bike-in campers especially if the proposed restroom is constructed at that site. He recommended that the Florida Park Service and other agencies work with the Florida Department of Transportation to install boating/paddling wayfinding information on all river bridges along the SRWT. Mr. Barker recommended that the proposed floating dock be located directly across and perpendicular to the Dixie County boating access area on the other side of the river.

Staff Recommendations

Comments received at the Advisory Group meeting resulted in the following modification to the draft management plan:

- The number of private residences on the park's southwestern boundary, described on page 75 of plan, will be changed to three.

- The proposed 30-site campground will be removed from the plan.
- Language describing the possible relocation of the floating dock at the Wayside Park will be removed from the plan.
- Language will be added to the plan stating that the event stage is available to surrounding communities to stage their own programs and events in partnership with the park.
- Language will be added in the general management measures section of the Floodplain Swamp description stating that cypress trees and other vegetation will be monitored to determine possible impacts of increased water salinity due to seal level rise.

With these modifications, DRP staff recommends approval of the proposed management plan for Fanning Springs State Park.

Notes on Composition of the Advisory Group

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

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

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

Addendum 3—References Cited

Albertin, A., J. Sickman, A. Pinowska, R.J. Stevenson, and M. Anderson 2007. Stable isotope compositions of macroalgae, sediment and nitrate in Florida Springs. Unpublished Task 1 final report to Florida Department of Environmental Protection, Tallahassee, Florida. 33pp.

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

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. 63pp.

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. 34pp.

Bland, M. and M. Chance 2002. An intensive cultural resource assessment of Fanning Springs State Recreation Area, Levy County Florida. Florida Master Site File Survey #5842. Division of Historic Resources, Florida Department of State, Tallahassee, Florida.

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.

Bush, P.W. and R.H. Johnston 1988. Groundwater hydraulics, regional flow, and groundwater development of the Floridan aquifer system in Florida and in parts of Georgia, South Carolina, and Alabama. United States Geological Survey Professional Paper 1403-C. 80pp.

Champion, K., and R. Starks 2001. The hydrology and water quality of springs in west-central Florida. Southwest Florida Water Management District. Brooksville, Florida. 164pp.

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.

Cichon, J. A, Wood, Baker, J. Arthur 2004. Application of geologic mapping and geographic information systems to delineate sensitive karst areas for land use decisions. American Geological Institute website accessed March 2011 at URL **http://www.agiweb.org/environment/publications/mapping/graphics/florida.pdf**

City of Fanning Springs. 2011. Future Land Use Plan Map. Fanning Springs, Florida.

City of Fanning Springs. 2011. Official Zoning Atlas. Fanning Springs, Florida.

Clark, M. W. and W. F. DeBusk 2008. Florida's total maximum daily load program after seven years of implementation. University of Florida Institute of Food and Agricultural Science Extension Office, SL270. Gainesville, Florida. 3pp.

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. 125pp.

Collins, L. D., S. Fernandez, J. P. Du Vernay, K.A. Driscoll and T.Doering 2012. Archaeological resource sensitivity modeling in Florida State Parks District 2: the Northeast Florida Region. Alliance for Integrated Spatial Technologies, University of South Florida, Tampa, Florida. 1063pp.

Copeland, R., J. Davis, and P. Hansard 1999. Nitrate source impacts on private well waters in northwest Lafayette County, Florida. Ambient Newsletter article Volume 3 (3). Florida ambient water quality monitoring network, Florida Department of Environmental Protection, Tallahassee, Florida. 16pp.

Copeland, R. 2003. Florida spring classification system and spring glossary. Florida Geological Survey, Special Publication No. 52 Tallahassee, Florida. 17pp. (**http://www.dep.state.fl.us/geology/publications/index.htm**)

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. 417pp.

Crane, J. J. 1986. An investigation of the geology, hydrogeology, and hydrochemistry of the Lower Suwannee River Basin. Report of Investigation No. 96, Bureau of Geology, Division of Resource Management, Florida Department of Natural Resources, Tallahassee. 205pp.

Davenport, S. 2001a. Archaeological Survey Fanning Springs State Recreation Area Site File #8LV537. Florida Master Site File Survey #10089. Division of Historic Resources, Florida Department of State, Tallahassee, Florida.

Davenport, S. 2001b. Post hole sifting results Fanning Springs State Park: Base station antennae fence – February 2001. Florida Master Site File Survey #10091. Division of Historic Resources, Florida Department of State, Tallahassee, Florida.

Davenport, S. 2005a. Fanning Springs State Park stage and ramp construction archaeological resource monitoring report. Florida Master Site File Survey #10790. Division of Historic Resources, Florida Department of State, Tallahassee, Florida.

Davenport, S. 2005b. Letter of transmission from Recreation and Parks to site file (8LV537). Florida Master Site File Survey #12088. Division of Historic Resources, Florida Department of State, Tallahassee, Florida.

Davenport, S. 2007. Archaeological monitoring of a solar light line trench in Fanning Springs State Park. 2007. Florida Master Site File Survey #14382. Division of Historic Resources, Florida Department of State, Tallahassee, Florida.

Davenport, S. 2011. Archaeological monitoring results/letter of transmission Fanning Springs State Park cabin gate post Levy County, Florida. Florida Master Site File Survey #18026. Division of Historic Resources, Florida Department of State, Tallahassee, Florida.

Davenport, S., L. Ditullio, and H. Myer 2010. Archaeological monitoring results/ letter of transmission Fanning Springs boardwalk waterline Levy County, Florida. Florida Master Site File Survey #17394. Division of Historic Resources, Florida Department of State, Tallahassee, Florida.

Dickinson, M. F. and L. B. Wayne 2003. Cultural resources survey and assessment Fanning Springs State Recreation Area proposed cabin sites Levy County, Florida. Florida Master Site File Survey #8989. Division of Historic Resources, Florida Department of State, Tallahassee, Florida.

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

Ditullio, L., and A. Moody 2009. Archaeological monitoring of new volleyball court in Fanning Springs State Park. Florida Master Site File Survey #16669. Division of Historic Resources, Florida Department of State, Tallahassee, Florida.

Ellis, G. D. and R. Martin 2002. Geoarchaeological study Fanning Springs Restoration Project. Florida Master Site File Survey #6401. Division of Historic Resources, Florida Department of State, Tallahassee, Florida.

Environmental Consulting and Technology Incorporated 2002. General report for supplemental assessment activities, Textile Town Facility (ID# 218842323), U.S. Highway 17, Fanning Springs, Florida. Report to Florida Department of Environmental Protection, Tallahassee, Florida.

Fernald E. A., and E. D. Purdum 1998. Water resources atlas of Florida. Florida State University, Institute of Science and Public Affairs, Tallahassee, Florida.

Florida Department of Environmental Protection (FDEP) 2001. Basin status report: Suwannee, including Aucilla, Coastal, Suwannee, and Waccasassa Basins in Florida. Division of Water Resource Management, Technical Report November 2001. Tallahassee, Florida. 193pp.

FDEP 2003. Water quality assessment report: Suwannee, including Aucilla, Coastal, Suwannee, and Waccasassa Basins in Florida. Division of Water Resource Management, Technical Report September 2003. Tallahassee, Florida. 362pp.

FDEP 2008. Monitoring report for eighteen state and federally managed spring systems in Florida year 2000-2007. Technical report completed in February 2008 to Florida Department Environmental Protection Environmental Assessment Section, Tallahassee, Florida. 156pp.

FDEP 2009. Elements of Florida's water monitoring and assessment program. Florida Department Environmental Protection Watershed Monitoring Program. Tallahassee, Florida. 110pp.

FDEP 2012a. Big Bend Seagrasses Aquatic Preserve (June 2012 draft). Florida Department Environmental Protection, Coastal and Aquatic Managed Areas, Tallahassee, Florida. 154pp.

FDEP 2012b. Florida Department Environmental Protection STORET database: Web-based water quality data. Accessed website 1 June 2012 at URL **http://epic229.dep.state.fl.us/WrmSpa**

FDEP 2012c. Total Maximum Daily Loads: Verified Impaired waterbodies in District 2 parks. Accessed website on 6 August 2012 at URL (**http://www.dep.state.fl.us/water/watersheds/assessment/vdllists.htm**)

FDEP 2012d. Mercury TMDL for the state of Florida (Revised Draft October 29, 2012). Accessed website on 31 December 2012 at URL (**http://www.dep.state.fl.us/water/tmdl/draft_tmdl.htm#mercury**).

FDEP 2012e. Florida Department Environmental Protection Map direct: Geographic Information Systems. Accessed October 2011 at URL **http://www.dep.state.fl.us/gis/**

FDEP 2012f. Temporal Variability (Trend) Network. Florida Department

Environmental Protection. At URL
http://www.dep.state.fl.us/water/monitoring/trend.htm

FDEP. 2016. Florida State Park System Economic Impact Assessment for Fiscal Year 2015/2016. Tallahassee, Florida.

Florida Exotic Pest Plant Council (FLEPPC) 2011. List of invasive plant species. Florida Exotic Pest Plant Council. Accessed website on 16 January 2013 at URL **http://www.fleppc.org/list/list.htm** or Wildland Weeds Vol. 14(3-4):11-14. Summer/Fall 2011.

Florida Natural Areas Inventory (FNAI). 2010. Guide to the natural communities of Florida: 2010 edition. Florida Natural Areas Inventory, Tallahassee, Florida. Accessed website on 16 January 2013 at URL
http://www.fnai.org/naturalcommunities.cfm

Gao, B., K. McKee, O. Gargiulo, W. Graham 2007. Statistical evaluation of hydrologic data in northeastern Florida and southern Georgia. Final report to Suwannee River Water Management District, Contract #25325. Brooksville Florida. 328pp.

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, GA. 5pp.

Geselbracht, L.L., K. Freedman, A.P. Birch, J. Brenner, and D.R. Gordon 2015. Modeled sea level rise impacts on coastal ecosystems at six major estuaries on Florida's Gulf Coast: Implications for Adaptation Planning. PLOS ONE. Volume 10, Number 7. 28pp.

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. United States Geological Survey. Professional paper 1656-C. 83pp.

Grubbs, J. W. 2011. Analysis of long-term trends in flow from a large spring complex in Florida. U.S. Geological Survey Karst Interest Group Proceedings, Fayetteville, Arkansas, April 26-29 2011. University of Arkansas. Scientific Investigations Report 2011-5031. 11pp.

Greenhalgh, T. 2008. Evidence of reduced flow from Fanning Spring. Power point presentation to Fanning Manatee Working Group on 7 August 2008. Florida Geological Survey, Florida Department of Environmental Protection, Tallahassee, Florida.

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), 123(3-4):457-467

Hallas, J. F., and W. Magley 2008. Nutrient and dissolved oxygen TMDL for the

Suwannee River, Santa Fe River, Manatee Springs (3422R), Fanning Springs (3422S), Branford Spring (3422J), Ruth Spring (3422L), Troy Spring (3422T), Royal Spring (3422U), and Falmouth Spring (3422Z): Bureau or Environmental Assessment and Restoration, Florida Department of Environmental Protection, Tallahassee, Florida. 117pp.

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. 114pp.

Harrington, D. and J. Wang 2011. Florida springs master list. Florida Department of Environmental Protection, Tallahassee, Florida. Web-based database, accessed December 2011 at URL **http://epic229.dep.state.fl.us/WrmSpa**

Hendryx, G. 2001. Management summary, Phase II archaeological testing at Fanning Springs State Recreation Area. Florida Master Site File Survey #7149. Division of Historic Resources, Florida Department of State, Tallahassee, Florida.

Hendryx, G. and S. Ferrell 2001. Shovel testing results along a proposed overflow line at Fanning Springs State Recreation Area. Florida Master Site File Survey #6543. Division of Historic Resources, Florida Department of State, Tallahassee, Florida.

Hendryx, G. and J. Nash 2003. Shovel testing at a proposed fence line and stage area at Fanning Springs State Park, Levy County, Florida. Florida Master Site File Survey #9295. Division of Historic Resources, Florida Department of State, Tallahassee, Florida.

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. 116pp.

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. 212pp.

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. 153pp.

Hydrogeologic Inc. 2011. Groundwater flow and saltwater transport model for the northern district water resources assessment project area. Report to Southwest Florida Water Management District, Brooksville, Florida. 15pp

Jenkins, D., R. McKinney, D. Parker, and M. Wetherington 2010. 2010 WARN

(Water Assessment Regional Network) monitoring atlas. Suwannee River Water Management District, Live Oak, Florida. 46pp.

Johnson, E., and J. Scafidi 1998. Draft resource management evaluation, Fanning Springs State Recreation Area. Florida Department of Environmental Protection, Division of Recreation and Parks, Tallahassee, Florida. 13pp.

Jones, G. W., S. B. Upchurch and K. M. Champion. 1996. Origin of Nitrate in Ground Water Discharging from Rainbow Springs, Marion County, Florida. Southwest Florida Water Management District, Brooksville. 155p.

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

Karst Environmental Services 2009. Manatee Springs dye trace: Cheifland stormwater runoff sinkhole, Levy County Florida, June-September 2009. Final report from Karst Environmental Services, High Springs, Florida.

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**.** United States Geological Survey Water Resources Investigations Report 99-4252, 54pp.

Katz, B.G. 2004. Sources of nitrate contamination and age of water in large karstic springs of Florida. Environmental Geology, Volume 46. 689-706pp.

Kelly, M. 2004. Florida river flow patterns and the Atlantic multidecadal oscillation. Draft Report. South West Florida Water Management District, Brooksville, Florida 80pp.

Kincaid, T. 1998. Rapid river water intrusion to the unconfined Floridan aquifer, Environmental & Engineering Geoscience. Volume 4 (3), College Station, Texas.

Kincaid, T. 2011. How much is too much? Toward a water budget approach to water management. Minimum Flows and Levels Workshop, Power point Presentation. Lecanto Florida 26 October 2011.

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. 7-13pp.

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. U.S. Geological Survey Professional Paper 1656A 124pp.

Livingston, E. H. 2003. Florida's Rotating Basin Approach: Towards Better Integration, Coordination, and Cooperation. Bureau of Watershed Management, Florida Department of Environmental Protection. 18pp.

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.

Maddox, G., J. Lloyd, T. Scott, S. Upchurch and R. Copeland. 1992. Florida's groundwater quality monitoring program: Background geochemistry. Special publication No. 34 Florida Geological Survey. 118pp.

Maddox, G, C. Cosper, P. Craig, and R. Copeland 1998. Groundwater quality and agricultural land use in the Lafayette County very intense study area (VISA). Report #AMR 1998-1. Florida Department of Environmental Protection, Division of Water Facilities Tallahassee, Florida. 4pp.

Marella, R. L., and M. P. Berndt 2005. Water withdrawals and trends from the Floridan aquifer system in the southeastern United States, 1950-2000. United States Geological Survey Circular 1278, 20pp.

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

Mirti, T. 2001. Springflow assessment of White Sulphur Springs. Proceedings of the 2001 Georgia Water Resources Conference held March 2001. K. J. Hatcher (ed.) Institute of Ecology University of Georgia, Athens Georgia 4pp.

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. 314pp. + Appendices.

Newman C. and M. Memory 2000. Limited archaeological inspection and testing of the proposed boardwalk corridor, Fanning Springs State Recreation Area, Levy County, Florida. Florida Master Site File Survey #10090. Division of Historic Resources, Florida Department of State, Tallahassee, Florida.

Neuendorf, K.K.E., J.P. Mehl, and J. A. Jackson 2005. Glossary of geology: Alexandria, American Geological Institute. 779p.

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. 15pp. Website accessed on 4 September 2012 **http://edis.ifas.ufl.edu/ss460**

Odum, H.T., J. Davis, W. Sloan, D. Caldwell, G. Brodhead 1953. Productivity of Florida's springs: Project NONR 580 (02). Semi-annual report to Biology Division, Office of Naval Research, Washington D.C. 34pp.

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

Pittman, Craig 2012. Florida's vanishing springs. Article for the Tampa Bay Times posted 25 November 2012. Website accessed on 31 December 2012 at URL (**http://www.tampabay.com/news/environment/water/floridas-vanishing-springs/1262988**).

Price, F.H. and L.S. Smith. 2012. Fanning Springs State Park research trip report part II, Fanning Springs LV00537. Florida Master Site File Survey #18756. Division of Historic Resources, Florida Department of State, Tallahassee, Florida.

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). 312pp.

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

Raabe, E.A, A.E. Streck, R.P. Stumpf 1977. Historic topographic sheet to satellite imagery: A methodology for evaluating coastal change in Florida's Big Bend tidal marsh. United States Geological Survey, Center for Coastal and Regional Marine Studies, St. Petersburg, Florida. Open File Report 02-211. 461pp.

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

Scott, T. M. 1991. The Geology of the Santa Fe River Basin, Central-northern Peninsular Florida. *in* Hydrogeology of the Western Santa Fe River Basin: Field Trip Guidebook No. 32. Southeastern Geological Society, Tallahassee, FL. 62 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 No. 66. Tallahassee, Florida. 377pp.

Schneider, J. W, S. B. Upchurch, J. Chen and C. Cain 2008. Simulation of groundwater flow in north Florida and south central Georgia: A three

dimensional model of groundwater flow in the surficial, intermediate, and Floridan aquifer systems. Suwannee River Water Management District. 99pp.

Sepulveda, N. 2002. Simulation of Ground-water Flow in the Intermediate and Floridan Aquifer Systems in Peninsular Florida. U.S. Geological Survey Water-Resources Investigations Report 02-4009. 138pp.

Slabaugh, J. D., A. O. Jones, W. E. Puckett, and J. N. Schuster 1996. Soil survey of Levy County, Florida. United States Department of Agriculture, Natural Resource Conservation Service. 297pp. + maps.

Silvanima, J., P. Hansard and D. Ouellette 2008. Florida Groundwater Quality: Monitoring network summary 1994-1997. Florida Department of Environmental Protection. Tallahassee, Florida.

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

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. 58pp.

Stokes, A.V., and M. Faught 1996. Underwater archaeological resource assessment survey of Fanning Springs in Levy County, Florida. Florida Department of Environmental Protection, Office of Greenways and Trails, Tallahassee, Florida. Florida Master Site File Survey #5366. Division of Historic Resources, Florida Department of State, Tallahassee, Florida.

Suwannee River Water Management District (SRWMD) 2005. Minimum flows and levels establishment for Lower Suwannee River & estuary, Little Fanning, and Fanning & Manatee Springs. Final Technical Report. Suwannee River Water Management District, Live Oak, Florida. October 2005. 298pp. +Appendices.

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

SRWMD 2012. Suwannee River Water Management District Water Data Portal. Web-based water quality data database, accessed June 2012 at URL **http://www.mysuwanneeriver.org/rivers.htm**

Still, D. 2010. Suwannee River Water Management District Director David Still letter to Governor Charlie Crist March 2010.

Swihart, T. 2011. Florida's water: A fragile resource in a vulnerable state. Resources for the Future Press, New York. 274pp.

United States Geological Survey (USGS) 2012. United States Geological Survey Surface-Water Data for Florida. Web-based Water Quality Data Database, accessed June 2012 at URL **http://waterdata.usgs.gov/fl/nwis/sw**

Upchurch, S. B., 1992, Quality of water in Florida's aquifer systems. *In* Maddox, G. L., J. M. Lloyd, T. M. Scott, S. B. Upchurch, and R. Copeland (eds.) Florida's groundwater quality monitoring program--Background hydrogeochemistry: Florida Geological Survey Special Publication 34, 12-63pp.

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, WV, Karst Waters Institute, Special Publication 7, 73-75pp.

Upchurch, S. B., and K. M. Champion 2002. Development Potential of the Ichetucknee Springshed. Florida Department of Environmental Protection. Florida. Tallahassee, Florida, Division of State Lands.

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. 21pp.

Upchurch, S. B., K. M. Champion, and J. C. Schneider 2005. Groundwater chemistry and origin of water discharging from Manatee and Fanning Springs, Levy and Gilchrist Counties, Florida. Suwannee River Water Management District, Live Oak, Florida. 41pp.

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, 36pp.

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. 34pp.

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. 43pp.

Verrill, R. 1976. Romantic and historic Levy County. Storter Print Company, Gainesville.

Weisman, B.R., and C.L. Newman 1995. Summary of cultural and historical resources at the Fanning Springs Greenway State Conservation and Recreation Area. CARL Archaeological Survey. Florida Master Site File Survey #4392. Division of Historic Resources, Florida Department of State,

Tallahassee, Florida.

Wetland Solutions Inc. (WSI) 2010. An ecosystem-level study of Florida's springs. FWC Project Agreement No. 08010: Appendix V: Summary of data for Rainbow Springs State Park, 55pp. 15 Jan. 2010 Wetland Solutions Inc., Gainesville, Florida.

Wheeler, R.J. 1997. Monitoring of ranger residence lots/drainfield placement, Fanning Springs State Recreation Area. CARL archaeological survey. Florida Master Site File Survey #4942. Division of Historic Resources, Florida Department of State, Tallahassee, Florida.

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. 172pp.

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

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. 2pp. abstract + map.

Williams, L.J., K.C. Ewel, R.P. Stumpf, F.E. Putz, and T.W. Workman 1999. Sea-level rise and coastal forest retreat on the west coast of Florida, USA. Ecology, Volume 80, Number 6, 2045-2063pp.

Addendum 4 -- Soil Descriptions

(3) Orsino fine sand, 0 to 8 percent slopes – This moderately well-drained, very deep, nearly level to gently rolling soil is on dunes and ridges. Individual areas are generally circular or elongated and range from 2 to nearly 750 acres in size.

Typically, the surface layer is gray fine sand about 4 inches thick. The subsurface layer is fine sand. It is very pale brown to a depth of about 8 inches and white to a depth of 13 inches. The subsoil is fine sand. It is brownish yellow to a depth of 48 inches, light yellowish brown to a depth of 58 inches, and brownish yellow to a depth of 70 inches. The underlying material to a depth of 80 inches or more is white fine sand.

On 95 percent of the acreage mapped as Orsino fine sand, 0 to 8 percent slopes, Orsino and similar soils make up about 88 to 100 percent of the mapped areas. Dissimilar soils make up less than about 12 percent. On 5 percent of the acreage, the dissimilar soils make up more than 12 percent of the mapped areas.

Included in mapping are soils that are similar to the Orsino soil but do not have a leached subsurface layer; have a surface layer that is made up dominantly of shell fragments; have limestone bedrock below a depth of 60 inches; have a dark, organically stained subsoil; have a seasonal high water table at a depth of 20 to 42 inches; or do not have a seasonal high water table within a depth of 60 inches.

Dissimilar soils that are included with the Orsino soil in mapping occur as small areas of Immokalee, Myakka, Otela, Placid, Pompano, Popash, Samsula, Smyrna, and Sparr soils and soils that have limestone bedrock within a depth of 60 inches. Placid, Popash, and Samsula soils are in depressions. Immokalee, Myakka, Pompano, Smyrna, and Sparr soils are in the slightly lower landscape positions. Otela soils are in the positions on the landscape similar to those of the Orsino soil. They have a loamy subsoil at a depth of 40 to 80 inches.

In most years, the seasonal high water table is at a depth of 48 to 60 inches in the Orsino soils for 1 to 6 months. Permeability is very rapid. Available water capacity is low.

(12) Otela-Candler complex, 1 to 5 percent slopes - This map unit consists of a moderately well drained Otela soil and an excessively drained Candler soil. These very deep, nearly level to gently sloping soils are on karst uplands. Individual areas are generally irregular in shape and range from 5 to more than 10,000 acres in size.

Typically, the surface layer of the Otela soil is dark grayish brown fine sand about 8 inches thick. The subsurface layer is fine sand. It is brown to a depth of about 21 inches, very pale brown to a depth of 32 inches, and white to a depth of 50 inches. Below this is a mixed subsurface layer and subsoil that is

brownish yellow fine sandy loam to a depth of about 61 inches, brownish yellow sandy clay loam to a depth of 68 inches, and light gray sandy clay loam to a depth of 80 inches or more.

Typically, the surface layer of the Candler soil is grayish brown fine sand about 7 inches thick. The subsurface layer is grayish brown fine sand to a depth of about 14 inches, pale brown fine sand to a depth of 30 inches, and very pale brown fine sand to a depth of 75 inches. Below this to a depth of 80 inches or more is a mixed subsurface layer and subsoil of white fine sand that has common thin, horizontal lenses of yellowish brown loamy fine sand.

Generally, the mapped areas average about 56 percent Otela and similar soils and 33 percent Candler and similar soils. The components of this map unit are so intermingled that it is not practical to map them separately at the scale used in mapping. However, the proportions of the Otela and Candler soils and the similar soils are fairly consistent in most mapped areas.

Included in mapping are soils that are similar to the Otela soil but have a dark surface layer that is more than 10 inches thick, have bedrock at a depth of 50 to 60 inches, have a seasonal high water table at a depth of 20 to 42 inches, or do not have a seasonal high water table within a depth of 72 inches. Also included are soils that are similar to the Candler soil but have more than 5 percent silt and clay between depths of 10and 40 inches, have a dark surface layer that is more than 8 inches thick, do not have sandy or loamy lenses within a depth of 80 inches, or have a seasonal high water table at a depth of 40 to 72 inches.

Dissimilar soils that are included with the Otela and Candler soils in mapping occur as small areas of Adamsville, Bonneau, Bushnell, Hague, Jonesville, Moriah, Placid, Popash, and Shadeville soils. Bonneau, Hague, Jonesville, and Shadeville soils are in positions on the landscape similar to those of the Otela and Candler soils. Adamsville, Bushnell, and Moriah soils are in the lower landscape positions. Placid and Popash soils are in depressions. Bonneau, Hague, Jonesville, and Shadeville soils have a loamy subsoil within a depth of 40 inches. Jonesville soils have a limestone bedrock within a depth of 40 inches.

In most years the seasonal high water table is perched at a depth of 48 to 72 inches in the Otela soil for 1 to 4 months. It is below a depth of 72 inches in the Candler soil throughout the year. Permeability is slow or moderately slow in the Otela soil and rapid in the Candler soil. Available water capacity is low in the Otela soil and very low in the Candler soil.

(15) Holopaw-Pineda complex, frequently flooded – These poorly drained, very deep, nearly level soils are on flood plains along rivers and creeks. They are frequently flooded. Individual areas are generally elongated and range from 3 to nearly 300 acres in size. Slopes range from 0 to 2 percent.

Typically, the surface layer of the Holopaw soil is very dark gray fine sand about 3 inches thick. The subsurface layer is light brownish gray fine sand to a depth of about 50 inches and pale brown fine sand to depth of 60 inches. The subsoil is gray sandy clay loam to a depth of 80 inches or more.

Typically, the surface layer of the Pineda soil is black fine sand about 4 inches thick. The upper part of the subsoil is brown fine sand to a depth of about 14 inches. The underlying material is light gray fine sand to a depth of about 28 inches and white fine sand to a depth of 35 inches. The lower part of the subsoil is light gray fine sandy loam to a depth of about 52 inches. The underlying material is gray fine sand to a depth of 80 inches or more.

Generally, the mapped areas average about 55 percent Holopaw and similar soils and 29 percent Pineda and similar soils. The components of this map unit are so intermingled that it is not practical to map them separately at the scale used in mapping. However, the proportions of the Holopaw and Pineda soils and of the similar soils are fairly consistent in most mapped areas.

On 80 percent of the acreage mapped as Holopaw-Pineda complex, frequently flooded, Holopaw, Pineda, and similar soils make up about 76 to 93 percent of the mapped areas. Dissimilar soils make up about 7 to 24 percent. On 20 percent of the acreage, the dissimilar soils make up more than 24 percent of the mapped areas.

Included in mapping are soils that are similar to the Holopaw soil but do not have a loamy subsoil within a depth of 80 inches, have a dark surface layer that is more than 7 inches thick, or have a subsurface layer that has colors in shades of yellowish brown. Also included are soils that are similar to the Pineda soil but do not have a sandy subsoil that is more than 4 inches thick, do not have sandy pockets and intrusions in the upper 2 to 10 inches of the loamy subsoil, or have a dark surface layer that is more than 10 inches thick. Also included are soils that are similar to the Pineda and Holopaw soils but have bedrock or layers of shell fragments below a depth of 60 to 80 inches or have a surface layer of muck, loamy sand, or sandy loam that is more than 3 inches thick.

Dissimilar soils that are included with the Holopaw and Pineda soils in mapping occur as small areas of Albany, Bradenton, Chobee, Gator, Ousley, and Terra Ceia soils and soils that have limestone bedrock within a depth of 60 inches. Bradenton and Chobee soils are in positions of the landscape similar to those of Holopaw and Pineda soils. Albany and Ousley soils are in the slightly higher landscape positions. Gator and Terra Ceia soils are in the lower landscape positions. Bradenton soils have a loamy subsoil with a depth of 20 inches. Chobee soils are loamy throughout.

In most years the seasonal high water table is within a depth of 12 inches in the Holopaw and Pineda soils for 2 to 6 months, but it can recede to a depth of about 60 inches during droughty periods. Areas of this map unit are flooded by adjacent rivers or creeks for periods of 1 to 4 months during most years.

Permeability is moderate in the Holopaw soil and slow or very slow in the Pineda soil. Available water capacity is low in both soils.

(31) Jonesville-Otela-Seaboard complex, 1 to 5 percent slopes - This map unit consists of a well drained, moderately deep Jonesville soil; a moderately well drained, very deep Otela soil; and a moderately well drained, shallow or very shallow Seaboard soil. These nearly level to gently sloping soils are on karst uplands. Individual areas are generally irregular in shape and range from 5 to more than 10,000 acres in size.

Typically, the surface layer of the Jonesville soil is gray fine sand about 5 inches thick. The subsurface layer is pale brown fine sand to a depth of about 14 inches and very pale brown fine sand to a depth of 27 inches. The subsoil is brownish yellow sandy clay loam to a depth of about 35 inches. Limestone bedrock is at a depth of about 35 inches.

Typically, the surface layer of the Otela soil is brown fine sand about 4 inches thick. The subsurface layer is light gray fine sand to a depth of about 22 inches, brownish yellow fine sand to a depth of 40 inches, very pale brown fine sand to a depth of 50 inches, and brownish yellow fine sand to a depth of 58 inches. The subsoil is yellowish brown sandy clay loam to a depth of 66 inches. Limestone bedrock is at a depth of about 66 inches.

Typically, the surface layer of the Seaboard soil is dark grayish brown fine sand about 8 inches thick. The underlying material is pale brown fine sand to a depth of about 17 inches. Limestone bedrock is at a depth of about 17 inches.

Generally, the mapped areas average about 48 percent of Jonesville and similar soils, 25 percent Otela and similar soils, and 16 percent Seaboard and similar soils. The components of this map unit are so intermingled that it is not practical to map them separately at the scale used in mapping. However, the proportions of the Jonesville, Otela, and Seaboard soils and of the similar soils are fairly consistent in most mapped areas.

On 95 percent of the acreage mapped as Jonesville-Otela-Seaboard complex, 1 to 5 percent slopes, Jonesville, Otela, Seaboard, and similar soils make up about 82 to 96 percent of the mapped areas. Dissimilar soils make up about 4 to 18 percent. On 5 percent of the acreage, the dissimilar soils make up more than 18 percent of the mapped areas.

Included in mapping are soils that are similar to the Jonesville soil but do not have a loamy subsoil or do not have bedrock within a depth of 40 inches. Also included are soils that are similar to the Otela soil but do not have a seasonal high water table within a depth of 72 inches, have a dark surface layer that is more than 10 inches thick, or have bedrock at a depth of 45 to 60 inches. Also included are soils that are similar to the Seaboard soil but have a loamy subsoil that overlies the bedrock, have a dark surface layer that overlies the bedrock or that is more than 10 inches thick, or have less than 5 percent silt

and clay in the subsurface layer.

Dissimilar soils that are included with the Jonesville, Otela, and Seaboard soils in mapping occur as small areas of Bushnell, Candler, Levyville, Lutterloh, Mabel, Moriah, and Tavares soils; small areas of strongly sloping soils; and areas of rock outcrop on the edges of sinkholes. Bushnell, Candler, Levyville, Lutterloh, Mabel, Moriah, and Tavares soils are in positions on the landscape similar to those of the Jonesville, Otela, and Seaboard soils. Bushnell and Mabel soils have a clayey subsoil within a depth of 20 inches. They are somewhat poorly drained. Candler and Tavares soils are sandy to a depth of 80 inches or more. Levyville soils have a loamy subsoil within a depth of 20 inches. Moriah and Lutterloh soils are somewhat poorly drained.

Throughout the year the seasonal high water table is below that bedrock in the Jonesville and Seaboard soils. It is perched at a depth of 42 to 72 inches for 1 to 4 months during most years in the Otela soil. Permeability is moderately slow or moderate in the Jonesville soil, moderate in the Otela soil, and rapid in the Seaboard soil. Available water capacity is very low in the Jonesville and Seaboard soils and low in the Otela soil.

Addendum 5—Plant and Animal List

Fanning Springs State Park

Plants

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

PTERIDOPHYTES

Bicolored spleenwort	*Asplenium heterochroum*	
Resurrection fern	*Pleopeltis polypodioides* var. *michauxiana*	
Tailed bracken	*Pteridium aquilinum* var. *pseudocaudatum*	
Water spangles	*Salvinia minima* *	
Widespread maiden fern	*Thelypteris kunthii*	
Marsh fern	*Thelypteris palustris Schott* var. *pubescens*	
Virginia chain fern	*Woodwardia virginica*	

GYMNOSPERMS

Red cedar	*Juniperus virginiana*	
Slash pine	*Pinus elliottii*	
Longleaf pine	*Pinus palustris*	
Loblolly pine	*Pinus taeda*	
Bald-cypress	*Taxodium distichum*	
Coontie	*Zamia pumila*	

ANGIOSPERMS

MONOCOTS

Pindo palm	*Butia capitata* *	
Sedge	*Carex* sp.	
Slender woodoats	*Chasmanthium laxum* var. *sessiliflorum*	
Spring coralroot	*Corallorhiza wisteriana*	
Witchgrass	*Dichanthelium* sp.	
Florida yam	*Dioscorea floridana*	
Burrhead	*Echinodorus* sp.	
Common water-hyacinth	*Eichhornia crassipes* *	
Green-fly orchid	*Epidendrum conopseum*	
Centipedegrass	*Eremochloa ophiuroides* *	
Michaux's cupgrass	*Eriochloa michauxii*	
Saltmarsh fingergrass	*Eustachys glauca*	
Spiked crested coralroot	*Hexalectris spicata*	UHF
Hydrilla	*Hydrilla verticillata* *	
Common yellow stargrass	*Hypoxis curtissii*	
Dotted duckweed	*Landoltia punctata*	
Little duckweed	*Lemna obscura*	
Easter lily	*Lilium longiflorum*	
Monkey-grass; Border-grass	*Liriope spicata* *	
Woodsgrass; Basketgrass	*Oplismenus hirtellus*	

* Non-native species

++ Extirpated, historically present

Fanning Springs State Park

Plants

Common Name	*Scientific Name*	Primary Habitat Codes (for imperiled species)
Beaked panicum	*Panicum anceps*	
Bahiagrass	*Paspalum notatum* var. *saurae* *	
Savannah panicum	*Phanopyrum gymnocarpon*	
Blackseed needlegrass	*Piptochaetium avenaceum*	
Water-lettuce	*Pistia stratiotes* *	
Pickerelweed	*Pontederia cordata*	
Starrush whitetop	*Rhynchospora colorata*	
Shortbristle horned beaksedge	*Rhynchospora corniculata*	
Dwarf palmetto	*Sabal minor*	
Cabbage palm	*Sabal palmetto*	
Springtape	*Sagittaria kurziana*	
Tall nutgrass	*Scleria triglomerata*	
Saw palmetto	*Serenoa repens*	
Narrowleaf blue-eyed grass	*Sisyrinchium angustifolium*	
Saw greenbrier	*Smilax bona-nox*	
Cat greenbrier	*Smilax glauca*	
Sarsaparilla vine	*Smilax pumila*	
Common duckweed	*Spirodela polyrhiza*	
St. Augustinegrass	*Stenotaphrum secundatum*	
Bartram's airplant	*Tillandsia bartramii*	
Spanish moss	*Tillandsia usneoides*	
Purplequeen	*Tradescantia pallida* *	
Easterm gamagrass	*Tripsacum dactyloides*	
Adam's needle	*Yucca filamentosa*	

DICOTS

Red maple	*Acer rubrum*	
Opposite spotflower	*Acmella oppositifolia* var. *repens*	
Red buckeye	*Aesculus pavia*	
Silktree; Mimosa	*Albizia julibrissin* *	
Alligatorweed	*Alternanthera philoxeroides* *	
Bastard false indigo	*Amorpha fruticosa*	
Peppervine	*Ampelopsis arborea*	
Eastern bluestar	*Amsonia tabernaemontana*	
Devil's walkingstick	*Aralia spinosa*	
Swamp milkweed	*Asclepias perennis*	
Slimleaf pawpaw	*Asimina angustifolia*	
Smallflower pawpaw	*Asimina parviflora*	
Groundsel tree; Sea-myrtle	*Baccharis halimifolia*	
Herb-of-grace	*Bacopa monnieri*	
Alabama supplejack	*Berchemia scandens*	
River birch	*Betula nigra*	
Beggarticks	*Bidens alba*	

Fanning Springs State Park

Plants

Common Name	*Scientific Name*	Primary Habitat Codes (for imperiled species)
Crossvine	*Bignonia capreolata*	
False nettle; Bog hemp	*Boehmeria cylindrica*	
American beautyberry	*Callicarpa americana*	
Trumpet creeper	*Campsis radicans*	
American hornbeam	*Carpinus caroliniana*	
Water hickory	*Carya aquatica*	
Pignut hickory	*Carya glabra*	
Mockernut hickory	*Carya tomentosa*	
Southern catalpa	*Catalpa bignonioides*	
Madagascar periwinkle	*Catharanthus roseus* *	
Sugarberry; Hackberry	*Celtis laevigata*	
Common buttonbush	*Cephalanthus occidentalis*	
Eastern redbud	*Cercis canadensis*	
Citrus	*Citrus* sp.	
Netleaf leather-flower	*Clematis reticulata*	
Tread-softly	*Cnidoscolus stimulosus*	
Blue mistflower	*Conoclinium coelestinum*	
Tickseed	*Coreopsis* sp.	
Roughleaf dogwood	*Cornus asperifolia*	
Flowering dogwood	*Cornus florida*	
Virginia buttonweed	*Diodia virginiana*	
Common persimmon	*Diospyros virginiana*	
Elephantsfoot	*Elephantopus* sp.	
Coralbean; Cherokee bean	*Erythrina herbacea*	
American strawberrybush	*Euonymus americanus*	
White ash	*Fraxinus americana*	
Carolina ash; pop ash	*Fraxinus caroliniana*	
Yellow jessamine	*Gelsemium sempervirens*	
Water locust	*Gleditsia aquatica*	
Angularfruit milkvine	*Gonolobus suberosus*	
Carolina silverbell	*Halesia carolina*	
Oakleaf hydrangea	*Hydrangea quercifolia*	
Marshpennywort	*Hydrocotyle* sp.	
Bedstraw St. John's-wort	*Hypericum galioides*	
St. Andrew's-cross	*Hypericum hypericoides*	
Carolina holly	*Ilex ambigua*	
Possumhaw	*Ilex decidua*	
American holly	*Ilex opaca*	
Yaupon	*Ilex vomitoria*	
Yellow anisetree; Star anise	*Illicium parviflorum*	DV
Morning-glory	*Ipomoea* sp.	
Crapemyrtle	*Lagerstroemia indica* *	
Japanese privet	*Ligustrum japonicum* *	
Sweetgum	*Liquidambar styraciflua*	
Japanese honeysuckle	*Lonicera japonica* *	

Fanning Springs State Park

Plants

Common Name	*Scientific Name*	Primary Habitat Codes (for imperiled species)
Creeping primrosewillow	*Ludwigia repens*	
Japanese climbing fern	*Lygodium japonicum* *	
Rusty staggerbush	*Lyonia ferruginea*	
Southern magnolia	*Magnolia grandiflora*	
Noyau vine	*Merremia dissecta* *	
Climbing hempvine	*Mikania scandens*	
Partridgeberry	*Mitchella repens*	
Lax hornpod	*Mitreola petiolata*	
Southern bayberry; Wax myrtle	*Myrica cerifera*	
Pricklypear	*Opuntia humifusa*	
Eastern hophornbeam	*Ostrya virginiana*	
Virginia creeper	*Parthenocissus quinquefolia*	
Red bay	*Persea borbonia*	
Red-leaf photinia	*Photinia glabra* *	
Turkey tangle fogfruit	*Phyla nodiflora*	
Slenderleaf false dragonhead	*Physostegia leptophylla*	
Cheesewood	*Pittosporum* sp.	
Mild waterpepper	*Polygonum hydropiperoides*	
Bog smartweed	*Polygonum setaceum*	
Marsh mermaidweed	*Proserpinaca palustris*	
Carolina laurelcherry	*Prunus caroliniana*	
Black cherry	*Prunus serotina*	
Flatwoods plum; Hog plum	*Prunus umbellata*	
Bastard white oak	*Quercus austrina*	
Spanish oak; Southern red oak	*Quercus falcata*	
Laurel oak; Diamond oak	*Quercus laurifolia*	
Overcup oak	*Quercus lyrata*	
Water oak	*Quercus nigra*	
Live oak	*Quercus virginiana*	
Indian azalea	*Rhododendron simsii* *	
Winged sumac	*Rhus copallinum*	
Tropical Mexican clover	*Richardia brasiliensis* *	
Sand blackberry	*Rubus cuneifolius*	
Southern dewberry	*Rubus trivialis*	
Carolina wild petunia	*Ruellia caroliniensis*	
Lyreleaf sage	*Salvia lyrata*	
Pineland pimpernel	*Samolus valerandi* ssp. *parviflorus*	
Canadian blacksnakeroot	*Sanicula canadensis*	
Rattlebox	*Sesbania punicea* *	
Gum bully	*Sideroxylon lanuginosum*	
Goldenrod	*Solidago* sp.	
Common sweetleaf	*Symplocos tinctoria*	
Carolina basswood	*Tilia americana* var. *caroliniana*	
Eastern poison ivy	*Toxicodendron radicans*	
Forked bluecurls	*Trichostema dichotomum*	

* Non-native species

++ Extirpated, historically present

Fanning Springs State Park

Plants

Common Name	*Scientific Name*	Primary Habitat Codes (for imperiled species)
American elm	*Ulmus americana*	
Sparkleberry	*Vaccinium arboreum*	
Highbush blueberry	*Vaccinium corymbosum*	
Deerberry	*Vaccinium stamineum*	
Giant ironweed	*Vernonia gigantea*	
Walter's viburnum	*Viburnum obovatum*	
Prostrate blue violet	*Viola walteri*	
Grape	*Vitis* sp.	
Pricklyash	*Zanthoxylum* sp.	

* Non-native species

++ Extirpated, historically present

Fanning Springs State Park

Animals

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

INVERTEBRATES

Dragonflies / Damselflies

Blue-fronted Dancer	*Argia apicalis*	SRST
Variable Dancer	*Argia fumipennis*	MTC
Powdered Dancer	*Argia moesta*	SRST
Green Grey Clubtail	*Arigomphus pallidus*	SRST
Ebony Jewelwing	*Caloptryx maculata*	SRST
Eastern Pondhawk	*Erythemis simplicicollis*	MTC
Little Blue Dragonlet	*Erythrodiplax minuscula*	MTC
Blackwater Clubtail	*Gomphus dilatatus*	SRST
Slaty Skimmer	*Libellula incesta*	SRST
Great Blue Skimmer	*Libellula vibrans*	MTC

Butterflies

Gulf Fritillary	*Agraulis vanillae*	MTC
Hackberry Emperor	*Asterocampa celtis*	MTC
Red-banded Hairstreak	*Calycopis cecrops*	MTC
Monarch	*Danaus plexippus*	MTC
Horace's Duskywing	*Erynnis horatius*	MTC
Carolina Satyr	*Hermeuptychia sosybius*	MTC
Common Buckeye	*Junonia coenia*	MTC
Dainty Sulphur	*Nathalis iole*	MTC
Cloudless Sulphur	*Phoebis sennae*	MTC
Pearl Crescent	*Phyciodes tharos*	MTC
Whirlabout	*Polites vibex*	MTC
Northern Cloudywing	*Thorybes pylades*	MTC
American Lady	*Vanessa virginiensis*	MTC

Crustaceans

Fontal Dwarf Crayfish	*Cambarellus schmitti*	SRST
Deceitful Crayfish	*Procambarus fallax*	SRST

Mollusks

Asian Clam	*Corbicula fluminea* *	SRST
Variable Spike	*Elliptio icterina*	SRST
Southern Fatmucket	*Lampsilis straminea claibornensis*	SRST
Mussel	*Quincuncina kleiniana*	SRST

FISH

Gulf Sturgeon	*Acipenser oxyrinchus desotoi*	BST, SRST
Alabama Shad	*Alosa alabamae*	BST, SRST
Yellow Bullhead	*Ameiurus natalis*	BST, SRST

* Non-native species

++ Extirpated, historically present

Fanning Springs State Park

Animals

Common Name	*Scientific Name*	Primary Habitat Codes (for all species)
Brown Bullhead	*Ameiurus nebulosus*	BST, SRST
Spotted Bullhead	*Ameiurus serracanthus*	BST, SRST
Bowfin	*Amia calva*	BST, SRST
American Eel	*Anguilla rostrata*	BST, SRST
Lake Chubsucker	*Erimyzon sucetta*	BST, SRST
Redfin Pickerel	*Esox americanus americanus*	BST, SRST
Chain Pickerel	*Esox niger*	BST, SRST
Eastern mosquitofish	*Gambusia holbrooki*	BST, SRST
Channel Catfish	*Ictalurus punctatus*	BST, SRST
Brook Silverside	*Labidesthes sicculus*	BST, SRST
Longnose Gar	*Lepisosteus ossens*	BST, SRST
Florida Gar	*Lepisosteus platyrhincus*	BST, SRST
Redbreast Sunfish	*Lepomis auritus*	BST, SRST
Warmouth	*Lepomis gulosus*	BST, SRST
Bluegill	*Lepomis macrochirus*	BST, SRST
Readear Sunfish	*Lepomis microlophus*	BST, SRST
Spotted Sunfish	*Lepomis punctatus*	BST, SRST
Bluefin Killifish	*Lucania goodei*	BST, SRST
Suwannee Bass	*Micropterus notius*	BST, SRST
Florida Largemouth Bass	*Micropterus salmoides floridanus*	BST, SRST
Striped Mullet	*Mugil cephalus*	BST, SRST
Golden Shiner	*Notemigonus crysoleucas*	BST, SRST
Shiner	*Notropis* sp.	BST, SRST
Redeye Chub	*Notropis harperi*	BST, SRST
Sailfin Molly	*Poecilia latipinna*	BST, SRST
Black Crappie	*Pomoxis nigromaculatus*	SRST
Atlantic Needlefish	*Strongylura marina*	BST, SRST
Hogchoker	*Trinectes maculatus*	BST, SRST

AMPHIBIANS

Frogs and Toads

Southern Toad	*Anaxyrus terrestris*	MTC
Greenhouse Frog	*Eleutherodactylus planirostris* *	MTC
Green Treefrog	*Hyla cinerea*	MTC
Cope's Gray Treefrog	*Hyla chrysoscelis*	AF, UHF, SHF
Squirrel Treefrog	*Hyla squirella*	UHF, SHF
American Bullfrog	*Lithobates catesbeiana*	FS
Bronze Frog	*Lithobates clamitans*	FS
Southern Leopard Frog	*Lithobates sphenocephala*	FS
Spring Peeper	*Pseudacris crucifer*	AF, UHF
Eastern Spadefoot Toad	*Scaphiopus holbrookii*	UMW, SHF

REPTILES

* Non-native species

++ Extirpated, historically present

Fanning Springs State Park

Animals

Common Name	*Scientific Name*	Primary Habitat Codes (for all species)
Crocodilians		
American Alligator	*Alligator mississippiensis*	BST, SRST
Turtles		
Florida Snapping Turtle	*Chelydra serpentina osceola*	FS
Gopher Tortoise	*Gopherus polyphemus*	UMW, SHF, DV
Striped Mud Turtle	*Kinosternon baurii*	BST, SRST
Eastern Mud Turtle	*Kinosternon subrubrum*	FS
Alligator Snapping Turtle	*Macrochelys temminckii*	BST
Florida Red-bellied Cooter	*Pseudemys nelsoni*	BST, SRST
Peninsula Cooter	*Pseudemys peninsularis*	BST, SRST
Suwannee Cooter	*Pseudemys suwanniensis*	BST, SRST
Loggerhead Musk Turtle	*Sternotherus minor*	SRST
Eastern Musk Turtle; Stinkpot	*Sternotherus odoratus*	SRST
Yellow-bellied Slider	*Trachemys scripta scripta*	BST
Lizards		
Green Anole	*Anolis carolinensis*	MTC
Brown Anole	*Anolis sagrei* *	DV
Southeastern Five-lined Skink	*Plestiodon inexpectatus*	UMW, SHF
Broad-headed Skink	*Plestiodon laticeps*	UMW, SHF
Eastern Fence Lizard	*Sceloporus undulatus*	UMW, SHF
Ground Skink	*Scincella lateralis*	UHF, SHF
Snakes		
Florida Cottonmouth	*Agkistrodon piscivorus conanti*	FS, AF
Southern Black Racer	*Coluber constrictor priapus*	UMW, SHF
East. Diamond-backed Rattlesnake	*Crotalus adamanteus*	UMW, SHF
Eastern Indigo Snake	*Drymarchon couperi*	UMW
Eastern Coachwhip	*Masticophis flagellum flagellum*	UMW, DV
Redbelly Water Snake	*Nerodia erythrogaster erythrogaster*	FS, SRST
Eastern Ratsnake	*Pantherophis alleghaniensis*	UHF, SHF

BIRDS

Waterfowl		
Wood Duck	*Aix sponsa*	BST, SRST
Partridges, Grouse, and Turkeys		
Wild Turkey	*Meleagris gallopavo*	UMW, SHF
Cormorants		
Double-crested Cormorant	*Phalocrocorax auritus*	BST, SRST

* Non-native species

++ Extirpated, historically present

Fanning Springs State Park
Animals

Common Name	*Scientific Name*	Primary Habitat Codes (for all species)
Anhingas		
Anhinga	*Anhinga anhinga*	BST, SRST
Herons and Egrets		
Great Blue Heron	*Ardea herodias*	BST, SRST
Great Egret	*Ardea alba*	BST, SRST
Snowy Egret	*Egretta thula*	SRST
Little Blue Heron	*Egretta caerulea*	BST, SRST
Tricolored Heron	*Egretta tricolor*	SRST
Cattle Egret	*Bubulcus ibis*	DV
Green Heron	*Butorides virescens*	BST, SRST
Ibises and Spoonbills		
White Ibis	*Eudocimus albus*	FS, SRST
New World Vultures		
Black Vulture	*Coragyps atratus*	MTC
Turkey Vulture	*Cathartes aura*	MTC
Hawks, Eagles, and Kites		
Osprey	*Pandion haliaetus*	BST, OF
Swallow-tailed Kite	*Elanoides forficatus*	BST, SRST, OF
Mississippi Kite	*Ictinia mississippiensis*	SHF, OF
Red-shouldered Hawk	*Buteo lineatus*	MTC, OF
Red-tailed Hawk	*Buteo jamaicensis*	UMW, OF
Sandpipers		
Spotted Sandpiper	*Actitis macularius*	BST, SRST
Gulls and Terns		
Royal Tern	*Thalasseus maximus*	BST, OF
Pigeons and Doves		
Mourning Dove	*Zenaida macroura*	MTC
Cuckoos		
Yellow-billed Cuckoo	*Coccyzus americanus*	UMW, SHF
Owls		
Eastern Screech-Owl	*Otus asio*	UMW, SHF
Barred Owl	*Strix varia*	AF, FS, UHF, SHF
Nightjars		
Common Nighthawk	*Chordeiles minor*	OF

Common Name	*Scientific Name*	Primary Habitat Codes (for all species)
Chuck-will's-widow	*Antrostomus carolinensis*	UMW, SHF
Eastern Whip-poor-will	*Antrostomus vociferus*	UMW, SHF
Swifts		
Chimney Swift	*Chaetura pelagica*	MTC, OF
Hummingbirds		
Ruby-throated Hummingbird	*Archilochus colubris*	MTC
Kingfishers		
Belted Kingfisher	*Ceryle alcyon*	BST, SRST
Woodpeckers		
Red-bellied Woodpecker	*Melanerpes carolinus*	MTC
Yellow-bellied Sapsucker	*Sphyrapicus varius*	UMW, UHF, SHF
Downy Woodpecker	*Picoides pubescens*	MTC
Northern Flicker	*Colaptes auratus*	DV
Pileated Woodpecker	*Dryocopus pileatus*	MTC
Tyrant Flycatchers		
Acadian Flycatcher	*Empidonax virescens*	AF, FS
Eastern Phoebe	*Sayornis phoebe*	MTC
Great Crested Flycatcher	*Myiarchus crinitus*	MTC
Vireos		
White-eyed Vireo	*Vireo griseus*	MTC
Blue-headed Vireo	*Vireo solitarius*	UMW, UHF, SHF
Red-eyed Vireo	*Vireo olivaceus*	UHF, SHF
Crows and Jays		
Blue Jay	*Cyanocitta cristata*	MTC
American Crow	*Corvus brachyrhynchos*	MTC
Fish Crow	*Corvus ossifragus*	MTC
Tits and Allies		
Carolina Chickadee	*Poecile carolinensis*	MTC
Tufted Titmouse	*Baeolophus bicolor*	MTC
Wrens		
Carolina Wren	*Thryothorus ludovicianus*	MTC
Kinglets		
Ruby-crowned Kinglet	*Regulus calendula*	MTC
Old World Warblers and Gnatcatchers		

Common Name	*Scientific Name*	Primary Habitat Codes (for all species)
Blue-gray Gnatcatcher	*Polioptila caerulea*	MTC
Thrushes		
Eastern Bluebird	*Sialia sialis*	DV
American Robin	*Turdus migratorius*	MTC
Mockingbirds and Thrashers		
Gray Catbird	*Dumetella carolinensis*	SHF, DV
Northern Mockingbird	*Mimus polyglottos*	DV
Brown Thrasher	*Toxostoma rufum*	SHF, DV
Starlings		
European Starling	*Sturnus vulgaris* *	DV
Waxwings		
Cedar Waxwing	*Bombycilla cedrorum*	MTC
New World Warblers		
Black-and-white Warbler	*Mniotilta varia*	MTC
Prothonotary Warbler	*Protonotaria citrea*	AF, FS
Hooded Warbler	*Setophaga citrina*	AF, UHF, SHF
Northern Parula	*Setophaga americana*	MTC
Magnolia Warbler	*Setophaga magnolia*	UMW, SHF, DV
Pine Warbler	*Setophaga pinus*	UMW, DV
Yellow-rumped Warbler	*Setophaga coronata*	MTC
Yellow-throated Warbler	*Setophaga dominica*	UMW, DV
Tanagers		
Summer Tanager	*Piranga rubra*	UMW, DV
Sparrows and Allies		
Chipping Sparrow	*Spizella passerina*	DV
Cardinals, Grosbeaks and Buntings		
Northern Cardinal	*Cardinalis cardinalis*	MTC
Blackbirds and Allies		
Red-winged Blackbird	*Agelaius phoeniceus*	MTC
Common Grackle	*Quiscalus quiscula*	MTC
Brown-headed Cowbird	*Molothrus ater* *	MTC
Finches and Allies		
American Goldfinch	*Carduelis tristis*	MTC

Common Name	*Scientific Name*	Primary Habitat Codes (for all species)
Old World Sparrows		
House Sparrow	*Passer domesticus* *	DV
MAMMALS		
Didelphids		
Virginia Opossum	*Didelphis virginiana*	MTC
Insectivores		
Eastern Mole	*Scalopus aquaticus*	UMW, DV
Edentates		
Nine-banded Armadillo	*Dasypus novemcinctus* *	MTC
Lagomorphs		
Eastern Cottontail	*Sylvilagus floridanus*	MTC
Rodents		
Beaver	*Castor canadensis*	BST
Southeastern Pocket Gopher	*Geomys pinetis*	DV
Southern Flying Squirrel	*Glaucomys volans*	MTC
Eastern Gray Squirrel	*Sciurus carolinensis*	MTC
Carnivores		
River Otter	*Lutra canadensis*	BST, SRST
Bobcat	*Lynx rufus*	MTC
Raccoon	*Procyon lotor*	MTC
Gray Fox	*Urocyon cinereoargenteus*	MTC
Artiodactyls		
White-tailed Deer	*Odocoileus virginianus*	MTC
Feral Hog	*Sus scrofa* *	MTC
Manatees		
West Indian Manatee	*Trichechus manatus*	BST, SRST

Addendum 6—Imperiled Species Ranking Definitions

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

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

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

FNAI GLOBAL RANK DEFINITIONS

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

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

G3 ..... Either very rare or local throughout its range (21-100 occurrences or less than 10,000 individuals) or found locally in a restricted range or vulnerable to extinction of other factors.

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

G5 ..... demonstrably secure globally

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

GX ..... believed to be extinct throughout range

GXC ..... extirpated from the wild but still known from captivity or cultivation

G#? ..... Tentative rank (e.g.,G2?)

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

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

G#Q..... rank of questionable species - ranked as species but questionable whether it is species or subspecies; numbers have same definition as above (e.g., G2Q)
G#T#Q..... same as above, but validity as subspecies or variety is questioned.
GU ..... due to lack of information, no rank or range can be assigned (e.g., GUT2).
G?..... Not yet ranked (temporary)
S1..... Critically imperiled in Florida because of extreme rarity (5 or fewer occurrences or less than 1000 individuals) or because of extreme vulnerability to extinction due to some natural or man-made factor.
S2..... Imperiled in Florida because of rarity (6 to 20 occurrences or less than 3000 individuals) or because of vulnerability to extinction due to some natural or man-made factor.
S3..... Either very rare or local throughout its range (21-100 occurrences or less than 10,000 individuals) or found locally in a restricted range or vulnerable to extinction of other factors.
S4..... apparently secure in Florida (may be rare in parts of range)
S5..... demonstrably secure in Florida
SH ..... of historical occurrence throughout its range, may be rediscovered (e.g., ivory-billed woodpecker)
SX..... believed to be extinct throughout range
SA..... accidental in Florida, i.e., not part of the established biota
SE..... an exotic species established in Florida may be native elsewhere in North America
SN ..... regularly occurring but widely and unreliably distributed; sites for conservation hard to determine
SU ..... due to lack of information, no rank or range can be assigned (e.g., SUT2).
S?..... Not yet ranked (temporary)
N ..... Not currently listed, nor currently being considered for listing, by state or federal agencies.

LEGAL STATUS

FEDERAL

(Listed by the U. S. Fish and Wildlife Service - USFWS)

LE ..... Listed as Endangered Species in the List of Endangered and Threatened Wildlife and Plants under the provisions of the Endangered Species Act. Defined as any species that is in danger of extinction throughout all or a significant portion of its range.
PE ..... Proposed for addition to the List of Endangered and Threatened Wildlife and Plants as Endangered Species.
LT ..... Listed as Threatened Species. Defined as any species that is likely to become an endangered species within the near future throughout all or a significant portion of its range.

PT ..... Proposed for listing as Threatened Species.
C ..... Candidate Species for addition to the list of Endangered and Threatened Wildlife and Plants. Defined as those species for which the USFWS currently has on file sufficient information on biological vulnerability and threats to support proposing to list the species as endangered or threatened.
E(S/A) ..... Endangered due to similarity of appearance.
T(S/A) ..... Threatened due to similarity of appearance.
EXPE, XE..... Experimental essential population. A species listed as experimental and essential.
EXPN, XN .... Experimental non-essential population. A species listed as experimental and non-essential. Experimental, nonessential populations of endangered species are treated as threatened species on public land, for consultation purposes.

STATE

ANIMALS .. (Listed by the Florida Fish and Wildlife Conservation Commission - FWC)

FE ..... Federally-designated Endangered

FT ..... Federally-designated Threatened

FXN..... Federally-designated Threatened Nonessential Experimental Population

FT(S/A) ..... Federally-designated Threatened species due to similarity of appearance

ST..... Listed as Threatened Species by the FWC. Defined as a species, subspecies, or isolated population, which is acutely vulnerable to environmental alteration, declining in number at a rapid rate, or whose range or habitat, is decreasing in area at a rapid rate and therefore is destined or very likely to become an endangered species within the near future.
SSC..... Listed as Species of Special Concern by the FWC. Defined as a population which warrants special protection, recognition or consideration because it has an inherent significant vulnerability to habitat modification, environmental alteration, human disturbance or substantial human exploitation that, in the near future, may result in its becoming a threatened species.

PLANTS .... (Listed by the Florida Department of Agriculture and Consumer Services - FDACS)

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

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

Addendum 7—Cultural Information

These procedures apply to state agencies, local governments, and non-profits that manage state-owned properties.

A. General Discussion

Historic resources are both archaeological sites and historic structures. Per Chapter 267, Florida Statutes, '*Historic property' or 'historic resource' means any prehistoric district, site, building, object, or other real or personal property of historical, architectural, or archaeological value, and folklife resources. These properties or resources may include, but are not limited to, monuments, memorials, Indian habitations, ceremonial sites, abandoned settlements, sunken or abandoned ships, engineering works, treasure trove, artifacts, or other objects with intrinsic historical or archaeological value, or any part thereof, relating to the history, government, and culture of the state."*

B. Agency Responsibilities

Per State Policy relative to historic properties, state agencies of the executive branch must allow the Division of Historical Resources (Division) the opportunity to comment on any undertakings, whether these undertakings directly involve the state agency, i.e., land management responsibilities, or the state agency has indirect jurisdiction, i.e. permitting authority, grants, etc. No state funds should be expended on the undertaking until the Division has the opportunity to review and comment on the project, permit, grant, etc.

State agencies shall preserve the historic resources which are owned or controlled by the agency.

Regarding proposed demolition or substantial alterations of historic properties, consultation with the Division must occur, and alternatives to demolition must be considered.

State agencies must consult with Division to establish a program to location, inventory and evaluate all historic properties under ownership or controlled by the agency.

C. Statutory Authority

Statutory Authority and more in depth information can be found at:
http://www.flheritage.com/preservation/compliance/guidelines.cfm

D. Management Implementation

Even though the Division sits on the Acquisition and Restoration Council and approves land management plans, these plans are conceptual. Specific information regarding individual projects must be submitted to the Division for review and recommendations.

Managers of state lands must coordinate any land clearing or ground disturbing activities with the Division to allow for review and comment on the proposed project. Recommendations may include, but are not limited to: approval of the project as submitted, cultural resource assessment survey by a qualified professional archaeologist, modifications to the proposed project to avoid or mitigate potential adverse effects.

Projects such as additions, exterior alteration, or related new construction regarding historic structures must also be submitted to the Division of Historical Resources for review and comment by the Division's architects. Projects involving structures fifty years of age or older, must be submitted to this agency for a significance determination. In rare cases, structures under fifty years of age may be deemed historically significant. These must be evaluated on a case by case basis.

Adverse impacts to significant sites, either archaeological sites or historic buildings, must be avoided. Furthermore, managers of state property should make preparations for locating and evaluating historic resources, both archaeological sites and historic structures.

E. Minimum Review Documentation Requirements

In order to have a proposed project reviewed by the Division, certain information must be submitted for comments and recommendations. The minimum review documentation requirements can be found at: http://www.flheritage.com/preservation/compliance/docs/minimum_review_documentation_requirements.pdf .

* * *

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

Deena S. Woodward
Division of Historical Resources
Bureau of Historic Preservation
Compliance and Review Section
R. A. Gray Building
500 South Bronough Street
Tallahassee, FL 32399-0250

Phone: (850) 245-6425

Toll Free: (800) 847-7278
Fax: (850) 245-6435

The criteria to be used for evaluating eligibility for listing in the National Register of Historic Places are as follows:

1) Districts, sites, buildings, structures, and objects may be considered to have significance in American history, architecture, archaeology, engineering, and/or culture if they possess integrity of location, design, setting, materials, workmanship, feeling, and association, and:

- **a)** are associated with events that have made a significant contribution to the broad patterns of our history; and/or
- **b)** are associated with the lives of persons significant in our past; and/or
- **c)** embody the distinctive characteristics of type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction; and/or
- **d)** have yielded, or may be likely to yield, information important in prehistory or history.

2) Ordinarily cemeteries, birthplaces, or graves of historical figures; properties owned by religious institutions or used for religious purposes; structures that have been moved from their original locations; reconstructed historic buildings; properties primarily commemorative in nature; and properties that have achieved significance within the past 50 years shall not be considered eligible for the *National Register*. However, such properties will qualify if they are integral parts of districts that do meet the criteria or if they fall within the following categories:

- **a)** a religious property deriving its primary significance from architectural or artistic distinction or historical importance; or
- **b)** a building or structure removed from its original location but which is significant primarily for architectural value, or which is the surviving structure most importantly associated with a historic person or event; or
- **c)** a birthplace or grave of an historical figure of outstanding importance if there is no appropriate site or building directly associated with his productive life; or
- **d)** a cemetery which derives its primary significance from graves of persons of transcendent importance, from age, distinctive design features, or association with historic events; or

e) a reconstructed building, when it is accurately executed in a suitable environment and presented in a dignified manner as part of a restoration master plan, and no other building or structure with the same association has survived; or a property primarily commemorative in intent, if design, age, tradition, or symbolic value has invested it with its own exceptional significance; or

f) a property achieving significance within the past 50 years, if it is of exceptional importance.

Restoration is defined as the act or process of accurately depicting the form, features, and character of a property as it appeared at a particular period of time by means of the removal of features from other periods in its history and reconstruction of missing features from the restoration period. The limited and sensitive upgrading of mechanical, electrical and plumbing systems and other code-required work to make properties functional is appropriate within a restoration project.

Rehabilitation is defined as the act or process of making possible a compatible use for a property through repair, alterations and additions while preserving those portions or features that convey its historical, cultural or architectural values.

Stabilization is defined as the act or process of applying measures designed to reestablish a weather resistant enclosure and the structural stability of an unsafe or deteriorated property while maintaining the essential form as it exists at present.

Preservation is defined as the act or process of applying measures necessary to sustain the existing form, integrity and materials of an historic property. Work, including preliminary measures to protect and stabilize the property, generally focuses upon the ongoing maintenance and repair of historic materials and features rather than extensive replacement and new construction. New exterior additions are not within the scope of this treatment; however, the limited and sensitive upgrading of mechanical, electrical and plumbing systems and other code-required work to make properties functional is appropriate within a preservation project.