

EDWARD BALL WAKULLA SPRINGS STATE PARK
UNIT MANAGEMENT PLAN

APPROVED PLAN

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

December 6, 2001



Department of Environmental Protection

Jeb Bush
Governor

Marjorie Stoneman Douglas Building
3900 Commonwealth Boulevard, MS 140
Tallahassee, Florida 32399-3000

David B. Struhs
Secretary

December 7, 2001

Ms. BryAnne White
Office of Park Planning
Division of Recreation & Parks
3900 Commonwealth Blvd., M.S. 525
Tallahassee, Florida 32399-3000

Re: Edward Ball Wakulla Springs State Park

Lease Number: # 3463

Dear Ms. White:

On December 6, 2001, the Acquisition and Restoration Council recommended approval of the Land Management Plan for Edward Ball Wakulla Springs State Park. Therefore, the Office of Environmental Services, acting as agent for the Board of Trustees of the Internal Improvement Trust Fund approves this plan. Pursuant to Section 253.034 and 259.032, Florida Statutes, and Chapter 18-2, Florida Administrative Code the plan's five-year update will be due in December 2006.

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.

Sincerely,

Delmas T. Barber

Delmas T. Barber, OMC Manager
Office of Environmental Services
Division of State Lands

"More Protection, Less Process"

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INTRODUCTION

Edward Ball Wakulla Springs State Park is located in Wakulla County about 17 miles south of Tallahassee, Florida. Access to the park is from Tallahassee via State Road 61 south, then east on State Road 267. The entry to the park is a short distance to the east of the intersection of these two highways (see Vicinity Map).

On September 17, 1986, the Board of Trustees of the Internal Improvement Trust Fund (Trustees) obtained title to a 2,860.53-acre property which constituted the initial area of Edward Ball Wakulla Springs State Park. The Trustees purchased the property under CARL Program. Since this initial purchase, the Trustees have acquired additional property using funds from the P-2000/CARL and Acquisitions and Inholdings program. The park currently contains 4,718.15 acres, consisting of 4,071.35 upland acres and 646.80 wetlands--submerged acres.

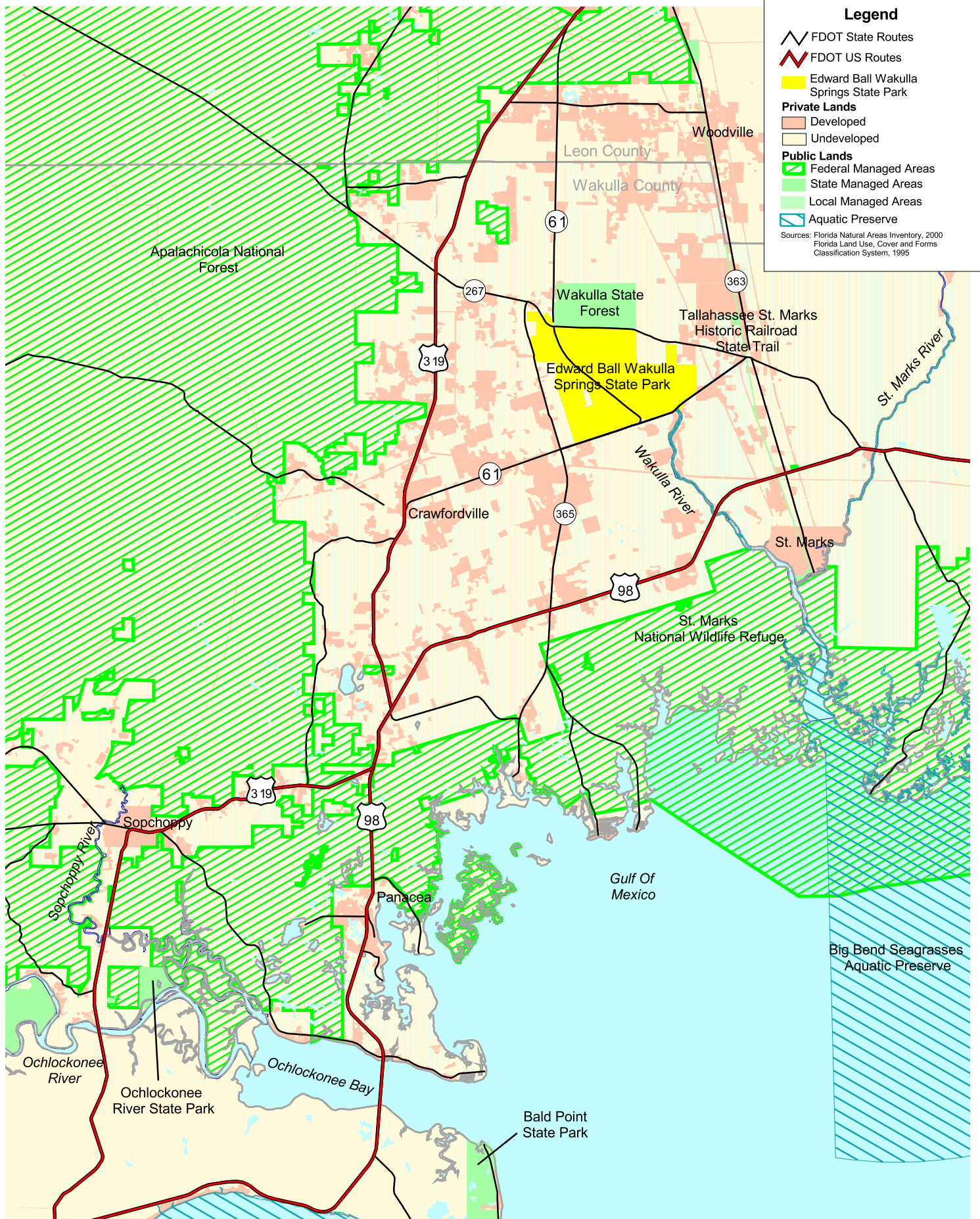
On October 20, 1986, the Trustees conveyed its management authority of Edward Ball Wakulla Springs State Park to the Department Of Environmental Protection, Division of Recreation and Parks (DRP) under Lease No. 3463. The lease is for a period of fifty (50) years, and it will expire on October 19, 2036.

According to the lease agreement between the Division and the Trustees, the Division will manage Edward Ball Wakulla Springs State Park for the conservation and protection of natural and cultural resources and for resource-based public outdoor recreation which is compatible with the conservation and protection of the property. Public outdoor recreation is the designated single use of the property (see Addendum 1). Recreational use has been limited to picnicking, swimming, boat tours, and multiple use nature trails. The park has been managed to continue the tradition of protecting the resources of the area. Restoration of disturbed natural resources is ongoing. Orderly scientific research into the natural and cultural resources of the park will continue to be encouraged.

PURPOSE AND SCOPE OF THE PLAN

This plan serves as the basic statement of policy and direction for the management of Wakulla Springs State Park as a unit of Florida's state park system. It identifies the objectives, criteria and standards that guide each aspect of park administration, and sets forth the specific measures that will be implemented to meet management objectives. The plan is intended to meet the requirements of Sections 253.034 and 259.032, Florida Statutes, Chapter 18-2, Florida Administrative Code, and intended to be consistent with the State Lands Management Plan. With approval, this management plan will supercede and replace the current approved plan of May 29, 1997. All development and resource alteration encompassed in this plan is subject to the granting of appropriate permits; easements, licenses, and other required legal instruments. Approval of the management plan does not constitute an exemption from complying with the appropriate local, state, or federal agencies. This plan is also intended to meet the requirements for beach and shore preservation, as defined in Chapter 161, Florida Statutes, and Chapters 62B-33, 62B-36 and 62R-49, Florida Administrative Code.

The plan consists of two interrelated components. Each component corresponds to a particular aspect of the administration of the park. The resource management component provides a detailed inventory and assessment of the natural and cultural resources of the park. Resource management problems and needs are identified, and specific management objectives are established for each resource type. This component provides guidance on the application of such measures as prescribed burning, exotic species removal, and restoration of natural conditions.



Edward Ball Wakulla Springs State Park
Vicinity Map



Florida Department of Environmental Protection
Division of Recreation and Parks
Office of Park Planning

The land use component is the recreational resource allocation plan for the unit. Based on considerations such as access, population, and adjacent land uses, an optimum allocation of the physical space of the park is made, locating use areas and proposing types of facilities and volume of use to be provided. In the development of this plan, the potential of the park to accommodate secondary management purposes (“multiple uses”) such as agriculture, water management and timber management was analyzed. These secondary purposes were considered within the context of the Division’s statutory responsibilities and an analysis of 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 Edward Ball Wakulla Springs State Park, it was determined that timber management could be accommodated in a manner that would be compatible and not interfere with the primary purpose of resource-based outdoor recreation and conservation. This compatible secondary management purpose is addressed in the Resource Management Component of the plan. Uses such as, water resource development projects, water supply projects, stormwater management projects, linear facilities and sustainable agriculture and forestry (other than those forest management activities specifically identified in this plan) are not consistent with this plan or the management purposes of the park and should be discouraged.

The potential for generating revenue to enhance management was also analyzed. Visitor fees and charges are the principal source of revenue generated by the park. It was determined that timber management for restoration purposes would be appropriate at this park as a means of supplementing revenue for land management since it is compatible with the park’s primary purpose of resource-based outdoor recreation and conservation.

The use of private land managers to facilitate restoration and management of this unit was also analyzed. Decisions regarding this type of management (such as outsourcing, contracting with the private sector, use of volunteers, etc.) will be made on a case-by-case basis as necessity dictates.

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 Trustees have also granted management authority of certain sovereign submerged lands to the Division 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 impact public recreational uses.

Many operating procedures are standard system wide and are set by policy. These procedures are outlined in the Division Operations Procedures Manual (OPM) and cover such areas as personnel management, uniforms and personal appearance, training, signs, communications, fiscal procedures, interpretation, concessions, camping regulations, resource management, law enforcement, protection, safety and maintenance.

In the management of Edward Ball Wakulla Springs State Park, a balance is sought between the goals of maintaining and enhancing natural conditions and providing various recreational opportunities. Natural resource management activities are aimed at management of natural systems. Development in the park is directed toward providing public access to and within the park, and to providing recreational facilities, in a reasonable balance, that are both convenient and safe. Program emphasis is on interpretation of the natural, aesthetic and educational attributes of the park.

Park Goals and Objectives

The following park goals and objectives express the Division's long-term intent in managing the state park. At the beginning of the process to update this management plan, the Division reviewed the goals and objectives of the previous plan to determine if they remain meaningful and practical and should be included in the updated plan. This process ensures that the goals and objectives for the park remain relevant over time.

Estimates are developed for the funding and staff resources needed to implement the management plan based on these goals, objectives and priority management activities. Funding priorities for all state park management and development activities are reviewed each year as part of the Division's legislative budget process. The Division prepares an annual legislative budget request based on the priorities established for the entire state park system. The Division also aggressively pursues a wide range of other funds and staffing resources, such as grants, volunteers, and partnerships with agencies, local governments and the private sector, for supplementing normal legislative appropriations to address unmet needs. The ability of the Division to implement the specific goals, objectives and priority actions identified in this plan will be determined by the availability of funding resources for these purposes.

Natural Resources

1. Identify, preserve and protect the natural resources of the park.
 - A. Control the growth of hydrilla in Wakulla Spring, the public swimming area and the boat dock area.
 - B. Identify and conduct controls on other exotic plants found within the park.
 - C. Expand the prescribed fire program of the park.
 - D. Continue exploration and mapping of the Wakulla Springs cave system.
 - E. Expand the exploration to include Cherokee Sink.
 - F. Maintain all park boundary fencing.
2. Identify disturbed natural resources, develop and implement restoration plans.
 - A. Expand the upland pine natural community restoration plan and project to include areas of the new park addition.
 - B. Develop a plan for restoration of Cherokee Sink. Such a plan will include measures

- for clean up of the site, access and use of the site, and erosion control.
- C. Implement the hydrilla control plan for Wakulla Springs State Park.
- D. Pursue funding to place clean fill on historic borrow pits.
- 3. Monitor the condition of the natural resources of the park.
 - A. Monitor water quality of Wakulla Spring, Wakulla River and Cherokee Sink.
 - B. Record and graph visibility of Wakulla Spring and daily rainfall.
 - C. Conduct an annual review of the prescribed fire program of the park.
 - D. Conduct photo plots of restoration sites.
- 4. Monitor populations of the wildlife of the park.
 - A. Conduct the Full River Survey of the Wakulla River twice a year.
 - B. Compile a written report from the data of the survey.
 - C. Conduct gopher tortoise burrow surveys after each prescribed fire.
 - D. Monitor and protect other designated species including the Limpkin and Apple snail.
 - E. Expand the flora and fauna list to include the new addition of the park.
 - F. Assist as needed with additional research projects of park wildlife.
- 5. Expand the use of modern technology to assist with the resource management.
 - A. Establish the use of GIS and GPS for natural resources at the park with the assistance of District staff.
 - B. Maintain and upgrade the prescribed fire equipment of the park.
 - C. Collaborate with other organizations to use expertise and equipment to gather additional information on park resources.

Cultural Resources

- 6. Identify, preserve and actively manage cultural resources.
 - A. Request a Phase I Archaeological Survey to be conducted on the new additions to the park. Emphasis placed on survey of suspected cemetery near Cherokee Sink.
 - B. Develop and adhere to appropriate cyclical management schedules for management of structures associated with the lodge complex.
 - C. Develop a phased plan for managing the identified cultural resources in the context of their surroundings.
 - D. Pursue funding to preserve cultural resources and make necessary repairs to historic structures.
 - E. Conduct ground disturbing activities in accordance with the Department of State, Division of Historical Resources (DHR) policy.
 - F. Maintain and protect archaeological sites and their associated artifactual assemblage from vandalism, erosion and other forms of encroachment.
 - G. Regularly patrol sites and assess the condition of recorded and unrecorded cultural resources. Monitor sites to be in poor condition and threatened by public use.

Recreational Goals

- 7. Continue to provide quality resource based outdoor recreational and interpretive programs and facilities at the state park.
 - A. Provide specialized interpretive programming through regularly scheduled ranger talks, guest speakers and workshops.
 - B. Provide passive interpretive opportunities through interpretive signs and kiosks at important resource locations.
 - C. Provide guided glass bottom boat and riverboat tours.
 - D. Maintain a designated swim area and diving platform in the Wakulla River spring basin.
 - E. Provide space for meetings, conferences and special events.
 - F. Maintain the lodge as a premier accommodation, dining, and conference facility.

8. Seek funding to expand recreational and interpretive opportunities through improvement of existing programs and facilities and the development of new use areas and facilities outlined in this management plan.
 - A. Improve interpretive opportunities through the development of an interpretive center, outdoor classroom space, upgraded exhibits, and additional interpretive signage and outreach programs.
 - B. Improve the aesthetics and architectural consistency of waterfront facilities.
 - C. Establish a shared use trail for hiking, off-road bicycling and horseback riding west of County Road 61.
 - D. Establish primitive camping west of County Road 61.
 - E. Enhance picnicking and swimming opportunities at Cherokee Sink.
 - F. Establish a system for the management of scuba diving at Cherokee Sink.
 - G. Construct a bridged crossing of Sally Ward Creek for the purposes of nature observation and linkage of existing trails.
 - H. Provide sheltered picnic areas.
 - I. Establish a universally accessible nature trail.
 - J. Improve signage on existing trails.
 - K. Convert the laundry building into a conference and meeting facility.

Park Administration/Operations

9. Provide efficient and effective management of park resources and facilities while maintaining a high level of visitor service.
 - A. Seek funding for three FTE positions to meet additional management demands presented by an expanded resource base and new recreational facilities. Positions needed include a Park Services Specialist and two Rangers.
 - B. Provide universally accessible public facilities.
 - C. Assure that appropriate training is provided to all staff in visitor services, park information, and emergency procedures.
 - D. Maintain high maintenance standards to provide clean and safe facilities to ensure visitor safety and enjoyment.
 - E. Partner with other land managers to share information and provide increased recreational opportunities on adjacent lands.
 - F. Periodically evaluate the tours to assure accurate information is being distributed.
 - G. Provide opportunities for park interpreters to increase their knowledge of the resources through additional training and study.
 - H. Recruit and maintain volunteer support to assist park staff with the maintenance of park facilities, protection of park resources and implementation of park programs.

Management Coordination

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

The Department of Agriculture and Consumer Services, Division of Forestry (DOF), assists DRP staff in the development of wildfire emergency plans and provides the authorization required for prescribed burning. The Florida Fish and Wildlife Conservation Commission (FFWCC), assists staff in the enforcement of state laws pertaining to wildlife, freshwater fish and other aquatic life existing within park boundaries. In addition, the FFWCC aids the Division with wildlife management programs, including the development and management of Watchable Wildlife programs. The Department of State, Division of Historical Resources (DHR) assists staff to assure protection of archaeological and historical sites. The Department of Environmental Protection (DEP), Office of Coastal and

Aquatic Managed Areas (CAMA) aids staff in aquatic preserves management programs. The DEP, Bureau of Beaches and Coastal Systems aids staff in planning and construction activities seaward of the Coastal Construction Line. In addition, the Bureau of Beaches and Coastal Systems aids the staff in the development of erosion control projects. Emphasis is placed on protection of existing resources as well as the promotion of compatible outdoor recreational uses.

Public Participation

During the development of this management plan, the Division sought public input by conducting the several meetings. An initial public workshop was held on May 2, 2000. The purpose of the meeting was to solicit comments from the public before the development of this proposed land management plan.

A second public workshop was held on May 2, 2001 (see Addendum 1). The purpose of this meeting was to present the proposed land management plan for Edward Ball Wakulla Springs State Park to the public

A DEP Advisory Group was held on May 3, 2001 (see Addendum 1). The purpose of this meeting was to review and discuss this proposed land management plan for Edward Ball Wakulla Springs State Park with the DEP Advisory Group.

Other Designations

Edward Ball Wakulla Springs State Park is not within and has not been designated as an Area Of Critical State Concern as defined in section 380.05, Florida Statutes. Currently it is not under study for such designation.

All waters within the unit have been designated as Outstanding Florida Waters, pursuant to Chapter 62-302 Florida Administrative Code. Surface waters in this unit are classified as Class III waters by DEP. Water quality monitoring is coordinated with the Northwest Florida Water Management District and the DEP, Division of Resource Assessment and Management.

The Wakulla Spring and Wakulla River are also designated as National Natural Landmarks pursuant to 16 U.S. Code 461. The National Park Service maintains the Registry of Natural Landmarks, which identifies and recognizes natural areas of ecological and geological significance. The Wakulla Springs Archaeological and Historic District, which is located within Edward Ball Wakulla Springs State Park, is now listed on the National Register of Historic Places. This register is also maintained by the National Park Service.

This unit is not within or adjacent to an aquatic preserve as designated under the Florida Aquatic Preserve Act of 1975 (section 258.35, Florida Statutes). However, the Wakulla River is classified as a tributary of the St. Marks River which is the western-most boundary of the Big Bend Sea Grasses Aquatic Preserve.

Several other significant land and water resources exist near the park. They include: Tallahassee-St. Marks Historic Railroad Trail State Park, San Marcos de Apalache Historic State Park, Natural Bridge Battlefield Historic State Park, Ochlockonee River State Park, Lake Talquin State Park, Leon Sinks Geological Area, Apalachicola National Forest, Wakulla State Forest, Lake Talquin State Forest, Tate's Hell State Forest, St. Marks National Wildlife Refuge, and the Aucilla Wildlife Management area.

RESOURCE MANAGEMENT COMPONENT

INTRODUCTION

The Division of Recreation and Parks has implemented resource management programs for preserving for all time the representative examples of natural and cultural resources of statewide significance under its administration. This component of the unit plan describes the natural and cultural resources of the park and identifies the methods that will be used to manage them. The stated management measures in this plan are consistent with the Department's overall mission in ecosystem management. Cited references are contained in Addendum 2.

The Division's philosophy of resource management is natural systems management. Primary emphasis is on restoring and maintaining, to the degree practicable, the natural processes that shape the structure, function and species composition of Florida's diverse natural communities as they occurred in the original domain. Single species management may be implemented when the recovery or persistence of a species is problematic provided it is compatible with natural systems management.

The management goal of cultural resources is to preserve sites and objects that represent all of Florida's cultural periods as well as significant historic events or persons. This goal may entail 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 is often affected by conditions and occurrences beyond park boundaries. Ecosystem management is implemented through a resource management evaluation program (to assess resource conditions, evaluate management activities, and refine management actions), review of local comprehensive plans, and review of permit applications for park/ecosystem impacts.

Edward Ball Wakulla Springs State Park's primary natural feature is the huge artesian spring that gives rise to the Wakulla River. Wakulla Spring is considered one of the world's largest and deepest freshwater springs. It has a recorded average flow (1907-1974) of 390 cubic feet per second or about 175,000 gallons per minute.. It also has the largest range of flow ever recorded for a Florida spring. The flow range is typically 125,000 gallons per minute to 600,000 gallons a minute, but this range can be exceeded. The spring's deep cavern has yielded the fossil remains of eight different extinct Pleistocene mammals. The cave system also contains several species of unusual fauna that live in these waters.

The Wakulla River is about nine miles in length with the first three miles occurring within the state park. Access to the river is limited within the park. For 50 years before state ownership, the property was owned by Edward Ball and operated as a wildlife sanctuary. Hunting, fishing and access to the woodlands were forbidden protecting the wildlife from most human disturbances. The protected river supports an extraordinary high density and variety of aquatic and terrestrial wildlife.

These wildlife populations attract thousands of worldwide visitors to the park each year. Extensive old-growth hardwood forest communities occur in several areas of the park. Some of these trees along the river are 400 - 600 years old.

In 2000, approximately 1,863 acres was acquired and added to the existing park boundary. The majority of the new addition is located to the west of the park and south of State Road 267. Concurrently, a parcel north of the park and State Road 267, and east of State Road

61, was acquired and is now being managed as a state forest by the Florida Division of Forestry.

There are numerous identified cultural resources on the park property. The park lodge complex and surrounding property are on the National Register of Historical Places. The Wakulla Spring and River are designated as a National Natural Landmark. Since 1935, the park has operated as a tourist attraction and wildlife sanctuary. Recreational use includes picnicking, swimming, guided boat tours, guided walks, and hiking, biking, and horseback riding on some of the park trails. Scientific research has been conducted on many different subjects at the park. Park staff continues to support additional approved scientific research that is beneficial.

RESOURCE DESCRIPTION AND ASSESSMENT

Natural Resources

Topography

The park occurs in the physiographic province known as the Gulf Coastal Lowlands, which covers most of the southern, half of the panhandle. The topography of the lowlands is generally flat with occasional ancient dune fields of higher elevation. The highest elevation at the park is about 30 feet above mean sea level. The majority, however, is below 20 feet, with the north side of the river being lower in elevation than the south side. The river, sloughs, floodplain swamps and floodplain forests make up about one-fourth of the acreage, and these areas are generally below 10 feet in elevation (see Topographic Map).

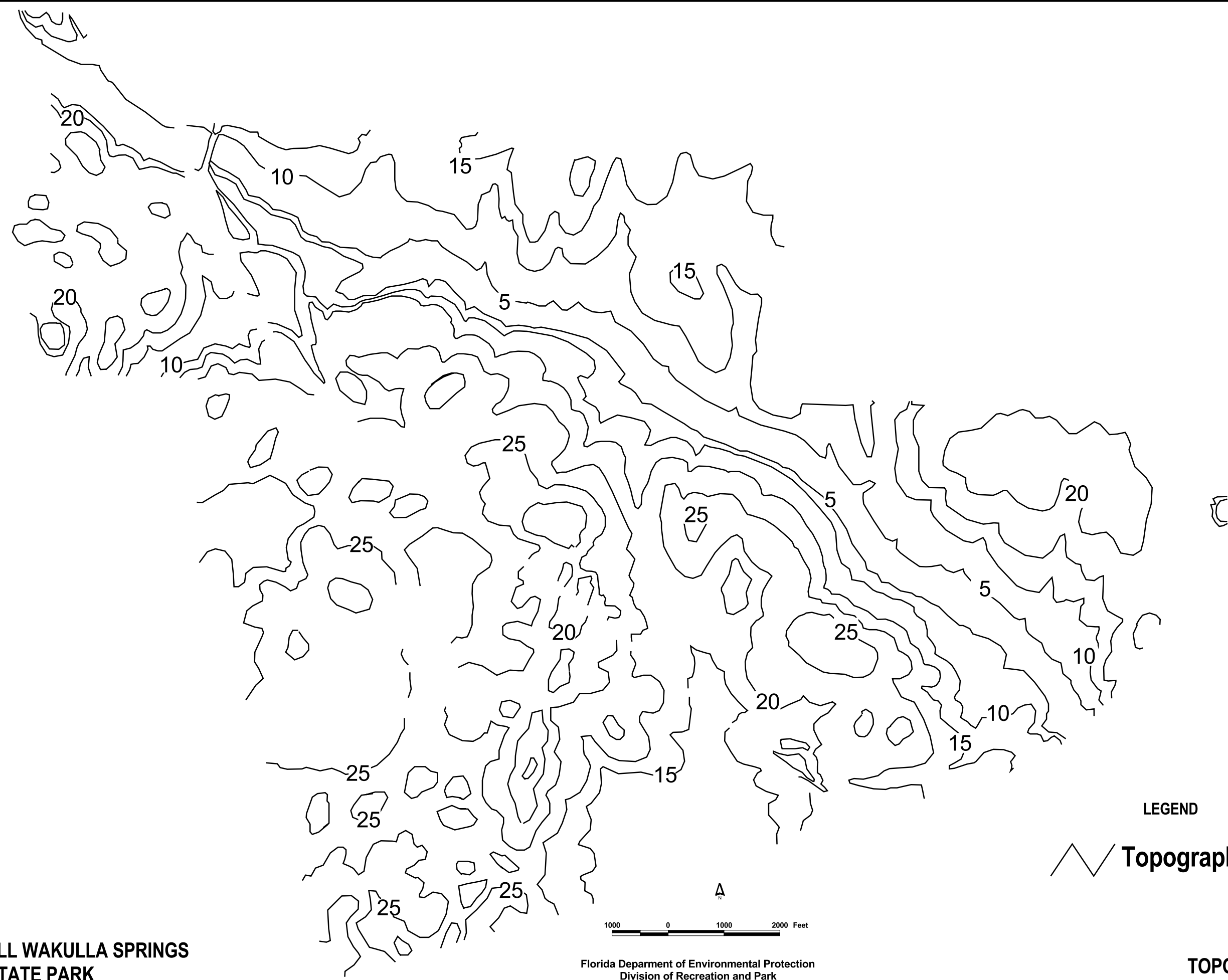
The major topographic feature is the main spring. Wakulla Spring is a first magnitude spring. With a mean flow of over 252 million gallons of water a day, the spring is classified, in average discharge, as one of the seven largest in Florida. Water clarity, when clear, enables the park visitor to see to a depth of about 125 feet where the bottom slopes under a limestone edge. The actual depth of the spring at the entrance to the cave system is about 185 feet.

Flood prone areas include most areas below 12 feet elevation within the park. Normal vertical Wakulla River water level fluctuations within the park do not exceed three feet annually with lowest levels reported in the winter and associated with periods of reduced rainfall.

From November 15, 1955 through June 1, 1957, approximately 100 documented cave penetrations by groups of two to six divers took place. During this time period at least 10 different divers, making 450 dives, were involved in horizontal cave penetrations ranging from 200 to 1,100 feet, which was the maximum extent of the mapping effort. Nonavailability of mixed gas and other technological limitations severely restricted bottom time on any given dive and limited maximum depths to about 250 feet.

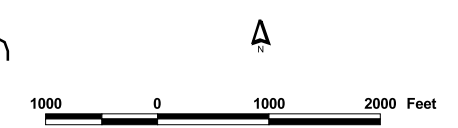
Since these initial dives, there has been three major dive efforts conducted at Wakulla Springs. The Wakulla Project occurred in October to December in 1987. The Wakulla II Project was done in November 1998 to February 1999. The Woodville Karst Plain Project (WKPP) has been conducting cave diving research since 1991. Currently it remains an ongoing project. These exploration, mapping and research work projects will be further described in this plan. Additional exploration and mapping is proposed for the Wakulla Springs cave system.

At least three Pleistocene mammal bone deposits are noted in the cave system, the largest of which lies within 200-600 feet of the cave entrance. Living animals are represented by troglobitic amphipods, isopods and crayfish, as well as American eels and catfish, which



LEGEND

 **Topographic lines**



**EDWARD BALL WAKULLA SPRINGS
STATE PARK**

Florida Department of Environmental Protection
Division of Recreation and Park
Office of Park Planning

TOPOGRAPHIC MAP

were seen as far back into the cave system as 3,000 feet at depths of 300 feet. A smaller spring, named Sally Ward Spring, is 0.7 miles northwest of the main spring. The Sally Ward Spring run joins the Wakulla River downstream from the Wakulla Spring. The Sally Ward Spring cave is a meandering six to 8-foot-wide tube, with a 30-foot vertical chimney at one point. It is suspected but not verified that the Sally Ward tunnel system connects with the Wakulla Spring system. McBride Slough and its associated floodplain swamp also join the Wakulla River within the park. In addition to these major topographic features, several smaller springs and solution depressions occur in the park. Some of these smaller springs have been explored by cave divers from the WKPP. The explorations of these smaller springs have concluded at this time that there are no entrances into their conduit systems that can be further explored by cave divers. Only Wakulla Spring and Sally Ward are currently being explored and mapped.

Cherokee Sink is a large sinkhole lake located in the western portion of the park. This sink was formed by the collapse of the limestone bedrock. The collapse was sufficiently deep to intercept the water table forming a water-filled sinkhole. The St. Marks Formation and overlying clays are exposed around the perimeter of Cherokee Sink. There are several other smaller sinkhole lakes and sinkholes located within the park.

Man-induced topographic alterations to the park include signs of past forestry activities, patrol or access road construction, dredging and blasting river channels, and excavation of borrow pit/dump sites. Old fireflow lines and remnant roads associated with agricultural logging and turpentine operations exist throughout the former longleaf pinelands. The upland areas of the newly acquired addition were clear-cut of most merchantable timber in 1987 and 1988. Boundary road construction along State Road 267 and State Road 61, as well as road development paralleling the Wakulla River along the southern edge of the floodplain forest, occurred after 1952 and before 1972 based upon DOT aerial photos. Construction of these roads resulted in formation of low swales adjacent to the roads, irregular piling of low mounds of unused fill along the road shoulders at the forest edge, and in some places borrows of fill to level low areas while at the same time reducing elevations in some uplands area. River channel modifications to the river tour route and all of Sally Ward Slough also occurred before 1972, probably in the late 1960s. Spoil banks deposited by dredging operations have since been colonized by native pioneer vegetation normally growing on slightly higher sites than would be expected at the river's edge.

Two extensive borrow pits existing before 1937 aerial photos occur in the southwestern portion of the park. They received limited use as dumpsites, primarily of lodge construction materials and kitchen refuse. These pits, up to 30.0 feet in length, 4-7 feet deep and of variable width are designated 8Wa3S1 and 8Wa371 in the 1988 Archaeological Survey of Wakulla Springs conducted by the Department of the State (Byrne, 1988). Additional smaller excavated trash pits still exist near the shop complex. Other trash pits near the shop have been filled in. At least one borrow pit near the old shop was created in 1969 when sand was removed to replace that lost from the beach during a high water episode.

Geology

Beneath a thin veneer of undifferentiated quartz sands and clays of recent marine origin lie three limestone layers. The uppermost limestone layer lying within 25 feet of the surface and sometimes protruding through the ground at various locations in the park is the St. Marks Formation. This limestone is typically a pale orange to light gray to white and moderately hard for chalky limestone. It contains many fossils including numerous mollusk species molds and such Foraminifera as *Scrites* sp. and *Archaias* sp. The St. Marks Formation formed about 25 million years ago during the Lower Miocene Age.

At depths below 90 feet in the Wakulla Spring Cave system, St. Marks Formation limestone is replaced by the 30-35 million-year-old Lower Oligocene age Suwannee limestone. Below a depth of 400 feet the 36-39 million-year-old Ocala Group limestone occurs.

The St. Marks formation constitutes the upper unit of the Floridan aquifer and it is in this unit at depths of 25-150 feet that most Wakulla County water is drawn. The Suwannee and Ocala Group Formations comprise the lower units of the Floridan Aquifer. The Wakulla cave system explored to date runs through the Suwannee Formation.

The park includes surface features of two recent epoch seabottom terraces associated with the advances of the sea during the earlier Pleistocene epoch. These Pamlico and Silver Bluff Terraces are found around the state's shoreline at elevations ranging from 8-25 feet and 1-10 feet respectively. The Pamlico Terrace was formed during the mid-Wisconsin interglacial stage; and it represents the largest area of the park. The more recent Silver Bluff Terrace formed perhaps 4,500 years ago when sea levels were 8-10 feet higher than they are now. At that time, a marine intrusion occurred up the valley of the Wakulla River, apparently as far as the Southern-most lowlands of the park.

Within the Gulf Coastal Lowlands physiographic province is the region known as the Woodville Karst Plain. This area is characterized as flat to gently rolling surface of porous sands overlying Oligocene and Miocene age limestones. Surface elevation ranges from zero to 30 feet above mean sea level and slopes southward at an average of four feet per mile. Limestone is present within 25 feet of the surface in most of the area. The top of this limestone is highly karstic, having undergone extensive dissolution by groundwater percolating through the porous overlying sand. Karst topography is a term applied to land where near-surface carbonate rock has been dissolved by groundwater forming features such as sinkholes, caves, springs and depression lakes.

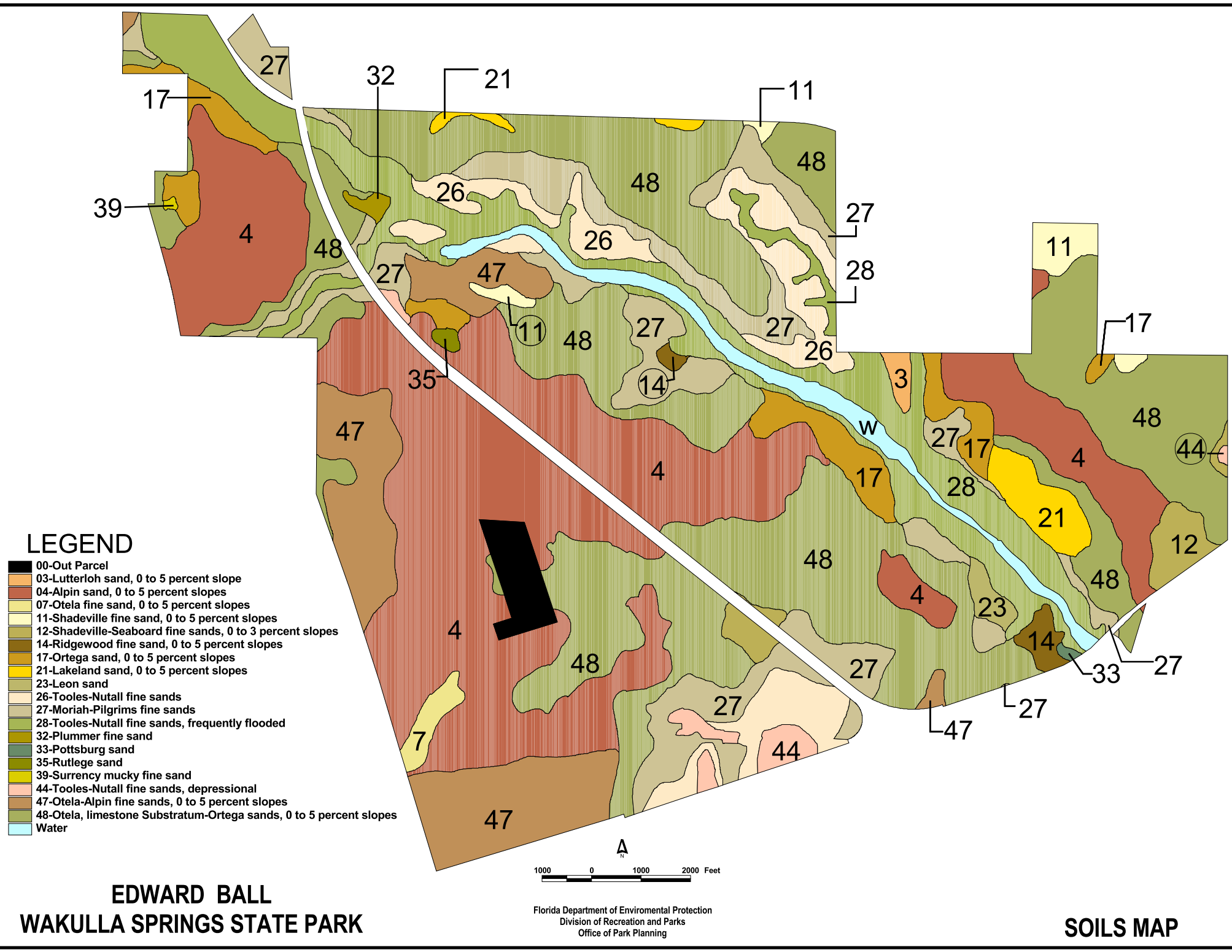
Soils

Most of the soil types at Edward Ball Wakulla Springs State Park have developed from the sandy marine terraces deposited since the mid-Pleistocene epoch (see Soils Map). These quartz sands are relatively clay free, clean, unconsolidated and acidic. Other soils in the park are alluvial sediments deposited over time in the floodplains of water courses, sandy peats deposited in the permanent and temporary pond basins, and loose sands washed into various depressions. The thinness of the sands over the limestone substrate and the character of the sands themselves contributed to the formation of the upland pine community that dominated the area prior to human disturbance. There are 17 soil types at Wakulla Springs and a complete soil type description for each one is contained in Addendum 3.

Minerals

While several minerals occur in the park and are described below, there are no known deposits of commercial value. At the park, the exposed subsurface St. Marks Formation limestones are composed principally of the mineral calcite, a crystalline form of calcium carbonate, CaCO_3 . They contain a high percentage of impurities that contribute to their soft chalky texture. Large calcite crystals have not formed here because the subsurface limestone cavities remain water-filled. Dolomite typically is found associated with limestone in Wakulla County, but is not verified at the park.

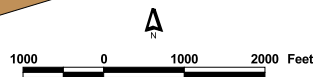
Clay and quartz sands are also found at Wakulla Springs. Clays were originally deposited as mud in shallow marine seas or estuaries. Quartz sand, or crystalline silica, is the most abundant surface material in Florida. The sand was derived from the erosion of the ancient



LEGEND

- 00-Out Parcel
- 03-Lutterloh sand, 0 to 5 percent slope
- 04-Alpin sand, 0 to 5 percent slopes
- 07-Otela fine sand, 0 to 5 percent slopes
- 11-Shadeville fine sand, 0 to 5 percent slopes
- 12-Shadeville-Seaboard fine sands, 0 to 3 percent slopes
- 14-Ridgewood fine sand, 0 to 5 percent slopes
- 17-Ortega sand, 0 to 5 percent slopes
- 21-Lakeland sand, 0 to 5 percent slopes
- 23-Leon sand
- 26-Tooles-Nutall fine sands
- 27-Moriah-Pilgrims fine sands
- 28-Tooles-Nutall fine sands, frequently flooded
- 32-Plummer fine sand
- 33-Pottsburg sand
- 35-Rutledge sand
- 39-Surrency mucky fine sand
- 44-Tooles-Nutall fine sands, depressional
- 47-Otela-Alpin fine sands, 0 to 5 percent slopes
- 48-Otela, limestone Substratum-Ortega sands, 0 to 5 percent slopes
- Water

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SOILS MAP

Appalachian Mountains and the fragmentation and transport southward of their harder quartz components. Chert, a low-grade flint, occurs in pockets within Tampa Stage limestone. It was formed when groundwater replaced calcium carbonate with silica. Although no prehistoric quarry sites and few diagnostic artifacts are known within the park, native Americans almost certainly obtained chert for their stone tools from the park's exposed limestone. Bryne (1988) reported ten different occurrences of primary and secondary decortication chert flakes as well as non-decortication chert flakes, all probably from the Archaic Period. In addition, chert scrapers, hammerstones, and Newnan, Wacissa, Putnam Bradford, Hernando, and Lafayette projectile points were found.

Abundant fossils have been found in the park. Shell fossils, formed when calcite replaced the shells' calcium carbonate, are occasionally evident in the exposed limestone. Of more interest, however, are fossil animal remains that were recovered as early as 1850. In 1930, another almost complete mastodon skeleton was recovered and is now on display at the Museum of Florida History in Tallahassee. Other extinct Pleistocene species found in the spring include giant ground sloth, giant armadillo, tapir, mammoth, horse, bison and camel. The recent deep dives have reported that an abundance of fossilized bones remain in the cavern. In addition to the extensive bone beds first mentioned by Olsen (1958), a second bone deposit was discovered some 1,200 ft. into tunnel "B" at a depth of 285 ft. during the 1987 dive project.

Hydrology

The principal hydrological feature in the park is the Wakulla River, supplied by one major and several minor springs. The river is a clear, calcareous spring run. Water temperature averages 69 degrees, and the pH is 7.3 (slightly alkaline). The water is hard averaging 153 mg/l-dissolved solids. The sediment load from land runoff into the river is minimal because of the low topography and the well-vegetated riverbanks. In the first two miles of river, where the river bottom does not consist of exposed limestone, dense growths of rooted aquatic plants stabilize sandy and silty soils.

The Floridan Aquifer is the primary source of the spring water at the park. Like most large springs in Florida, the Wakulla Springs complex is of the calcium-bicarbonate type. The source of water contributing to the flow emerging at Wakulla Springs is uncertain, but potentiometric surfaces suggest the recharge area is immediately south to southwest of Tallahassee. However, water flow in the cave system is towards the Grand Junction and then ultimately northwestward towards the spring vent. This flow is generally in opposition to the local potentiometric gradient.

When heavy rains leach the leaf litter's organic acids into the recharge areas, tannin-colored water flows underground and out of the springs. This condition often causes Wakulla Springs to darken from a few weeks to up to eleven months at a time. Before May of 1957, the spring was reportedly clear mostly year round (Wally Jenkins, personal communication). The cause of seasonally reduced clarity at Wakulla Springs for the past 35 years is presently unknown. A link between rainfall and water clarity does appear to exist. Extreme clarity of the spring only occurs when local rainfall is minimal. This varies seasonally from year to year but increased clarity of Wakulla Spring is most common in the spring to early summer months of April through July.

While Wakulla Spring, like other major springs, is relatively stable in its discharge, it nevertheless has the distinction of having the greatest recorded range of flow of the major Florida springs. That range, measured between 1907 and 1974, extended from a low of 25 cubic feet per second in June 1931, to a high of 1,910 cubic feet per second in April 1973. This peak flow, which is equivalent to over 14,000 gallons per second, still stands as the

state record. The average flow calculated from the 67 years of record is 390 cubic feet (almost 3,000 gallons) per second.

In May of 1997, the Northwest Water Management District with the assistance of the Florida State University Academic Dive Program installed an automatic current meter at the mouth of the spring. The S-4 meter was installed at a depth of 190 feet at the entrance of the main tunnel.

Annual average rainfall at the park is about 56 inches, which percolates quickly into the flat sandy soils. While the area of Wakulla River's drainage basin is 16.2 square miles at the spring, little surface runoff enters the Wakulla River directly. However, the fact that the spring darkens much more frequently than before, suggests that locally recharged water emerging from the spring may be affected by development to the north.

Cherokee Sink is a large sinkhole located on the newly acquired addition. The collapse of this sinkhole when formed was sufficiently deep to intercept the water table allowing it to become water filled. Dive exploration has shown the sink to be about 60 feet deep with silt, sandy bottom. This silt and sand has eroded into the sinkhole at a great rate over the past years. It is believed that Cherokee Sink had a much greater depth than 60 feet before the erosion.

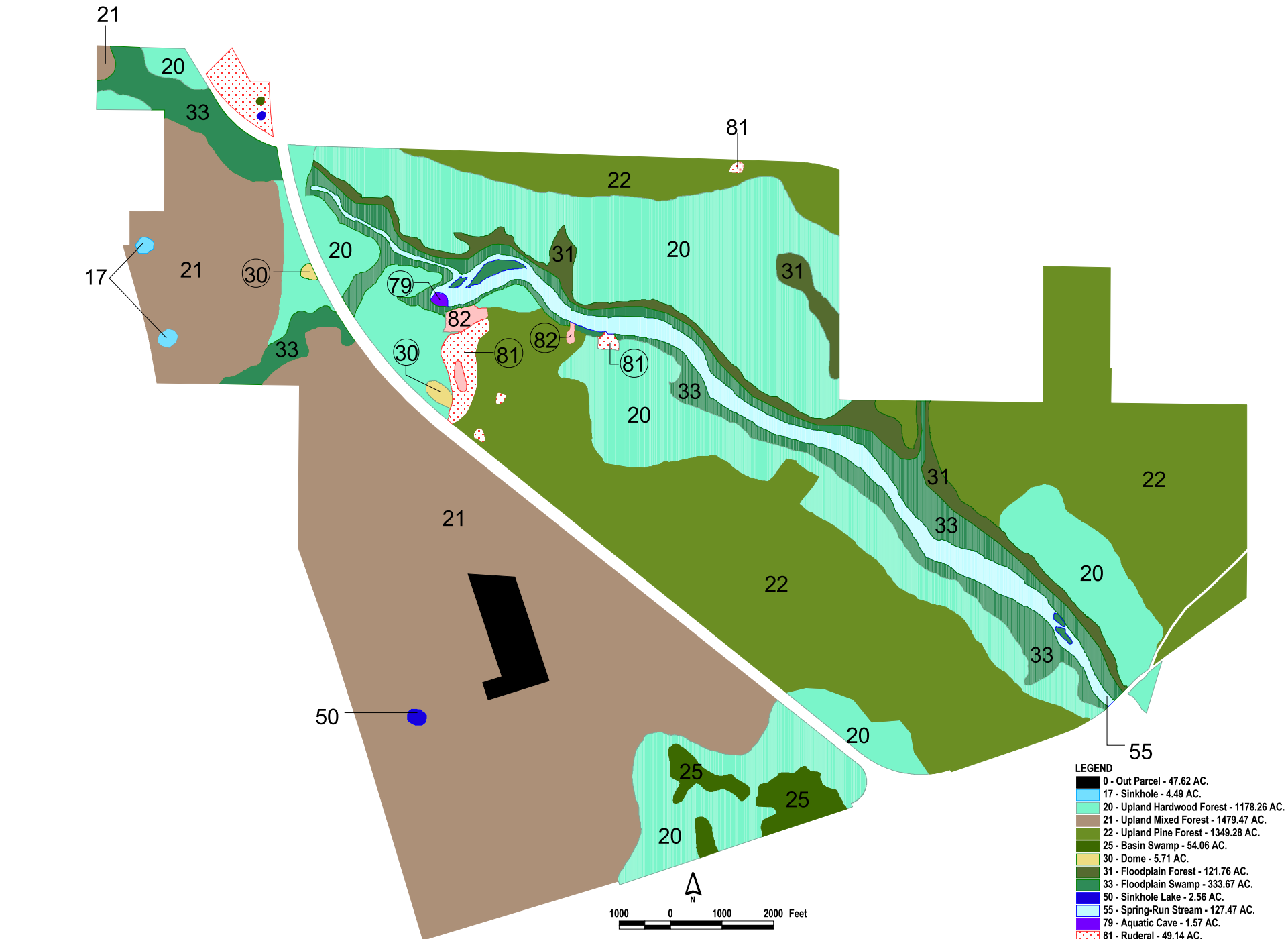
Several offsite springs flow onto the park and discharge into the Wakulla River. Indian Spring begins off park property then flows through Indian Spring Slough onto the northwest portion of the park where it merges with Sally Ward Spring and Creek and flows into the Wakulla River. Unlike Sally Ward Creek, Indian Spring Slough does not have a permanent flow and may stop flowing during dry periods. McBride Spring flows through McBride Slough on private property north of Highway 267. The slough flows due south onto park property and into the Wakulla River. Flow appears to be continuous. Three smaller springs within the boundary of the park form spring runs that flow into the Wakulla River. Two of these springs are in the northern portion of the park and the other is in the southern end, west of the river. The two northern springs flow off park property for a short distance then flow back onto the park and into the river.

Other smaller sinkholes, small basin swamps, shallow ephemeral ponds and permanent cypress domes occur on the park. Seasonal ponds are not mapped as distinct natural communities because of their small size. Nevertheless, they serve as important water resources and breeding areas for some of the wildlife of the park.

Natural Communities

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

The park contains 11 distinct natural communities (see Natural Communities Map) in addition to ruderal and developed areas. The acreage for each natural community is reflected on the Natural Communities Map. Park specific assessments of the existing natural communities are provided. FNAI descriptions of these natural communities are



LEGEND

0	- Out Parcel - 47.62 AC.
17	- Sinkhole - 4.49 AC.
20	- Upland Hardwood Forest - 1178.26 AC.
21	- Upland Mixed Forest - 1479.47 AC.
22	- Upland Pine Forest - 1349.28 AC.
25	- Basin Swamp - 54.06 AC.
30	- Dome - 5.71 AC.
31	- Floodplain Forest - 121.76 AC.
33	- Floodplain Swamp - 333.67 AC.
50	- Sinkhole Lake - 2.56 AC.
55	- Spring-Run Stream - 127.47 AC.
79	- Aquatic Cave - 1.57 AC.
81	- Ruderal - 49.14 AC.
82	- Developed - 10.71 AC.

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Natural Communities Map

contained in Addendum 4. A list of plants and animals occurring in the park is contained in Addendum 5.

Sinkhole. The sinkholes at Edward Ball Wakulla Springs State Park are surrounded by upland areas. They provide a very moist microclimate compared to the dry uplands. Because of this, sinkholes provide habitat for many species of salamanders and invertebrates that would be unable to survive in the drier areas. The sinkhole is also an important water station for wildlife living in and using the drier upland areas that surround them.

Upland hardwood forest. The upland hardwood forest community at Wakulla Springs is of two distinct forms. The original park area contains some of the oldest and most beautiful American beech-southern magnolia climax forest to be found in the South. State champion size magnolia, beech, basswood and sassafras trees have been identified since the establishment of the park in October 1986. These large beech and magnolia trees occur in several portions of the park.

This upland hardwood forest community is not the classic rolling hill, clayey soil type, but more typical of that which would occur on the flat Gulf Coastal Plain where fire has been excluded. The sections with the oldest hardwoods may represent virgin tracts where the river, the numerous limestone outcroppings and the swampy terrain protected the community from lightning fires. Younger sections may have replaced either extensively cut hardwood forest or may be a successional stage following early removal of sections of the pine-forest.

The second distinct form of upland hardwood forest is found on the property west of State Road 61. This area has an upland hardwood forest that has been mostly disturbed by a major timber-harvesting project. In 1987-88, this community was clear-cut of almost all-merchantable timber. Since the timber harvest, the area has been allowed to grow back naturally. This natural growth has resulted in a thicket of hardwood species including crabapple, laurel oak, winged elm, basswood, cherry, and magnolia. The trees are mostly 2-3 inches in diameter and 15-25 feet tall. There is little to no herbaceous understory growth. Access to the area is by established roads and trails only.

Upland mixed forest. This forest is similar to the upland hardwood forest but lacks the more mesic tree species such as American beech, swamp chestnut oak and American hornbeam. This is because the upland mixed forest is located on a sandier, drier soil and at a slightly higher elevation.

The upland mixed forest at Edward Ball Wakulla Springs State Park is located entirely on the property west of State Road 61. A major timber harvesting project similar to the harvest that occurred in the upland hardwood forest has disturbed this community. In 1987-88, this community was clear-cut of most merchantable timber. Since the timber harvest, the area has been allowed to grow back naturally. This natural growth has resulted in a thicket of mostly hardwood species including crabapple, laurel oak, sweetgum, dogwood and hawthorns. The trees are mostly 2-3 inches in diameter and 15-25 feet tall. There is little herbaceous understory growth.

There are some areas with small amounts pine growth present. The pine growth is mostly young slash pine occurring in areas that are more open with less hardwood growth and more herbaceous plant growth. Some smaller areas of longleaf pine regeneration have been discovered within this community. These longleaf pine areas are adjacent to dirt roads passing through part of the community. Some small amounts of wiregrass growth have also been observed in some of these longleaf pine areas.

Upland pine forest. The upland pine forest community at the park has mostly longleaf, loblolly and slash pines remaining in the canopy. This upland pine forest is not in classic, clay soil, rolling hill habitat, but is in the flatlands of the Gulf Coastal Plain, where shallow sandy soils cap a limestone stratum. While the upland pine forest is quite extensive, hardwood succession has been occurring in varying degrees. This has occurred because fire had been excluded from the property for at least 60 years before state ownership.

The longleaf pinelands on the property have a history of a century or more of disturbance. A few living pines remain on the property which show evidence of turpentine industry “cat faces”, angular gashes cut into the trees. These trees seem more common on the north side of the river but park-wide fewer than 1 percent of the remaining longleaf show the old catface turpentine scars. The trees large enough to be turpented 60 or more years ago were also eventually logged. Most of the existing longleaf pines on the property today had diameters of six inches or less and were less than 30 years old when the last round of turpentine and subsequent logging occurred. The largest longleaf and loblolly pines on the property today (those over 15 inches in diameter at breast height) are only 60-100 years old.

Logging, turpentine, agricultural practices occurring before 1935 and decades of fire suppression have resulted in the loss of pineland community keystone ground cover species throughout most of the original pine community. Hardwood invasion had, reduced light levels, so that little pine regeneration was occurring. Soil disturbance and reduced sunlight have also eliminated keystone pine community grasses such as wiregrass on most of the park. The only naturally occurring wiregrass community of subsequent size is located on the north side of the river. Extensive, recent prescribed burning has been an important pineland restoration tool. The burning in combination with individual removal of invading hardwood tree species has improved the natural species composition within portions of this community.

Basin swamp. The basin swamp soil is nearly level and very poorly drained. The soil is ponded for 4 to 6 months and has a seasonal high water table within a depth of 20 inches for most of the remainder of the year. The basin swamp soil for Edward Ball Wakulla Springs State Park is Tooles-Nutall fine sands, depressional.

The basin swamps at Edward Ball Wakulla Springs State Park are found in the southeastern portion of the property. A series of three basin swamp areas occur here. None of the basin swamps are connected, being separated by the higher elevations of the surrounding disturbed upland mixed forest. The basin swamps appear relatively undisturbed, with large mature trees present. These areas were most likely too wet to be logged when this property was timber harvested in 1987/88.

Dome. Periodic fluctuations of hydroperiods are essential for the maintenance of cypress dome community. The normal hydroperiod for domes is 200 to 300 days per year. Extended hydroperiods will limit tree growth and prevent reproduction, while shortened hydroperiods will permit the invasion of mesophytic species, which will change the character of the understory and eventually allow hardwoods to replace cypress.

In the park, two of the several solution depressions that occur within the upland pine and hardwood forest communities contain water for enough of the year and are large enough to support a cypress dome community. Fortunately, one of these areas is along the park entrance drive and is frequently visited by lodge guests on evening walks. This cypress dome has apparently been exempt from all timbering but selective cutting has occurred at the dome periphery. Individual trees toward the center of this community are very old.

Recent burning around the edges of the dome has reduced and eliminated some of the pine and hardwood tree invasion occurring near the dome. The other cypress dome is found on the new property adjacent to State Road 61. Timbering and the past construction of State Road 61 have disturbed this area. Most of the cypress trees have been removed from the interior portions of the dome. Gum and maple trees now dominate with smaller cypress trees at the edges. This dome is not as wet or large as the one on the park drive. This is mostly a result of the construction of State Road 61 that now bisects the eastern portion of this community.

Floodplain forest. The floodplain forest appears relatively undisturbed with large specimens of all representative tree species. Large cypress stumps occur both in the floodplain forest and floodplain swamp throughout the park. Cypress harvesting occurred in the past, possibly beginning as early as 1895, for both lumber and shingle production. However, numerous ancient cypresses were left uncut and are located along the 3 miles of the Wakulla River within the park.

Floodplain swamp. The pristine condition of the floodplain swamp at the park is perhaps the most visible natural community to most visitors. Bald cypress grows on natural mid-channel islands of the Wakulla River, giving park visitors the feeling of being surrounded by primeval, towering cypresses.

Parts of this community were altered somewhat by channel dredging and spoil deposition activities in the late 1960s. While the spoil banks have made some wildlife such as the alligator more visible, they have also increased the densities of willows and wax myrtle along the edge of the river. The Sally Ward Spring run was also significantly widened by dredging at that time, and many cypress trees along the spring run and through the “back jungle” section of the tour boat route were also sacrificed. While all these alterations are apparent in the upper river, conditions are pristine a short distance into the floodplain swamp and below the tour boat section. The floodplain swamps of Indian Spring Slough and McBride Spring Slough have been left relatively undisturbed.

Sinkhole lake. Cherokee Sink is considered a sinkhole lake and is located on the western portion of the park. Cherokee sink is quite large and has steep limestone walls on several sides. Its water depth is estimated to be about 60 feet. Vegetation in the sink is limited to some submerged and emergent aquatic vegetation. Fish, turtles and snakes have been observed in the water. The area immediately surrounding the sink is vegetated by mostly upland species such as longleaf pine, bracken fern, wax myrtle, laurel oak, and southern red oak.

Cherokee Sink has a long history of local use as a swimming area. Due to this use and unrestricted access, Cherokee Sink is heavily disturbed. Numerous trails lead down to the sink and several dirt roads encircle the area around it. Because of these trails and roads, soil erosion is severe. Sedimentation of the sink from erosion has been occurring for several decades. This sedimentation has slowly filled portions of the sink with a thick layer of sand and silt and has most likely affected its exchange of water with the associated karst environment. Over the years, trash dumping has also been a problem at the sink. The bottom of the sink is covered in an array of human garbage including drink cans, glass, plastics and several larger objects. The land area surrounding the sink is also a collection of human refuse including mostly cans, glass, and plastics. Nearly 100,000 pounds of trash was removed from the property west of State Road 61 before state ownership.

Spring-run stream. The Wakulla River is approximately 250 feet wide along its 3-mile length within the park. The surface area of the river is approximately 95 acres. Three

significant channel features are Sally Ward Spring and other unnamed springs, their respective spring runs, and McBride Slough which enters the park from the north. Other springs contribute to the Wakulla River but not through well-defined channels.

The section of the Wakulla River within the park is as close to the primeval condition as can be found for a system of this sort. The density and variety of fish, aquatic reptiles and birds attest to the productivity of the spring and river. The abundant aquatic vegetation of the river, which includes the typical eelgrasses (*Vallisneria* and *Sagittaria*), Illinois pond weed, southern naiad, chara, pickerelweed, duck-potato and smartweed, is the base of a complex food chain. This system is currently threatened by hydrilla, an exotic aquatic plant, which is actively expanding at the expense of the native eel-grasses. Not present in the spring or river before 1997, hydrilla dominates the spring at all depths, has vegetatively spread the length of one mile down river within the park and is growing in spots two miles down river.

Good water chemistry and some flow statistics have been recorded and maintained for Wakulla Springs over the years. In recent years, the park itself has taken on the task of collecting water samples, so a dependable, constant database is developed. This makes the spring and river an important location for hydrological research and a promising location for biological research.

Aquatic cave. The aquatic caves at Wakulla Springs are some of the best explored in the world. These systems are massive and involve areas outside the park. These cave systems have not been completely explored, and Wakulla Spring may be connected with other major karst features in the area.

Ruderal and developed areas. The ruderal and developed areas make up a small portion of the park. These areas include the lodge complex and associated buildings, the formal grounds around these buildings, the Ranger Station and associated park entrance area, three mobile home residences, a warehouse/dry dock area, the park manager's residence, a fenced shop complex, the picnic area, parking lots, the greenhouse, the park's administrative offices, a mowed wildlife observation area, and a small vegetation disposal site.

Designated Species

Designated species are those which are listed by the Florida Natural Areas Inventory (FNAI), U.S. Fish and Wildlife Service (USFWS), Florida Fish and Wildlife Conservation Commission (FFWCC), and the Florida Department of Agriculture and Consumer Services (FDA) as endangered, threatened or of special concern. Addendum 6 contains a list of the designated species and their designated status for this park. Management measures will be addressed later in this plan.

From the plant and animal inventories, 34 designated species are recorded for the park to date. These species include 4 plants, 4 reptiles, 19 birds, 3 mammals and 4 arthropods. Most of the animals are associated with the Wakulla River and are safe as long as the habitat remains in good condition. It should be noted that the golden eagle and snail kite are only rare transients in this region. The golden eagle has been seen only once in the last 10 years and only five or 6 times in the last 35 years. The snail kite is recorded from a single four-month visit in the late 1950s. The wood stork rarely visits although it is a year-round resident in the region. The northern harrier was most likely recorded as a fly-over observation. The gopher tortoise and Sherman's fox squirrel's range in the park have been expanding recently. This is due to the increased application of prescribed fire now being conducted by park staff. New recruitment of gopher tortoise is evident from burrow surveys done after each prescribed burn. Recorded observations of both the gopher tortoise

and Sherman's fox squirrel are now more frequent and from expanded areas. Expansion of populations should continue as the prescribed burning program progresses.

On August 8, 1997, a group of four manatees was observed in the Wakulla Spring basin. The three adults and one calf were the first documented sighting of manatees in the spring basin. They stayed in the spring basin area for three days before returning to the lower part of the Wakulla River. In December of 2000, a single young manatee was observed in the spring basin. The manatee remained in the spring and upper portion of the river for 4 days before he left park waters. Manatee sightings are common on the lower portion of the river during the non-winter months.

Special Natural Features

The park contains several outstanding features, the most notable of which are the huge main spring with its aquatic cave fauna and fossil Pleistocene mammal remains, and the spring run which supports a great diversity and abundance of wildlife. Wakulla Spring is considered one of the world's largest and deepest freshwater spring. The spring is 185 feet deep where the cave system begins. The spring bowl, the area where the water flows out, is almost four acres in size. Other minor springs add to this collective feature. Also of major importance is the abundance of old-growth trees, including virgin bald cypress throughout the river floodplain, and champion-size southern magnolia, American beech and other hardwood species in sections of the park. Some of the bald cypress trees on the river have had their age determined through growth ring analysis. Based on this analysis, the age for some trees range from 400 to 600 years old.

Cultural Resources

Evaluating the condition of cultural resources is accomplished using a three part evaluative scale, expressed as good, fair, poor. These terms describe the present state of affairs, rather than comparing what exists against the ideal, a newly constructed component. 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 judgment is cause for concern. Poor describe 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 to reestablish physical stability.

Humans have occupied and used Wakulla Springs for nearly 15,000 years. Archaeological evidence shows intermittent habitation from PaleoIndian times through the time of European contact (1513), with significant PaleoIndian, Archaic, Deptford, Swift Creek, Weeden Island and Fort Walton period sites. Later periods are also represented, particularly Spanish mission (Wa321), Creek and Seminole (Wa312). Late nineteenth and early twentieth century use included heavy timbering, farming and naval stores activities. The acquisition of the area by Edward Ball in 1934 resulted in its development as an attraction that focused on the preservation of wildlife and the conservation of natural features. The Wakulla Springs Lodge, designed by the firm of Marsh and Saxelbye of Jacksonville, is an excellent example of the use of Mediterranean Revival architecture. The Florida Master Site File maintains a list of cultural sites within the park (see Addendum 7).

Edward Ball Wakulla Springs State Park encompasses highly significant prehistoric and historic cultural resources and was nominated to the National Register of Historic Places as an archaeological and historic district in 1992. Because the park contains archaeological evidence for every period of the aboriginal cultural sequence from PaleoIndian times

through European contact, the site has the potential to yield significant information concerning changing settlement patterns on Florida's north Gulf Coast. In addition, the park contains significant historic resources relating to the turpentine and naval stores industries during the nineteenth century and the development of tourism during the twentieth century.

Wakulla Springs has been studied since the nineteenth century. The spring was well known to paleontologists since approximately 1850, when "Professor King" of Newport, Florida, recovered skeletal materials of a mastodon. Other mastodon remains were found during the late nineteenth and early twentieth century. Following the report of some 600 bone points found in general association with extinct Pleistocene elephant remains from the underwater cave area of the springs (Olsen 1958), attention turned to PaleoIndian remains: Suwannee projectile points, bone points, and the remains of sloth and deer, in addition to megafauna. The archaeologist Wilfred Neill described what he saw as PaleoIndian kill sites similar to Clovis sites reported in the American southwest (Neill 1964), making Wa24 one of the type sites cited to support the concept of PaleoIndian big game hunters in Florida. In 1988, staff of the Department of State, Division of Historical Resources, Bureau of Archaeological Resources, conducted a limited archaeological survey. More recently, B. Calvin Jones uncovered impressive Paleolithic tools (Suwannee Simpson biface; Suwannee fluted points) during testing in advance of construction for a sewage collection system in 1995.

The following represents the assessments for those sites that could be visually inspected. Evaluating the condition of cultural resources is accomplished using a three-part evaluative scale, expressed as good, fair, or poor. Those terms describe the present state of affairs, rather than comparing what exists against the ideal, a newly constructed component. 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 judgment is cause for concern. Poor describe an unstable condition where there is palpable, accelerating decline, and physical integrity is being compromised quickly. A resource in poor condition suffers obvious decline in physical integrity from year to year. A poor condition suggests immediate action to reestablish physical stability.

The area of the Wakulla Springs Lodge complex features the most publicly visible cultural resources, consisting of 8Wa24, the submerged area in and around the spring; 8wa305, the six structures and the roads and walkways of the lodge complex; and 8Wa329, the upland area surrounding the lodge building.

Briefly, the Wakulla Springs spring boil, 8Wa24, was the site where mastodon skeletal materials and worked stone and bone artifacts were recovered. The lodge complex holds evidence about twentieth century development in the area, while the upland area on which the lodge complex sits contains evidence for intermittent aboriginal habitation over several thousand years.

Most visible elements of these three resources are in fair to good condition, although each has been greatly disturbed or modified. Because the area occupied by these sites is used heavily by the public—the spring and lodge complex are the focus of most visitation—all suffer from daily wear and tear which threatens the integrity of each. While these three sites constitute approximately 4.2 percent of the total park area, their management amounts to at least 85 percent of the cultural resource management program of the park.

For the purpose of cultural resources management, the park is divided into two zones: the lodge complex and the undeveloped area.

The lodge complex. Cultural resources of the lodge complex include the structures, roadways, and terrain alterations that facilitate operations of the lodge and spring; the resources beneath this landscape; and the underwater area of the spring.

The park contains 23 buildings or structures. The lodge and support buildings were designed and constructed as uncomplicated, utilitarian structures, and they have been little altered throughout the years. Seven of these are associated with the Wakulla Springs Lodge complex that Edward Ball built between the mid-1930s and 1942. The remaining 16 structures are nonhistoric buildings associated with the maintenance or use of the park. The visible elements of the resources in this zone are in fair to good condition, with the exception of the roof and ceiling of the lodge, which are addressed below.

The Wakulla Springs Lodge is a two-story Mediterranean Revival building, shaped like the Greek letter pi. It has textured stucco exterior, arched entries, and low pitched, side gabled roof. The roof surface of the main block and wings of the building is asbestos, but an attached hip roofed loggia on the north elevation is covered with its original metal Spanish barrel tile. The roof is in poor condition and the park has drafted a proposal for its replacement. Fenestration includes arched, 4-light casement windows on the first story, and rectangular, 3-light casement windows on the second story. These have been replaced with more modern windows that are sympathetic with the structure although they do not replicate the originals. Three exterior stuccoed chimneys are located on the elevations of the courtyard located on the south side of the building.

Within the structures, the lobby is the most heavily used area of the lodge and is the only surviving significant interior space. It has marble tile floors, wainscoted and plastered walls. It is generally in fair condition. The elaborately painted ceiling in the lobby is in fair to poor condition, having suffered water damage. The kitchen was refurbished and expanded in 1995-96 and is in good condition. The nearby bathhouse has been improved and restored in recent years and is in good condition.

Significant cultural resources, both recorded and unrecorded, are located below grade in the lodge complex. Park and District staffs are mindful of threats to the integrity of the resources and follow DHR policy relating to Chapter 267, F.S., whenever ground-disturbing activities are necessary. For example, significant PaleoIndian artifacts became known during approved archaeological testing in advance of sewer line replacement during 1995.

Undeveloped area. Discussion is limited to the sites that are visible in this area. 8Wa309 is a Weeden Island mound complex consisting of Deptford and Weeden Island components. The site comprises two sand ceremonial/burial mounds (A and B) and a small related Weeden Island occupation that includes Wa330. Both Mound A and B appear to be in fair condition, with no recent evidence of potholing or animal rooting. One large old looter hole should be filled. The larger of the mounds has trees, some quite large, growing on it; these include southern magnolia, beech, sweetgum and dogwood. There is a crescent-shaped borrow pit located immediately northwest of the mound. Mound B is linear (c. 15 x 5 meters) and is located about 65 meters northeast of Mound A. The associated circular borrow pit is adjacent to the mound to the southwest.

The Apple Snail site (8Wa00539) also contains an aboriginal mound that appears to be in good condition. One large southern magnolia and numerous young ironwood (*Carpinus caroliniana*) are growing on it. These are the largest of the known mound sites in the park.

Other sites have not been inspected since the last resource management evaluation conducted in 1993 by the Division.

8Wa330 is a Weeden Island habitation site with a minor Fort Walton or Leon-Jefferson component. The site is located on a roughly circular slightly elevated area approximately 20 meters in diameter. This feature may be a natural rise, but the possibility exists that it may be a low burial mound associated with Wa309. It appears to be in good condition.

Wa311 and Wa319 contain the remains of a historic turpentine distillery. They are located between the Wakulla River and the 10-foot contour, at the junction of two traditional sites (the park road along the contour and the road now designated as State Road 365) and the Wakulla River. The historic earthwork identified as Wa328 is located across the river from this area. It is approximately 2 meters high, 3-4 meters wide and 65 meters long. The site, which may represent the remains of an early logging operation, appears to be in good condition. At the time of this writing, sufficient information does not exist to ascertain whether the still and the logging operation responsible for constructing the earthworks were connected to help supplement the modest subsistence agriculture of the area.

Wa326 contains the only physical evidence for the population of African Americans living in the vicinity during the first half of the twentieth century. The site is an early-to-mid 20th century house site that is approximately square with dimensions of 50 by 50 meters consisting of limestone fragments, bottles, metal containers. It appears to be in good condition.

RESOURCE MANAGEMENT PROGRAM

Special Management Considerations

Timber Management Analysis

Chapters 253 and 259, Florida Statutes, require an assessment of the feasibility of managing timber in land management plans for parcels greater than 1,000 acres if the lead agency determines that timber management is not in conflict with the primary management objectives of the land. The feasibility of harvesting timber at this park during the period covered by this plan was considered in context of the Division'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 early successional communities such as sand pine scrub and coastal strand.

Edward Ball Wakulla Springs State Park has three areas of planted slash pines where timber harvesting would aid in the restoration of these disturbed sites. These areas include a 100-acre pine plantation and two sites that are completely stocked in slash pine and will require a thinning and then a restocking of longleaf pine to begin restoration. Addendum 8 contains the timber management assessment for the park

Additional Considerations

Management of natural communities is often enhanced by physically restoring areas that have been disturbed or otherwise manipulated by people. Such is the case at Wakulla Springs where most of the upland pine areas have been manipulated by human activities such as farming, turpentine for navel stores, timbering, and the practice of complete fire exclusion of the upland forest for the last 60-80 years. These practices have removed much of the native wiregrass from the park. Wiregrass is now only found naturally occurring on the north side of the river, in an area of about 80 acres located in Burn Zone E. Before these human disturbances, wiregrass probably occurred on most of the upland areas of the park. A priority of the park staff's management consideration is the restoration of the

disturbed upland sites. This restoration process has been implemented primarily through three management practices, prescribed burning, selective hardwood tree removal, and planting native plant species.

The vast majority of the western portion of the park has also been disturbed. This includes most the upland areas and Cherokee Sink. The upland areas were mostly clear-cut of most timber in 1987/88 and have since grown into a natural thicket of hardwoods. Cherokee Sink has suffered from unrestricted human use for several decades. Soil erosion and trash dumping have degraded this natural feature. Both of these areas are in need of review and planning for their future use and restoration.

Prescribed burning is now occurring on 1,100 acres of uplands. Burning is done every 2-3 years on most of these sites. Burns are usually done in the late winter and early spring. The burning has helped to remove small invading hardwood trees and promote the flowering and seeding of native species. Burning has opened areas up for use by wildlife and encouraged the growth of native, fire-adapted plant species that are used by wildlife. Larger invading hardwood trees have been controlled in selective upland areas. Hardwood control using fire is effective in only controlling hardwood trees that are 4 inches or less in diameter. Larger trees must be girdled and treated with an approved herbicide and left standing. The large hardwoods have limited the success of burning in many areas. After the trees are killed, burning is more effective due to the absence of the thick, moist leaf layer and shading caused by these trees. Selective hardwood removal has been conducted in Burn Zones A, D, E and I. Transplanting of native upland species has occurred at the park since 1990. Wiregrass clumps from nearby, non-park areas, have been transplanted successfully in to several burn zones. The wiregrass clumps also contain other native upland species that are a part of the plant community. The establishment of wiregrass at select locations has been done in hopes of establishing a native seed source that will aid in the natural recruitment of native fire-adapted species of the uplands. This natural restoration must be maintained and moved along by the prescription of frequent fires. Priority for restoration efforts is given to those sites that include the greatest biodiversity desirable for the long-term health of natural communities. Expansion of such sites will provide the necessary seed source for similar, adjacent natural communities that are currently degraded.

The park's lower portion of the Wakulla River and the large land area south of the river and mostly east of the shop complex have been treated as sanctuary areas for the last 70 years. Public access to these areas is restricted. Only groups that are escorted by a park staff member are allowed to visit the protected land area. No groups are allowed on the lower portion of the river. Permitted research is allowed in both of these restricted areas. Due to this protection, wildlife diversity in both areas is high. The lower portion of the river is home to several bird rookeries. This includes a rookery of up to 500 double-crested cormorant nests. Other nesting colonies include great egrets and cattle egrets. Individual birds also nest through out this area. There is also a successful bald eagle's nest that has been actively inhabited for the last eight years. In January of 1999, during a full river wildlife survey, a roosting colony of Southeastern bats (*Myotis austroriparius*) was discovered in a cypress tree in the middle of the river. This is the only documented case of this bat species roosting in a tree surrounded by water in the state of Florida. The largest alligators on the river are located mostly in this area. The land area has large populations of whitetail deer and turkey, as well as gopher tortoise, Sherman's fox squirrel, bobcat, and hawks. Access to the area north of the river has been limited in the past. In 1999 access for the public was increased by the construction of a parking lot and extensive trail system. With the increased use of the north side, the wildlife sanctuaries of the park to the south

should remain intact and undisturbed as they have been for the previous 70 years.

Known cultural sites are recorded on maps and provided protection. Cultural resources must continue to be protected from park activities including prescribed burning, fire break construction, and any other management activities. Management practices that can have possible impacts on a cultural resource must be planned and conducted to eliminate or minimize impacts to the resource.

Management Needs and Problems

The control of the exotic plant hydrilla in the Wakulla River must be maintained and expanded. The Hydrilla Management Plan, which has been implemented, will require periodic updates and revisions. Additional funding for more intensive removal efforts will be sought from several funding sources. Research on hydrilla in the Wakulla River will continued to be promoted by park staff.

The burn program must be maintained and expanded at Wakulla Springs. Park staff must insure that burn zones are burned within their recommended period and that the burn rotation is every 2-3 years. When burning is conducted, expansions of the burn areas are attempted by pushing fire into surrounding hardwood/pine areas. The property west of State Road 61 needs to be surveyed and a determination made as to what new burn zones will be added there.

Continue restoration of the upland pine areas of the park. The western portion of the park property should be reviewed and a restoration plan developed for areas that are deemed in need of restoration. Areas must be prioritized and scheduled for hardwood control and transplanting or seeding native plant species. There is much to do before prescribed burning is conducted as maintenance to upland pine areas. However, yearly photo plots reveal much progress has been made since state acquisition and prescribed burning has been implemented.

A review of the Cherokee Sink area needs to be conducted and a management plan for this feature developed. The review will help determine the condition of this feature and its management needs. The management plan will need to address; clean up of the sink, restoration of the sink and its surrounding area, cultural resources of the sink, public access to the sink, and public use of the sink.

Continue to conduct wildlife surveys to identify wildlife in the park at various times of the year. Surveys such as the full river survey, boat tour route survey, Christmas bird count, and osprey/bald eagle nest survey, have been conducted since state acquisition. These surveys serve as a barometer for wildlife populations.

Little or no continuous baseline of water quality data collection has been conducted on the spring or river. The Lake Watch Program is the only collection of data presently being done on a continuous basis. This program only provides a minimum of data. Although a number of organizations have conducted periods of study, no long-term data of spring water quality data exists. A coordinated, long term monitoring and data reporting system for water quality needs to be established. Some type of water sampling of Cherokee Sink should also be established, especially if human use of this resource is to continue.

Water clarity/visibility also needs to be monitored for Wakulla Spring and any relationship it may have with rainfall events. Estimation or use of a secchi disc measures visibility of the spring. Rainfall is recorded daily at the park entrance station using a rain gauge. Both spring visibility and daily rainfall can then be tracked and compared for any pattern or relationship that is observed.

The pattern of flow of the Wakulla Spring cave system needs to be determined and if the Wakulla system is connected to any other system. Additional flow information will be beneficial and can be used in the comparisons of rainfall, water clarity/visibility and water quality. Great strides in mapping of the conduit system have been made in the last five years. The continued exploration and mapping of the system is paramount in providing protection to its resources. Locating subterranean features on the land surface is equally important for planning purposes.

Park staff needs to continue to monitor for any additional infestations of exotic plants on the park and remove or treat. The western portion of the park is in need of a thorough survey to determine what exotic plants are present and establish a treatment plan. Exotic terrestrial plants have been aggressively treated and have not spread from their initial locations. Park staff needs to remain diligent in treating exotic plants.

Populations of designated species within the park need to be protected and monitored. Species such as the Limpkin and Swannee cooter need to have their populations monitored on a regular basis. Monitoring of the bald eagle's nest needs to continue in concert with the Florida Fish and Wildlife Conservation Commission. Populations of gopher tortoise and Sherman's fox squirrel need to be monitored to see how they are responding to the restoration efforts of the upland pine areas.

Improved drainage and erosion controls for the swimming area beach are a need. Restoration of the eroded beach areas needs to be performed.

Additional use needs to be made of today's technology to monitor the results of resource management practices used at the park. The District 1 biological staff has access to some of this technology and can assist the park in establishing its use.

To meet the challenge of managing the hydrilla infestation at Wakulla Springs and to manage the resources on an additional 1,863 acres, additional park staff positions are required. Two FTE positions are needed to meet these new demands. One position would be assigned to deal with hydrilla removal and research. The other position would be responsible for assisting with the management of the resources on the additional park lands that are west of State Road 61.

Cultural resource management needs and problems at Edward Ball Wakulla Springs State Park are few, and they can be addressed in a straightforward manner.

An archaeological survey of the western portion of the park needs to be conducted. Of special interest is the report or rumor of a 1900s cemetery located near Cherokee Sink. The history of land use for this area also needs to be researched.

Cultural resources of the lodge complex include the structures, roadways, and terrain alterations which facilitate operations of the lodge and the spring; the resources beneath this landscape; and the underwater area of Wakulla Spring. These resources receive heavy public use; consequently, their integrity is constantly threatened. The visible elements of the resources in this zone are in fair to good condition. In the case of the structures, restoration or replication of original features, such as roof fabric, may be considered at the time when cyclical replacement of more recent substitutes is appropriate. The lodge and support buildings were designed and constructed as uncomplicated, utilitarian structures, and there has been little change through the years. Therefore, except for matters like roof fabric, "restoration" is not an issue.

The lodge structure itself has remained unchanged for the most part. The kitchen area was modernized in 1997 and additional floor space was added. The lobby, which is among the

most heavily used area of the lodge, has remained unchanged. This space is in fair condition; its painted ceiling is in fair to poor condition. The massive fireplace is structurally sound but the damper no longer functions properly. Protective activity is accomplished through park review of ordinary maintenance activities performed by the maintenance and custodial staff and from advice by the Bureau of Natural and Cultural Resources.

Significant cultural resources, both recorded and unrecorded, are located below grade in the lodge complex. Threats to their integrity are taken into account by park and District 1 staff in accordance with procedures relating to Chapter 267, F. S., whenever ground disturbances are necessary. Under present circumstances, no independent cultural resource survey of this zone is planned; however, whenever the area is subject to further development, such a survey must be performed as an integral component of the development project itself.

Threats to resource integrity of cultural resources in the undeveloped areas of the park are for the most part, caused by the effects of rooting animals, weather induced damage, and vegetative growth. Public impact on these resources is minimized by limited access to the areas. As noted above, these resources are in good condition and no known looting of sites has occurred.

Management Objectives

The resources administered by the Division are divided into two principal categories: natural resources and cultural resources. The Division's primary objective in natural resource management is to maintain and restore, to the extent possible, to the conditions that existed before the ecological disruptions caused by man. The objective for managing cultural resources is to protect these resources from human-related and natural threats. This will arrest deterioration and help preserve the cultural resources for future generations to enjoy.

Specific objectives for managing the natural resources of the park are as follows:

1. Increase efforts to remove hydrilla from the spring and river to lessen the impact of the plant on the river ecosystem. Additional methods of control will be researched and if approved, enacted to provide better results from control actions.
2. Compile a written report on the Full Wakulla River Wildlife Survey. This report will provide a history of the survey and list the data collected from the surveys.
3. Continue to expand prescribed fire efforts. Expanding burnable areas in burn zones through hardwood controls and burning under proper conditions. Determine burn zones in the western portion of the park. These new zones will be based on restoration needs and the plant community present.
4. Continue efforts to monitor water quality of Wakulla Spring and Wakulla River. Work with other agencies to collect and share water quality data.
5. Start an effort to monitor the water quality of Cherokee Sink.
6. Continue to record and graph the visibility of Wakulla Spring and the daily rainfall for the park. These measures can continue to be monitored and compared for any observed relationship.
7. Continue to have approved volunteer groups explore and map the cave system of Wakulla Spring. This exploration may prove to be the key to solving the flow of this system, determining if this system is connected to other systems, and answering the often-asked question, "Where does all this water come from?"
8. Explore the Cherokee Sink subterranean system and determine its physical state and condition.

9. Develop a restoration plan for the Cherokee Sink area. This plan will address clean up of the site, erosion controls, access and use of the sink, and restoration of the sink and its surrounding area.
10. Continue efforts to remove exotic species from the park.
11. Continue efforts to protect and monitor designated species within the park through maintenance of boundary fencing, conducting surveys and research.
12. Expand natural community restoration efforts by prescribed burning, hardwood controls and transplanting of native species. Determine what upland areas in the western portion of the park are candidates for natural community restoration.
13. Reduce erosion that is occurring at the swimming area beach. Improved drainage of rainwater and renourishment of the beach sand will be attempted to correct the soil erosion occurring at several locations.
14. Establish a park GIS program for natural resources at Wakulla Springs with the assistance of District Biological staff.
15. Specific objectives for managing the cultural resources of the park are as follows:
16. Restore the landfill/dump complex. This will require the placement of clean fill dirt in the excavated pits and reintroduction of native plants to restore the area to the surrounding natural community.
17. Have an archaeological survey conducted on part of the western portion of the park. Included will be the determination of evidence of a 1900s cemetery near the Cherokee Sink area, as well as, any other significant archaeological findings.
18. Develop and adhere to appropriate cyclical management schedules for management of structures associated with the lodge complex including documenting the site file on any changes made.
19. Develop a phased plan for managing the identified cultural resources in the context of their surroundings.
20. Maintain a set of files for each established site. Document any activities such as maintenance, unauthorized use or other impacts and new findings that occur for each site.
21. Conduct ground disturbing activities in accordance with DHR policy.
22. Maintain and protect archaeological sites and their associated artifactual assemblage from vandalism, erosion and other forms of encroachment.
23. Regularly patrol sites and assess the condition of recorded and unrecorded cultural resources. Monitor sites in poor condition and those threaten by public use.

Management Measures for Natural Resources

Hydrology

The Wakulla Springs Water Quality Working Group has been formed to help determine and protect the water quality of Wakulla Spring and the Wakulla River. This group of about 40 representatives of concerned groups and individuals has completed research on the history of water quality data collection for the spring and river and has made recommendations for future data collection. Some of the recommendations have been enacted including; 1) a current meter installed at the mouth of the Wakulla cave, 2) the installation of a hydro-lab water sampler at the headwaters of the river, 3) collection and analysis of additional water samples gathered by cave divers, 4) installation of additional testing wells in the Wakulla Spring area, 5) replacement of the water sampling tube at the spring, and 6) continued meetings of this group. This group has been a major influence in generating cooperation and closer coordination of work efforts among the several agencies that are charged with protection of the water resources.

There have been three major dive exploration efforts since Wakulla Springs became a state park. The first was the Wakulla Project in 1987 that mapped a portion of the cave system, collected samples of water and fauna from the cave and explored a portion of the Sally Ward Cave. A twenty man diving team from the U.S., Mexico, and Great Britain extended exploration and mapping efforts during the October-December 1987 Wakulla Dive Project. The team discovered four major conduits that converge into a main tunnel leading into the Wakulla Springs cavern entrance. None of the four tunnels was traced to their origin, despite penetrations of 4,176 feet, 3,600 feet, and 2,684 feet in tunnels B, D and C respectively. "A" Tunnel which passes southward under State Road 61 pumped tannic water at the same time "D" tunnel running northward, "B" tunnel running northeast, and "C" tunnel running southeast then south were pumping clear water. The main tunnels are interspersed with unexplored side tunnels and rooms which ranged as large as "The Grand Canyon", a huge chamber 100 feet high and 150 feet across. Explorers reached a maximum vertical depth of 360 feet in B tunnel.

A second Wakulla Project was conducted in late 1998 and early 1999. This project, called "Wakulla II" conducted additional mapping of the cave systems using a 3-D video mapper. Also mapping of the cave system on the surface was done for the first time ever. This surface mapping gives park staff a surface location that follows the path of the below ground conduit system.

A third exploration project has been ongoing at the park since 1991. This long-term project has been conducted by the Woodville Karst Plains Project (WKPP) group. This group has performed multiple dives at Wakulla Spring and Sally Ward caves. They have also attempted to dive the smaller springs in the park as well as all springs and cave systems in the Woodville Karst area. The WKPP have discovered 15 tunnels within the Wakulla system and have mapped almost 15 miles of cave system at the park. They dove over three miles in length in one tunnel and have gone to a depth of more than 300 feet. They have determined the conduits that carry the dark, tannic water, and those conduits that are always filled with clear water. In addition to their dives, the WKPP has assisted the park, and several other agencies and individuals, by collecting water samples from individual conduits, providing interpretation of their dive experiences and assistance in educating the public on the Woodville Karst system.

With the recent purchase of the western portion of the park, Cherokee Sink is now a resource of Edward Ball Wakulla Springs State Park. As stated earlier, Cherokee Sink has been disturbed by a history of unregulated use and access. As state park property, a plan will be developed to address the need for restoration of this resource, its protection and how to regulate its use and access by the public.

Three areas of concern exist for water protection. The first concern is the increase of "dark water" days for Wakulla Springs. "Dark water" days occur when the visibility of Wakulla Spring is less than 75 feet and the glassbottom boats can not run. The park has been able to track when glassbottom boats run since 1986. The data of this tracking shows that glassbottom boats run less than 50 percent of the time. The visibility of the spring has been measured since 1994. This data shows an apparent relationship with rainfall and visibility. Park staff will continue to collect this information.

The second concern is runoff and sedimentation from park roads, particularly the Park Drive near Sally Ward Spring and the Lodge Drive near two sinkholes. The park has been approved for a Federal/Florida Department of Environmental grants under the 319 Non-Point Source Grant Program. This program will provide funds to develop stormwater improvements to the road drainage of park roads in the two above-mentioned areas. These

road improvements will reduce surface runoff and better protect the water quality of the park. These improvements should be completed by June 2001. This grant will also provide funds for the park to develop additional public education materials on water quality of the springs and river.

The third concern is the continued erosion of the beach and lodge grounds at the swimming area. The park has been granted a five-year permit by the U.S. Army Corps of Engineers and the Florida Department of Environmental Protection to renourish the beach area by dredging the swimming area. A retaining wall was installed to reduce erosion and was a requirement of the permit. The Florida State University Anthropology Department has made two attempts at dredging this area. These two attempts have met with minimal success and the effects of the erosion are present. Additional, more intense dredging will be required to relocate soils that have eroded in to the river. The use of part of this area as an access point for vehicles removing collected hydrilla will continue to degrade that portion of the beach. The continued heavy visitor use of this area will also require ongoing maintenance dredging and a permanent fix is not likely to occur.

The park became a member of the Florida Lakewatch Program in April of 1996. Edward Ball Wakulla Springs State Park was the first spring/river to become a member of this program. The Lakewatch Program analyses monthly water samples collected by park staff. The monthly samples are collected from three sites in the spring and river. The samples are analyzed for, visibility, total phosphorus, total nitrogen and chlorophyll. This database of over 4 years of samples is probably the most dependable, although not detailed enough, sampling data that has been collected by Wakulla Springs.

Prescribed Burning

The objectives of prescribed burning are to create those conditions that are most natural for a particular community, and to maintain ecological diversity within the unit's natural communities. To meet these objectives, the park is partitioned into burn zones, and burn prescriptions are implemented for each zone. The park burn plan is updated annually to meet current conditions. All prescribed burns are conducted with authorization from the Department of Agriculture and Consumer Services, Division of Forestry (DOF). Wildfire suppression activities will be coordinated between the Division and the DOF.

The goal of the Wakulla Springs burn program is to expand all burn zones to their maximum area of fire-type community. Disked interior firelines are discouraged and fires are allowed to burn naturally into surrounding areas in an effort to increase the burned areas. Much of the characteristics of these fire-type communities have been lost over the last 60-80 years because of a lack of fire occurring in these areas. Upland hardwood trees such as laurel oak, sweet gum, and dogwoods have invaded these sites due to this lack of fire. This hardwood invasion has changed the make up of these fire-type communities and put them well on their way to succession from an upland pine community to an upland mixed/hardwood community. With succession, the characteristics of the open, pine-dominated community with its lush vegetative ground cover are being lost. The invading hardwoods provide more shade that reduces the growth of herbaceous ground cover. This loss of ground cover makes these areas less attractive to the wildlife of the upland pine community. Deer, turkey and quail have less cover for protection, and gopher tortoise and Sherman's fox squirrel have less open areas to move from site to site. The loss of ground vegetation had forced the gopher tortoise to move to the edges and roadsides of these areas in order to find it's food source of lush grasses and weeds.

The burn program at Edward Ball Wakulla Springs State Park has been in progress for 12 years. Since the first six test burns of a total of 12 acres in March of 1988, the burn

program has expanded to 14 burn zones covering approximately 1,100 acres (see Burn Zone Map). In a 12-year period 68 prescribed burns have been conducted. These fires have burned an estimated 3,500 acres. The results of this burning have been excellent. Constant, repetitive burning of these zones on 2-3 year rotations have provided positive impacts to the upland community. Hardwood stocking has been reduced, herbaceous plant growth has increased and desired wildlife species have increased and moved into new areas. The prescribed burning in combination with other restoration efforts has halted the progression of succession in many of the upland areas.

The burn program of the park originally concentrated on late spring and summer burning after an initial winter burn to reduce the 60-year-old fuel load. Prescribed burning in the late spring and summer has been difficult in some zones. High concentrations of hardwoods, lack of native grasses, and high moisture content of hardwood leaf litter has limited the effectiveness of burns done at those times. These conditions have forced park staff to conduct burns in the late winter and early spring for some zones and parts of other zones. The weather conditions for these late winters, early spring burns have been excellent with low humidities, higher winds and drier fuels. The results of these burns have been excellent. Burn zones have been expanded and the goals of burning are being met. These goals include: 1) fuel load reduction which, if left to accumulate, might cause a destructive wildfire, 2) exposure of bare mineral soil which has allowed for the successful germination of herbaceous vegetation and pine seeds, and 3) reduction of invading hardwood trees.
















The burn program will be expanded into selected areas of the western portion of the park. These areas will be selected based on the condition of the plant community and the probability that the community can be restored successfully. These areas include sites with wiregrass growth, the presence of longleaf pines, and other open upland areas with a fair stocking of herbaceous vegetation. These types of sites are more likely to carry a fire through the zone and respond to the effects of burning. The western park addition will be surveyed to determine where the best burn sites are located.

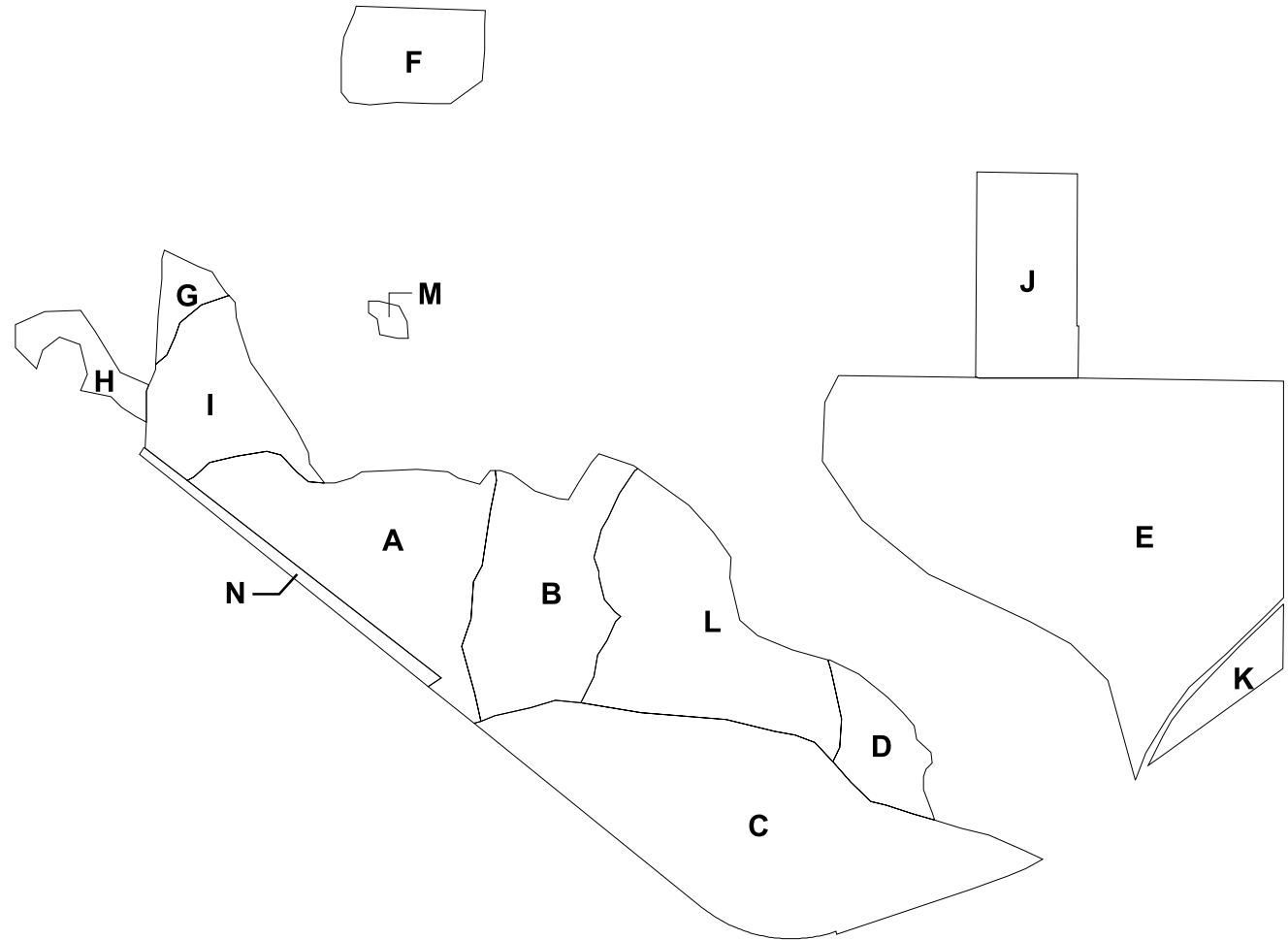
All burn zones have been reviewed for existence of cultural resources. Burn zones that have cultural resources are then evaluated for degree of threat that burning has to the integrity of the resource. If there is a threat, then methods for lessening or eliminating the threat are accounted for in the burn plan for that zone. Interpretation of prescribed burning has helped park visitors and neighbors understand the principles and use of this resource management tool.

Prescribed burning for Edward Ball Wakulla Springs State Park (by year) are as follows:

1. 1986: The state purchases the park. No recorded prescribed burning has ever been conducted on the property. No burning is done this year.
2. 1987: On December 6 test plots are selected and prepared for burning. No burning is done this year.
3. 1988: All six test plots are burned on March 1 and evaluated on March 31. The recommendation is made to expand the burning in all six plots. A total of 12 acres are burned.
4. 1989: Three burns are conducted and the first spring burn is done at Wakulla. A total of 178 acres are burned.
5. 1990: Four burns are conducted two of which are the first repeat burns done at Wakulla. The first summer burn is conducted. A total of 100 acres are burned.
6. 1991: Three burns are conducted and a new Burn Zone is added. A total of 77 acres are burned.

LEGEND

	A-140.29 ac.
	B-110.21 ac.
	C-254.97 ac.
	D-35.55 ac.
	E-426.36 ac.
	F-49.00 ac.
	G-13.75 ac.
	H-20.04 ac.
	I-66.97 ac.
	J-79.05 ac.
	K-22.00 ac.
	L-142.24 ac.
	M-3.89 ac.
	N-16.39 ac.
	Edward Ball Wakulla Springs State Park



1000 0 1000 2000 Feet

Florida Department of Environmental Protection
Division of Recreation and Parks
Office of Park Planning

**EDWARD BALL WAKULLA SPRINGS
STATE PARK**

BURN ZONE MAP

7. 1992: Six burns are conducted and three new Burn Zones are added. A total of 466 acres are burned
8. 1993: Five burns are conducted. Burn evaluation of burn done April 30, observes wiregrass flowering in Burn Zone D. First time recorded for the State Park. "Hot" burn on part of Burn Zone B and bark beetle attack on 7 acres. A total of 331 acres are burned.
9. 1994: Five burns are conducted. Two new Burn Zones are added. A total of 204 acres are burned.
10. 1995: Eight burns are conducted. A new Burn Zone is added. A total of 458 acres are burned.
11. 1996: Seven burns are conducted. Two new Burn Zones are added. A total of 173 acres are burned.
12. 1997: Eight burns are completed. A total of 489 acres are burned.
13. 1998: Seven burns are conducted. Severe spring/summer drought occurs. A total of three inches of rain in 3 months. Drought index hits 771 on June 24. Four wildfires occur on the park. Bark beetle infestation of Burn Zone K's longleaf pine covering 5 acres occurs. A total of 254 acres are burned.
14. 1999: Six burns are conducted. A new record of 639 acres is burned. Two new fire engines are purchased for future prescribed burning.

Designated Species Protection

The welfare of designated species is an important concern of the Division. In many cases, these species will benefit most from proper management of their natural communities. At times, however, additional management measures are needed because of the poor condition of some communities, or because of unusual circumstances which aggravate the particular problems of a species.

Three designated species appear to have benefited from the expanding prescribed fire program conducted by park staff. The populations of gopher tortoises in Burn Zones A, E, H and J have increased since the first burns were conducted. Gopher tortoise burrow surveys conducted after each burn in these zones has shown an increase in burrows and the addition of small burrows. The small burrows are an indication of successful recruitment occurring in these areas. Observations of the Sherman's fox squirrel have been noted from several different areas. Prior to the initiation of the Wakulla Springs burn program, observations of the fox squirrels were noted only from a small area of the park situated in the northwest corner of Burn Zones A and I. In the last five years, the fox squirrels have been seen in all portions of Burn Zones A and I, as well as in Burn Zones B, C, and L. Fox squirrels have even been seen on the River Road. For the first time ever, fox squirrels were observed in the park on the north side of the Wakulla River, when they were twice seen in Burn Zone E. Another turtle that appears to have benefited from burning is the Suwannee cooter. The cooter is the most common turtle seen on the Wakulla River. Dr. Dale Jackson, during his five-year research study of the Suwannee cooter, noted the turtle nested mostly in disturbed areas such as the River Road, the meadow area, and the warehouse area. Because of this nesting pattern, predation by raccoons and crows is extremely high for these areas. After Burn Zone B was burned, Suwannee cooter nesting was observed in the newly open areas of the burn zone. Also, after Burn Zone L was burned, nesting was observed there. To nest in Burn Zones B and L, the turtles had to crossover River Road.

There is one active Bald eagle's nest located within the park. The nest is located in a large cypress tree on the north bank of the Wakulla River located about two miles down river from the spring. The nest has been active for the last 8 years and has been very successful producing at least one chick each year. The nest is monitored in cooperation with the

Florida Fish and Wildlife Conservation Commission. The Commission flies aerial surveys of the nest yearly checking for eggs and fledglings. Park staff monitors the nest during the late fall and winter. The nest is monitored from a land observation point so that nesting activity is not disturbed. Activity near the nest is restricted during the nesting period.

Several of the listed species are birds that are associated with the Wakulla River. These include Limpkins, Little blue herons, Snowy egret, Tricolor heron, White ibis, Yellow crowned night heron, and Black crowned night heron. These bird species are monitored by park staff conducting monthly river tour surveys, daily boat tour observations, Christmas bird counts, and by a survey of the entire Wakulla River done twice each year. Population counts, nesting sites and activity, and locations of birds are noted with this monitoring.

Manatees were observed at Wakulla Spring for the first time ever in early August of 1997 when a group of four made their way up the river to the spring. The manatees stayed for three days before heading back down river and out of the park. In 1998, manatees were observed in the lower portion of the park waters but did not come up to the springs or into the tour boat section of the river. A single, young male manatee was observed in the spring basin, swimming area, and upper portion of the Wakulla River for 4 days in December of 2000. Manatees are regularly observed in the Wakulla River below the park boundary. When manatees are in park waters, all Federal and State regulations concerning their protection are followed and enforced. Boat tour drivers are made aware of the manatee's presence and advised to slow and stay clear of the mammals. Lifeguards at the swimming area are instructed to keep swimmers out of the water area near the manatees when they are present.

The troglodytic faunas of the aquatic caves are also of concern to park staff. The blind crayfish are vulnerable to overcollecting. Since the 1987 dive project, no specimen collections of any troglodytic fauna have been authorized. Park staff will give careful consideration and review to any future proposals of collection.

Exotic Species Control

Exotic species are those plants or animals that are not native to Florida, but were introduced as a result of human-related activities. Exotics have fewer natural enemies and may have a higher survival rate than do native species, as well. They may also harbor diseases or parasites that significantly affect non-resistant native species. Therefore, the policy of the Division is to remove exotic species from native natural communities.

The hydrilla's presence in the Wakulla River and spring is the most threatening exotic plant at the park. The impact of this plant to the park has been so dramatic and widespread, that it requires special consideration. Unfortunately, the swift-flowing nature of the river and the extent of hydrilla's invasion will make control a long term, costly process. Hydrilla has the potential for causing serious, permanent deterioration of the system. No one knows exactly how this exotic was introduced. Hydrilla was first observed in the spring run area in April of 1997. It has increased at an alarming rate, outcompeting and displacing large amounts of eelgrass and other submerged vegetation in the upper first mile of the river and spring. A hydrilla management plan has been implemented and a copy is on file at the park. The plan will require frequent updates and revisions, as research will possibly lead to additional methods of control. Assistance dealing with the hydrilla infestation will be sought from additional sources.

A substantial attack of removal on a second aquatic exotic, parrot's feather has been enacted over the last six years. This exotic has been eradicated from the west end of the swimming area. Parrot's feather is present along the shores of the meadow area and has spread down river despite several control efforts by park staff. The amount of infestation

has been reduced but the range has increased. One other area, a small portion of the southern shoreline just down river from the boat dock, has recently been discovered and treated. Several more treatments will be needed in both these remaining areas to achieve control of the parrot's feather.

Brazilian elodea is present in great amounts on portions of the river and at Sally Ward Spring and its creek run. The elodea has been removed in small amounts and its impacts to the park resources have been greatly over shadowed by the infestation of hydrilla. Elodea has been displaced by hydrilla in the upper portions of the Wakulla River, but still infest large portions of the middle section of the river. Impacts from elodea have been much less severe than those presented by hydrilla.

Upland exotic plants at Edward Ball Wakulla Springs State Park are present but their impacts are minor and are dealt with on a routine basis. When exotic plants are observed they are removed and treated. The site is monitored for reinfestation and additional treatment is applied if necessary.

Exotic animals at the park are not a major concern. The biggest problems are feral cats and dogs that are dropped off at the park, and stray hunting dogs. The hunting dogs are usually caught and, if they can be identified, their owner is contacted to retrieve the animal. Dogs, whose owner cannot be identified, are held and then turned over to the Wakulla County Animal Control. Cats are taken to Wakulla County Animal Control or given to private individuals. Park staff ownership of free ranging cats is not allowed.

Problem Species

Problem species are defined as native species whose habits create specific management problems or concerns. Occasionally, problem species are also a designated species, such as alligators. The Division will consult and coordinate with appropriate federal, state and local agencies for management of designated species that are considered a threat or problem.

Problem species at Edward Ball Wakulla Springs State Park are limited to alligators, Eastern diamondback rattlesnake, raccoons, crows and vultures. Alligators near the park's swimming area are a constant concern. Smaller gators, 4-7 feet long, are pushed out of their natural areas by larger gators. These smaller gators often try to move into the areas surrounding the swimming area. When park staff files an alligator report, the park biologist does an alligator assessment on the offending gator. Based on the results of the assessment, actions are recommended. The recommended action ranges from continue to monitor and record the actions of the alligator to removal of the alligator. When removal is recommended, park staff contacts the Florida Fish and Wildlife Conservation Commission. The Commission gives authorization for the gator removal and contacts an approved, contracted alligator trapper. The trapper, with assistance from park staff, locates and removes the problem gator. It is not unusual to have several alligators removed from the park in a one-year period. Other years no alligators require removal. Sometimes alligators are encountered on the nature trails of the park. These gators are chased away from the trails by park staff. Interpretive signs on alligators are posted at the swimming area and along the nature trails. The Eastern diamondback rattlesnake is sometimes encountered on the nature trails and on the lodge grounds. When encountered and park staff is made aware of the snake's presence, the snake is removed and placed in a natural, non-use area of the park.

Raccoons and crows are a concern because of their highly efficient predation of turtle nests. Suwannee cooters nest in and along the 3-mile long River Road during the late spring and early summer. Dr. Dale Jackson in his 5-year study of this turtle (Jackson 1997)

determined that predication by the crows and raccoons accounted for a 99 percent loss of eggs, which is a concern to park staff. Turtle populations are measured in all wildlife surveys that are done on the river environment. There has been no detection of a decrease in the Suwannee cooter population. When Suwannee cooters are observed nesting on the lodge grounds, the nests are sometimes screened for protection from crows and raccoons. These screened, protected nests are then interpreted to the visitors through signage that is placed at the screen. Vultures are nuisances during the winter months. Their destruction of park property at the waterfront and on the boats can be costly and frustrating. Their natural wastes are smelly and unsightly. Park staff has attempted several control measures to keep the vultures away from these areas. Most have met with failure. Park staff will continue to explore ways to reduce the impacts from these annoying birds.

Infestations of pine bark beetles have been a problem. When infested trees are located in use areas such as the picnic grounds, the resulting dead snags can be a safety hazard. When beetle killed trees are deemed a safety hazard, the snags are dropped and removed from the site. Other pine trees surrounding the infested site are examined for beetle signs and are sometimes treated with an approved insecticide to prevent further beetle infestation. When bark beetle attacks occur in natural areas, the site is monitored. If the infestation is minor, no action is taken and the infestation is allowed to run its natural course, usually taking out only a few stressed trees. If the beetle infestation is large enough that a timber harvesting operation can be justified, the site and the impacts of harvesting are reviewed. If the review determines harvesting is practical then the infested trees may be harvested.

Management Measures for Cultural Resources

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. Approval from Department of State, Division of Historical Resources (DHR) must be obtained before taking any actions, such as development or site improvements, that could affect or disturb the cultural resources on state lands. A statement of DHR's policies and procedures for the management and protection of cultural resources is contained in Addendum 9.

Actions that require permits or approval from DHR include development, site excavations or surveys, disturbances of sites or structures, disturbances of the substrate, and any other actions that may affect the integrity of the cultural resources. These actions could damage evidence that would someday be useful to researchers attempting to interpret the past.

Management of cultural resources at the park will be accomplished according to cyclical schedules developed for each zone. The structures of the lodge complex zone will be managed in the manner of an adaptive reuse of historic structures. The period considered appropriate for restoration or replication planning will be 1938-1942, unless a specific structure is of a later construction. No false or thematic "restoration" of any structure will be attempted. In all other ways, management of the visible resources of this area should proceed as though they were the building stock, roadways and landscaping of any Florida State park.

Appropriate cyclical management schedules for each element of the structural cultural resources of the lodge complex should be developed and implemented. Schedules should be periodically reviewed and updated in conjunction with the BNCR Historic Preservationist and District 1 staff.

Architectural features and fabrics that no longer exist but whose restoration or replication would contribute to aesthetic appreciation of the lodge complex should be identified. Restoration or replication may be considered when cyclical replacement of more recent

substitutes is appropriate. Windows in upstairs portion of the lodge have been restored and one window was replaced with a modern substitute that is in keeping with the overall design of the lodge structure. In the case of the roof fabric, plans for restoration are underway.

Appropriate materials and techniques for each element of the interior spaces of the lodge complex should be developed and implemented. Materials and techniques utilized in performing routine maintenance functions should be periodically reviewed and updated in conjunction with the BNCR Historic Preservationist and District 1 staff to ensure appropriateness of chemical compounds, materials used to apply and remove such compounds, and reversibility of processes performed.

Because of the likelihood for prehistoric sites near the park, park and District staff should routinely visit known sites in the undeveloped area of the park to protect sites and potential sites from vandalism. Monitoring sites using photopoints is encouraged. Reports of activities should be filed at both the park and District offices.

Woody vegetation in archaeological sites should be managed according to DRP guidelines. Native herbaceous ground cover, such as spikegrass (*Chasmanthium sp.*) should be established/encouraged on mounds to limit possibilities for erosion.

Any new plans for prescribed burning should be reviewed for impacts to cultural resources before their implementation. Park staff should continue raking around cat-faced pines that are near firelines.

Ground-disturbing activities will be conducted in accordance with the Department of State, Division of Historical Resources (DHR) policy.

Vandalism should be discouraged using interpretive signage near the lodge complex that includes warnings against collecting artifacts in both terrestrial and aquatic environments.

Submerged cultural resources require special management. Any use of the spring other than recreational swimming and boat tours will be guided by the existence of cultural and paleontological resources contained therein. Questions concerning the protection of these resources and associated artifacts as well as planning for changes in activity patterns in the spring area should be directed to staff of the DHR as well as the Division Bureau of Natural and Cultural Resources.

Known cultural resources in the undeveloped area will remain unidentified to the public until and unless current limitations on public access to the area are altered. Should such changes occur, management routines should be altered to adapt to changed circumstances.

Research Needs

Natural Resources

Any research or other activity that involves the collection of plant or animal species on park property requires a collecting permit from the Department of Environmental Protection. Additional permits from the Florida Fish and Wildlife Conservation Commission, the Department of Agriculture and Consumer Services, or the U.S. Fish and Wildlife Service may also be required.

Research on the growth, impact and control of the exotic plant hydrilla is a primary need. Assistance from other agencies with this subject will continue to be pursued by park staff. Additional controls, including all biological, herbicidal, and mechanical methods need to be reviewed and evaluated for use at Wakulla Springs. Impacts of removal and restoration of lost native aquatic plants should also be researched.

Additional collection of water quality and flow statistics on the spring and river are still a need. Assistance from the U.S. Geological Survey, Northwest Florida Water Management District, Florida Department of Environmental Protection, and approved cave diving groups will continued to be pursued. In addition, continued exploration and mapping of the karst system of Wakulla Springs will be allowed. The exploration and mapping of the karst system will now include features found on the western portion of the park. This will include Cherokee Sink and the other wetland areas located within these properties.

Biota inventories are a continuing need of the park. Specific needs are to continue to expand lists of plant and animals occurring at the park. The new park additions have had only minimal biota observations done as secondary objectives. A survey of the biota found on these new properties is needed. Mapping and monitoring of listed species are a top priority of this research need. Most research allowed in the park requires the researchers to provide a list of all plant and animals encountered during their research activity.

Natural and artificial germination of native upland plant species is a research need for the restoration of the upland pine areas of the park. Determination and location of successful species and sites are a primary goal for this research need.

Research into the historical land use of the upland areas of the western portion of the park are a need to help assist in the possible restoration of some of the plant communities. If the impacts of prior land use can be determined, then the need for restoration can be addressed.

Cultural Resources

A phase I archaeological survey is needed for the western portion of the park. Of primary concern is the historical use of Cherokee Sink. Also, there is the rumored use of the area just south of Cherokee Sink as a 1900s cemetery. The presence of such a cemetery needs to be verified or disproved as part of the management plan for the Cherokee Sink area.

Stephen Bryne conducted a Phase I survey in 1988 (a Phase I survey focuses on evaluating known resources, locating new resources, and making some general statements about significance and recommendations for management). No independent cultural resources survey of the lodge zone is planned. However, if the area is subjected to further development, a Phase II survey would be called for (Phase II surveys involve limited excavation and usually focus on refining information about a site or group of sites).

Local oral tradition holds that a community of African Americans living in the area earned money by rowing tourists across the spring. Travel literature places African American boatmen at the spring (Long 1883), but physical evidence concerning this population is limited to the remains of Wa326. Additional evidence is likely to exist in the area but would require a more intensive survey than Bryne's 1988 survey. Thus, a Phase II archaeological survey and/or a folklife-based historical study are recommended.

Knowledge about African Americans as well as others who worked the turpentine and naval stores industries during the late nineteenth and early twentieth centuries is limited to evidence provided by cat-faced pine trees. Historical research is needed to document the activities of these communities.

Research about the structures of the lodge complex is ongoing, and the efforts of outside researchers are welcomed as long as their efforts do not threaten the physical integrity of the resources.

When individuals with historical knowledge of Wakulla Springs are encountered, their name, address and telephone number will be obtained. Efforts will be made by park staff to conduct an oral interview of such individuals to record their experiences.

Resource Management Schedule

A priority schedule for conducting all management activities which is based on the purposes for which these lands were acquired, and to enhance the resource values, is contained in Addendum 10. Cost estimates for conducting priority management activities are based on the most cost effective methods and recommendations currently available (see Addendum 10).

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 of the Internal Improvement Trust Fund (board) are being managed for the purposes for which they were acquired and in accordance with a land management plan adopted pursuant to s. 259.032, the board of trustees, acting through the Department of Environmental Protection (department). The managing agency shall consider the findings and recommendations of the land management review team in finalizing the required 5-year update of its management plan.

Edward Ball Edward Ball Wakulla Springs State Park was subject to a land management review on October 19, 1999. The review team made the following determinations:

1. The land is being managed for the purpose for which it was acquired.
2. The actual management practices, including public access, were in compliance with the management plan for this site.

The land management review team report, including the Division response to that report, is contained in Addendum 11.

LAND USE COMPONENT

INTRODUCTION

Land use planning and park development decisions for the state park system are based on the dual responsibilities of the Division of Recreation and Parks. 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, 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, through public workshops, and environmental groups. With this approach, the DRP's 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 described and located 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, adjacent land uses, and the park interaction with other facilities.

The park is located in the Apalachee Planning District, which includes Calhoun, Franklin, Gadsden, Gulf, Jackson, Jefferson, Leon, Liberty and Wakulla Counties. The Apalachee District remains largely rural in character, and is reported by the 2000 Florida Statistical Abstract as the least populated of the state's 11 planning districts with a 1999 estimated population of 421,096. The region grew nearly 25 percent from 1990-999. Medium projections forecast additional growth of more than 19 percent by 2010. Leon is by far the most populous county, accounting for over 56 percent of the total population of the region, and Wakulla is the third fastest growing county in the state. The City of Tallahassee is the largest metropolitan area of the region with an estimated 1999 population of 143,237. The park is a short drive from the unincorporated areas of Woodville, Crawfordville and St. Marks. These communities continue to grow, fueled in large part by the Capitol city's expansion. Despite a relatively modest population size compared to other districts in the state, a strong projected growth rate, combined with proximity to a large, rapidly growing urban center will only serve to produce additional demand for recreation services.

Wakulla County maintains a high percentage of open space and conservation lands, with roughly sixty percent of the county in public ownership. The park is located in an area with a significant concentration of resource based recreation opportunities provided by surrounding public lands. The Apalachicola National Forest protects over a half million acres a short distance to the north. The 68,000 acres of the St. Marks National Wildlife are located just to the east. San Marcos de Apalache Historic State Park is situated a short

drive south at the confluence of the Wakulla and St. Marks Rivers. The closest recreation resource is the Tallahassee--St. Marks Historic Railroad Trail State Park, located within a couple miles of the park's eastern boundary. Nearly 300,000 users were recorded on this regional recreation resource during fiscal year 1999-2000.

Existing Use of Adjacent Lands

Privately owned lands adjacent to the park include a mix of undeveloped woodlands, open fields, pine plantations, and low-density single-family housing. Adjacent public lands include a 15-year old clear-cut parcel immediately north of State Road 267, which is managed by the State Division of Forestry.

Planned Use of Adjacent Lands

The Wakulla County Comprehensive Plan's Future Land Use Map designates nearly all adjacent lands as Agricultural. Agricultural lands primarily support timber and/or farming activities and allow for very low residential densities. Lands designated Rural Residential (R-1/R-2) are located along the eastern and southern boundaries off County Road 365. Rural land use designations provide for a range of agricultural, residential and limited commercial activities at low densities. There is currently no significant development planned adjacent to the park. However, as Wakulla County grows, and water and sewer services become more widely available, additional development of lands near the park can be expected.

Wakulla County has established a special planning area that includes the park, connecting surface water drainage and major groundwater conduits. The planning area is governed by land use restrictions regulating the use, handling, production, storage and disposal of toxic or hazardous substances. Proper enforcement of this ordinance will help avoid the future development of incompatible land uses adjacent to the park and serve to protect the water quality of Wakulla Springs.

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.

Recreation Resource Elements

This section assesses the unit's recreation resource elements those physical qualities that, either singly or in certain combinations, supports the various resource-based recreation activities. Breaking down the property into such elements provides a means for measuring the property's capability to support individual recreation activities. This process also analyzes the existing spatial factors that either favor or limit the provision of each activity.

Land Area

Recent acquisition has expanded the park to 4,718.15 acres, with 4,071.35 acres classified as uplands. Recreational uses and existing facilities are primarily located on roughly 60 acres south of the main spring, including the swimming area, boat docks, lodge and picnic area. The park contains a mix of floodplain swamp, upland pine forests, and hardwoods of exceptional quality on both sides of the river. Most human activity is excluded from a protected zone known as the "Sanctuary," that includes the Wakulla River, and its floodplain, and the uplands to the south (see Conceptual Land Use Plan). The remaining uplands north of the river offer a high quality aesthetic experience for recreational users.

The newly acquired area west of State Road 61 contains nearly 1,500 acres of highly

disturbed uplands that are suitable for the development of more intensive recreation facilities. This area has been degraded by land clearing and currently supports an abundance of hardwood thickets. It will take some time before the visual quality of the landscape is restored. This area presents an opportunity to relieve some of the pressure facing existing use areas and sensitive habitats in other portions of the park. This location should be given priority consideration when proposing the development of additional recreational facilities and uses before expanding into other areas of the park. However, it bears mentioning that the size of this area and its isolation from existing park facilities poses challenges to the development and management of recreation activities.

Water Area/Shoreline

The park contains roughly 130 acres of surface waters, including the first three miles of the Wakulla River. Wakulla Spring supports most of the recreational use of the park. Controlled access to the spring basin and river is provided by a designated swim area and boat tours. River and glass bottom tour boats give visitors an opportunity to view the natural resources of the park both above and below the water. Swimming, snorkeling and diving are prohibited directly over or within the spring vent. Personal watercraft, including canoes and kayaks, is prohibited on the river within the park boundary.

The only developed shoreline access is at the main spring area. The swimming area is approximately 1.5 acres and includes roughly 350 feet of shoreline. The remainder of the approximately 5.6 miles of park shoreline is largely inaccessible due to the floodplain swamp that borders it. The shoreline is accessible in a few places downriver but their geographic isolation and sensitivity of surrounding resources precludes developing additional use areas in these locations. Additional shoreline has been acquired on the northeast side of the river at the County Road 365 bridge and at Cherokee Sink, located on the new parcel west of State Road 61. Cherokee Sink has traditionally been used as a local gathering place and swimming hole.

Natural Scenery

The natural scenery at the park is outstanding. The park is one of the most scenic areas in Florida, having received a National Natural Landmark designation in 1967. The views of the river, both above and below the water, are extraordinary. A remnant of primeval, wild Florida is evident downriver of the main spring, and views into the depths of the basin are breathtaking. The woodlands along the river are exceptional although parts of the park were altered by past farming and logging activities. The cypress swamps and hardwood forests of the park contain many large trees that provide a beautiful, shaded canopy along the shared-use trail system north of the river. Variety in the natural landscape is an important element of the natural scenery of the park.

Significant Wildlife Habitat

The park provides important habitat for a variety of wildlife, including a number of designated species. The Sanctuary of the park provides recreational value by contributing to species abundance and diversity that increases opportunities for visitors to encounter wildlife in public access areas. This protected area supports bird rookeries, a roosting colony of bats and a successful eagle's nest.

Ample opportunities exist for the visitor to encounter park wildlife. The trail system north of the river provides access to uplands that support populations of gopher tortoises and Sherman's fox squirrels. The boat tours introduce visitors to the aquatic wildlife, including alligators, turtles, fish and a variety of wading and diving birds. Manatees venture into the park on occasion and have been spotted at the spring basin.

Natural Features

The park's springs and sinkholes are the primary natural features of significance. The most important of these features is Wakulla Spring--one of the world's largest and deepest fresh water springs. The spring basin is the focus of recreation at the park, and provides an idyllic setting for the lodge. The Wakulla River flows to the southeast and is a refuge for a plethora of wildlife that enhances the popularity of the wilderness boat tours of the park. A secondary spring to the northwest, Sally Ward Spring, is connected to the main basin by a short creek run and provides an additional opportunity for visitors to view a natural spring run. Cherokee Sink offers additional water-based recreation opportunities. In addition to the unique karst features of the park, numerous old growth trees, including centuries old bald cypress and state champion size beech and magnolias, create a lasting impression on park visitors.

Archaeological and Historical Features

Humans have found Wakulla Spring a favorable place to gather for thousands of years. Seventy-two cultural sites have been identified within the park spanning at least as far back as 8,000 BC. These resources present unique opportunities to interpret the cultural history of the region. While the park uses some of these resources for interpretation, many opportunities exist to expand this type of programming.

The Wakulla Springs Archaeological and Historic District was placed on the National Register of Historic Places in 1993 and includes all property and facilities within the boundary of the park. The lodge and restaurant has been in operation since 1937. These facilities have changed little over the years, offering simple, old-fashioned foods, accommodation and hospitality. The lodge's white stucco walls, arches and tile roof is indicative of the Mediterranean Revival style of architecture that was commonly used during this period. Two additional structures are architecturally consistent with the lodge. The building currently housing the park administrative offices was originally constructed as a bunkhouse with dormitory-style accommodation for lodge guests. A third structure housed a power plant and maintenance center that provided infrastructure support to the lodge. This building currently serves as a laundry facility. The natural beauty of the site is enhanced by these charming old structures, reminiscent of the quiet and serenity of a bygone era. The lodge complex and grounds provide an ideal setting to host conferences, meetings and special events.

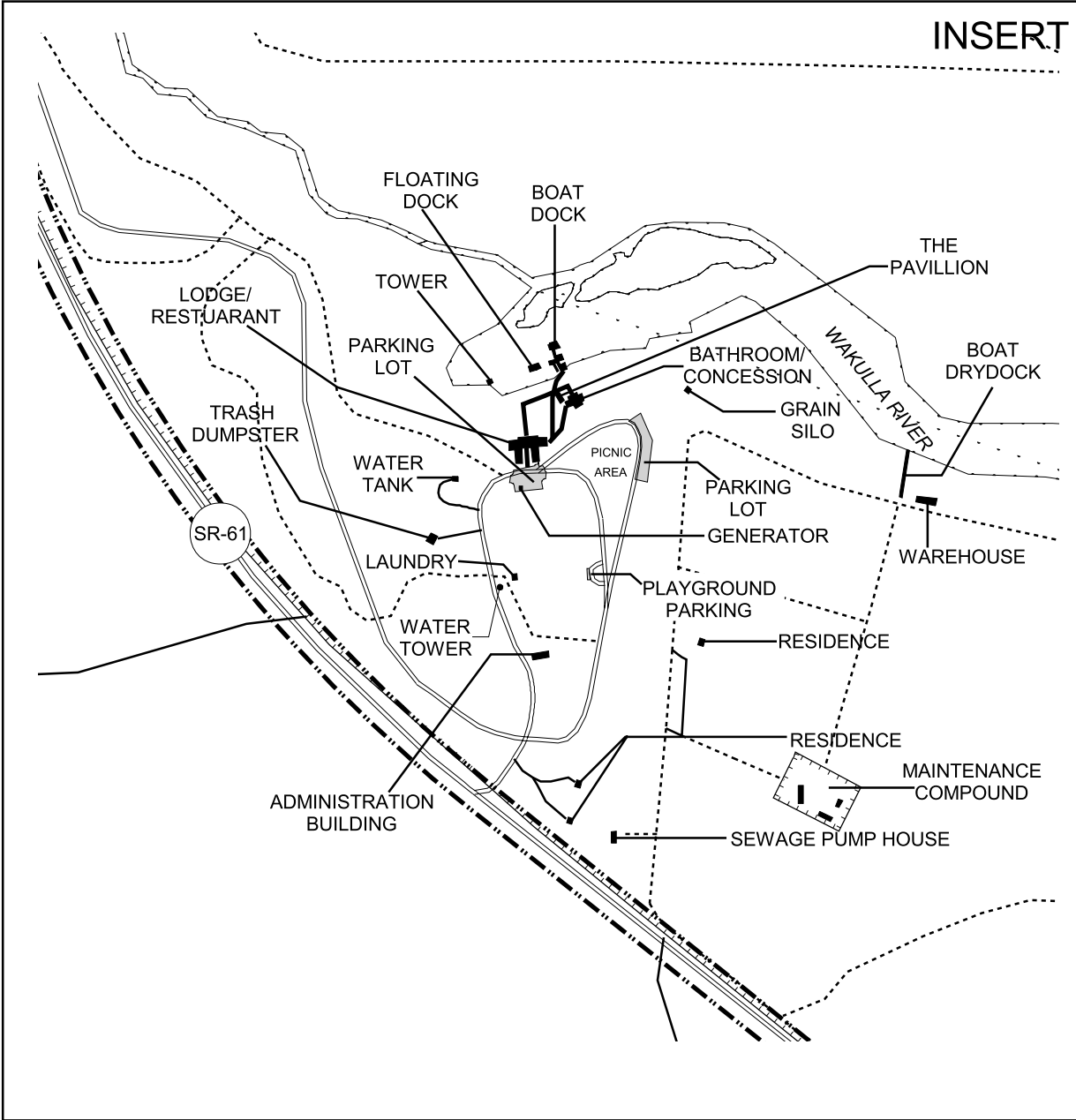
Assessment of Use

All legal boundaries, significant natural features, structures, facilities, roads, trails and easements 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.

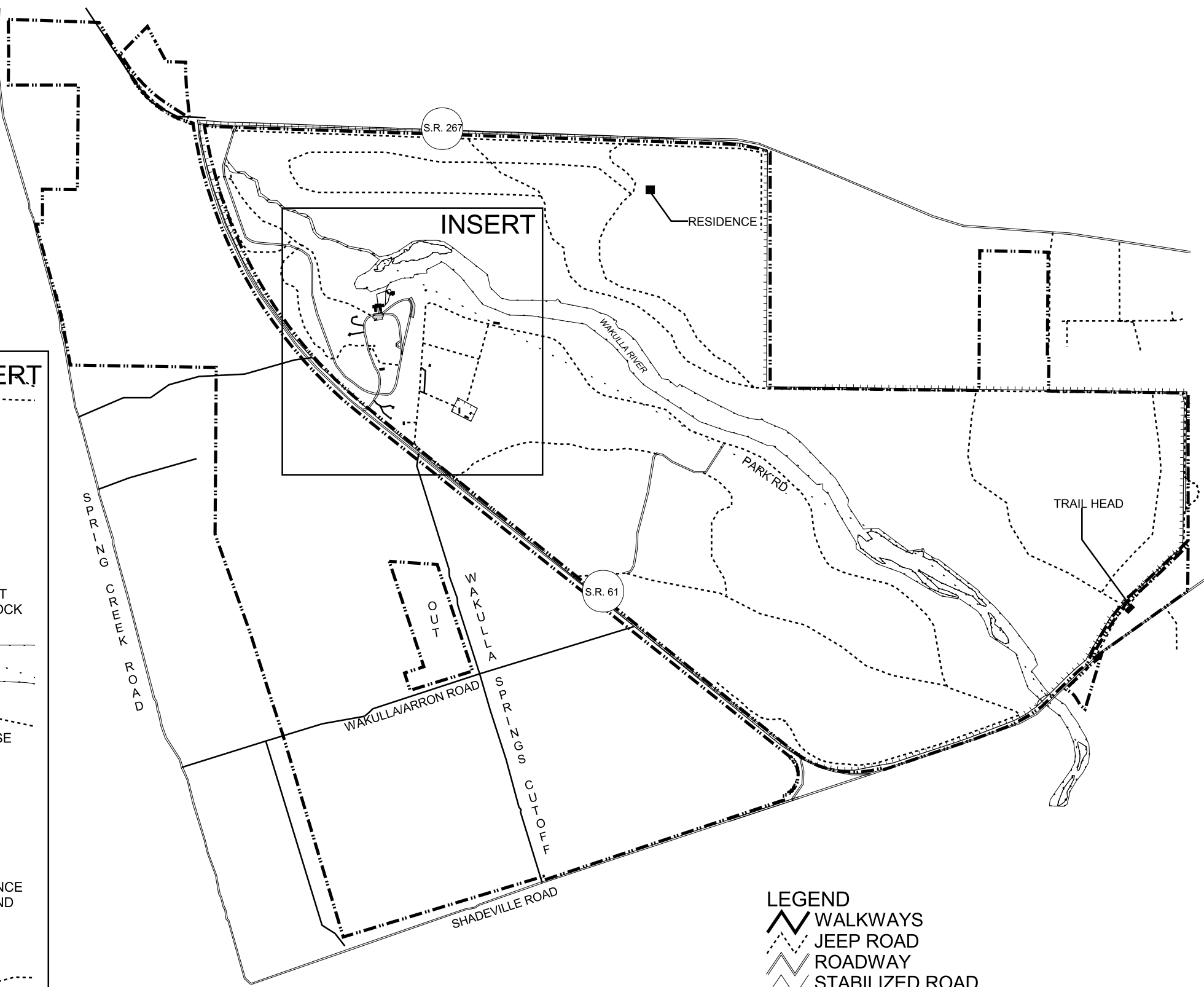
Past Uses

The Wakulla Springs area was used extensively by aboriginal inhabitants of the area. In more recent times, the park has been a lodge and resort, World War II training facility, movie filming location and tourist destination. A variety of uses has altered the landscape over time, including farming, logging and naval stores operations.

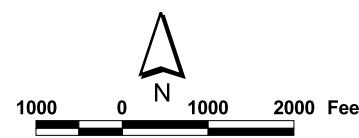
From 1937 until acquisition by the state, the spring basin was operated as a resort while the remainder of the land was preserved as a wildlife sanctuary. Recreation activities included guided boat tours, glass bottom boat rides, and swimming while the Wakulla Restaurant and Lodge provided food and accommodations. The woodlands were protected from hunting and fishing during this period and fire suppression contributed to successional changes in the forest communities. The river channel and Sally Ward Creek were modified in the late 1960s.



EDWARD BALL
WAKULLA SPRINGS STATE PARK



- LEGEND
- WALKWAYS
 - JEEP ROAD
 - ROADWAY
 - STABILIZED ROAD
 - FENCES
 - STRUCTURES
 - PARKING LOTS
 - PARK BOUNDARY



Florida Department of Environmental Protection
Division of Recreation and Parks
Office of Park Planning

BASE MAP

Newly acquired lands west of State Road 61 were extensively cleared before state ownership.

Recreational Uses

Current recreational uses at the park include boat tours, swimming, picnicking, hiking, off-road bicycle riding, horseback riding, and wildlife observation. The lodge complex includes accommodations, a restaurant, gift shop, and snack bar and supports conferences, meetings and special events.

Other Uses

Scientific research occurs on park grounds, much of which has been devoted to mapping the aquatic cave system. The resource management component provides additional details of these research activities. Data gathered as a result of this research will be used to improve management of park resources and environmental education activities.

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 Edward Ball Wakulla Springs State Park all natural communities have been designated as protected zones, excluding the upland mixed forest west of State Road 61 (see the Natural Communities Map). Future facilities with extensive resource impacts should be confined to those areas currently designated as ruderal, developed or, if additional land is required, the upland mixed forest.

The Sanctuary was in place before state ownership and should be maintained to buffer the river and protect the abundant wildlife for which the park is famous. Most human activity outside that necessary for park operations will continue to be restricted from those areas lying within the boundary of the Sanctuary. Requests for access into these areas, for research or related purposes, will be evaluated by park staff on a case by case basis.

Existing Facilities

The following is a brief discussion of existing park facilities. Facility improvement needs are discussed under Potential Uses and Proposed Facilities. See the Base Map for precise locations of existing facilities.

Waterfront and Lodge complex. The waterfront is a center of activity at the park. A marked swim area with a narrow sand beach, grass covered sunbathing area and floating dock supports water access adjacent to the main spring. A dive platform provides additional enjoyment of the spring waters. A small concrete retaining wall has been installed along the shoreline to address beach erosion. However, the swim area still requires occasional dredging to replenish the sand. A short chain link fence separates this area from the lodge grounds and provides a means for park staff to control access during off-hours. A boat dock supports the tour boats of the park, a concrete pier contains two binocular viewers and a modern brick structure serves as the boat tour ticket office. The ticket office and adjoining structures are architecturally inconsistent with the lodge.

Consistent with the historic presence of watercraft in the spring basin, the park offers riverboat and glass-bottom boat tours. The former provides superb wildlife viewing opportunities along the Wakulla River while the latter affords a glimpse of the

underwater world of the spring basin. These boats are a vital component of the recreation opportunities of the park and provide important natural and cultural history interpretation.

The lodge contains 27 guestrooms, three meeting rooms, restaurant, snack bar and gift shop. The lodge is generally in good repair, having recently undergone a renovation of the kitchen and guestrooms. The portion of the roof over the lodge terrace was replaced in 1999. Grant funding has been obtained to replace the entire roof to replicate the original construction. East of the lodge is a small gazebo, a bathhouse and concession. The bathhouse is in good condition having been renovated in 1995. The grounds between the lodge and the water are kept free from visual obstructions to maintain the view toward the spring. The Pavilion is a modern building located adjacent to the bathhouse that is used as additional meeting space.

Traffic circulation and parking areas at the lodge and waterfront entrance were recently reconfigured to provide more efficient and safer access. The lodge parking area was recently replaced with pervious concrete and now provides parking for 51 vehicles. Parking for day visitors was accommodated in a dirt lot between the picnic area and the waterfront entrance, within the picnic area itself and, at times, the lodge parking lot. Although this unregulated style of parking was popular with picnickers, it was unsafe for pedestrians, caused severe soil compaction around the existing large trees, and undermined staff's ability to regulate the carrying capacity of the park. Parking areas are now clearly separated and traffic signs direct lodge guests and day use visitors to the appropriate locations, with a portion of the loop drive designated for service vehicles only. The existing dirt lot between the picnic area and waterfront entrance will be closed and landscaped. A new parking area for day visitors has been built in a cleared grass lot east of the picnic area that accommodates up to 100 vehicles. A loading zone for buses and a separate drop-off area for picnickers are provided on road shoulders. Bus parking is provided in an adjacent location. An additional pervious parking area for up to 23 vehicles was constructed near the playground. Geoweb technology was utilized in constructing these parking areas to provide a pervious surface to facilitate stormwater management. This redesign will increase public safety by eliminating the potentially dangerous situation that exists when children exit the picnic area and run through a busy parking lot to enter the waterfront. It will also generate additional open green space for recreational activities and reduce soil compaction around the large trees located in the picnic area. The provision of marked, designated parking areas will also facilitate management of visitation on peak days.

Two structures that were original components of the lodge complex serve as administrative offices and a laundry facility. These structures are stable but will eventually require some restoration work. The administrative office building is well suited for conversion to dormitory style accommodations for visiting research groups or as an elder hostel if this becomes a need in the future.

Picnic area. A designated picnic area southeast of the lodge contains 100 tables scattered beneath a canopy of tall pines.

Trails. The Sally Ward Spring Nature Trail loops 2.5-mile westward from the lodge grounds and is limited to hiking only. A seven-mile double-loop, shared-use trail provides hiking, off-road bicycling and equestrian opportunities north of the river. The trailhead is located on River Road near the eastern boundary of the park and contains an honor box fee collection station with stabilized parking for up to ten vehicles with horse trailers.

Support facilities. A modern ranger station is located along the park drive with a small paved parking area. The park has three residences that include two mobile home trailers, one of, which is employee-owned. A boat maintenance building is located a short distance downriver from the main spring area. The park also contains various standard support structures for storage of equipment and workspace.

A water tower is located near the laundry building. This structure is anticipated to be a significant maintenance problem in the near future. It was recently inspected and no major problems revealed, but will require ongoing, costly maintenance. Talquin Electric was approached about assuming control of the tower, since it serves area residents in addition to park needs, but the utility provider was reluctant to assume responsibility. A need exists to formulate a strategy to deal with the long term water needs of the park and the resource requirements for maintaining a water tower on park grounds.

The following is a listing of existing recreation and support facilities:

- **Waterfront and Lodge Complex**

Swim area and beach (1.5 acres)
Dive platform
Boat dock
Tour boats
Concrete pier
Ticket office
Guestrooms (27)
Meeting rooms (3)
Snack bar
Pavilion meeting room (100-person capacity)
Restaurant
Gift shop

- **Waterfront and Lodge Complex**

Gazebo
Bathhouse
Concession
Laundry facility
Administrative offices
Paved lodge parking (51 paved spaces)

- **Picnic Area**

Scattered picnic tables (100)
Grills
Playground equipment
Unpaved parking (100 vehicles)
Unpaved parking (23 vehicles)
Trails

- **Sally Ward Spring Nature Trail (2.5 mi.)**

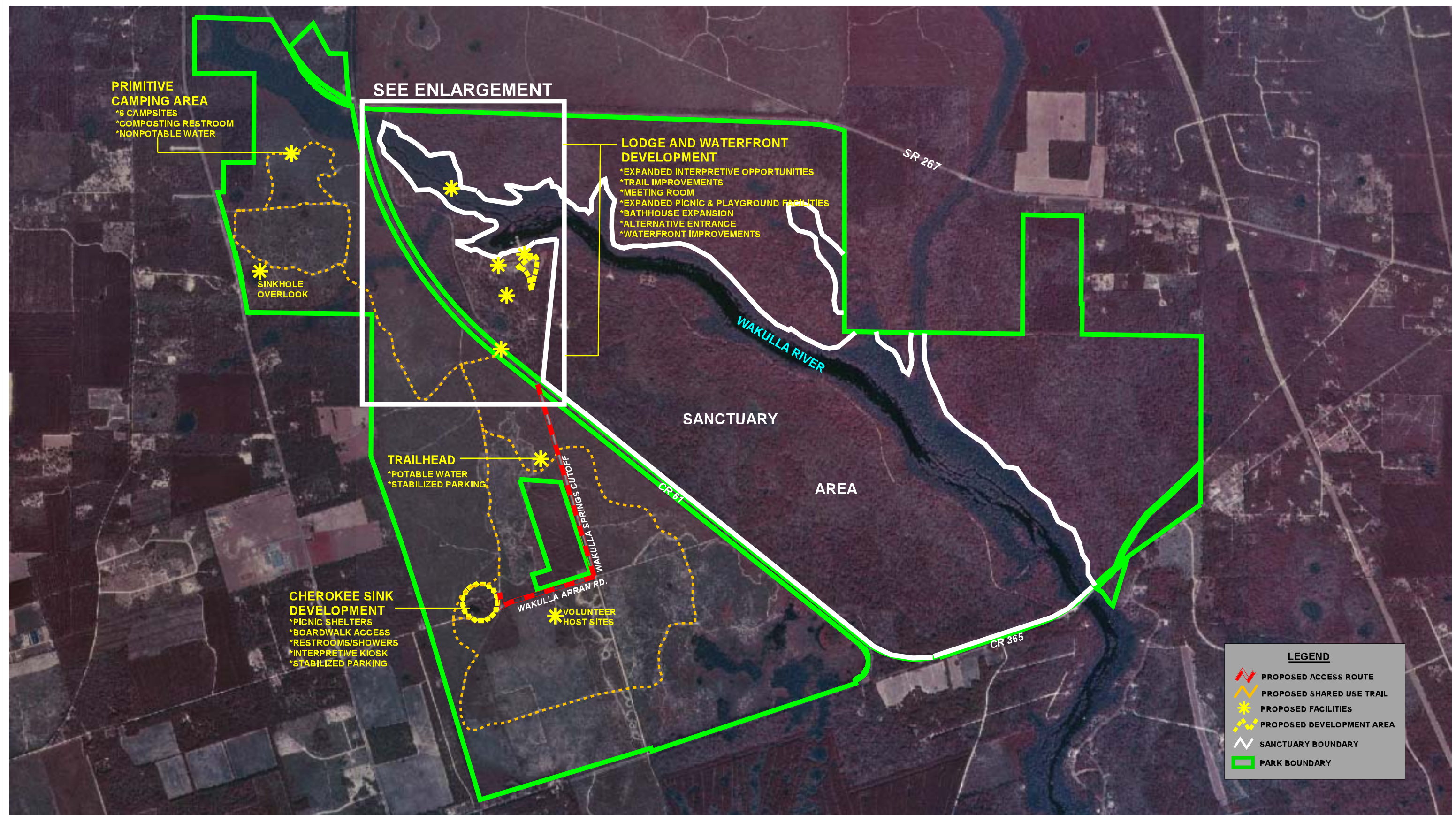
Shared-use trail (7.0 mi.)
Unpaved parking (10 oversized spaces)
Honor box fee collection station

- **Support Facilities**

Ranger Station
Ranger residences (3)
Boat maintenance building
Pump sheds (2)
Greenhouse
Utility buildings (3)
Shop building
Silo building used for storage
Equipment storage building
Flammable storage building
Water tower

CONCEPTUAL LAND USE PLAN

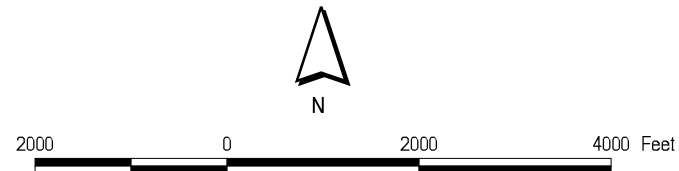
The following narrative represents the current conceptual land use proposal for this park. As new information is provided regarding the environment of the park, cultural resources, recreational use, and as new land is acquired, the conceptual land use plan may be amended to address the new conditions (see Conceptual Land Use Plan). A detailed development plan for the park and a site plan for specific facilities will be developed based on this conceptual land use plan, as funding becomes available.

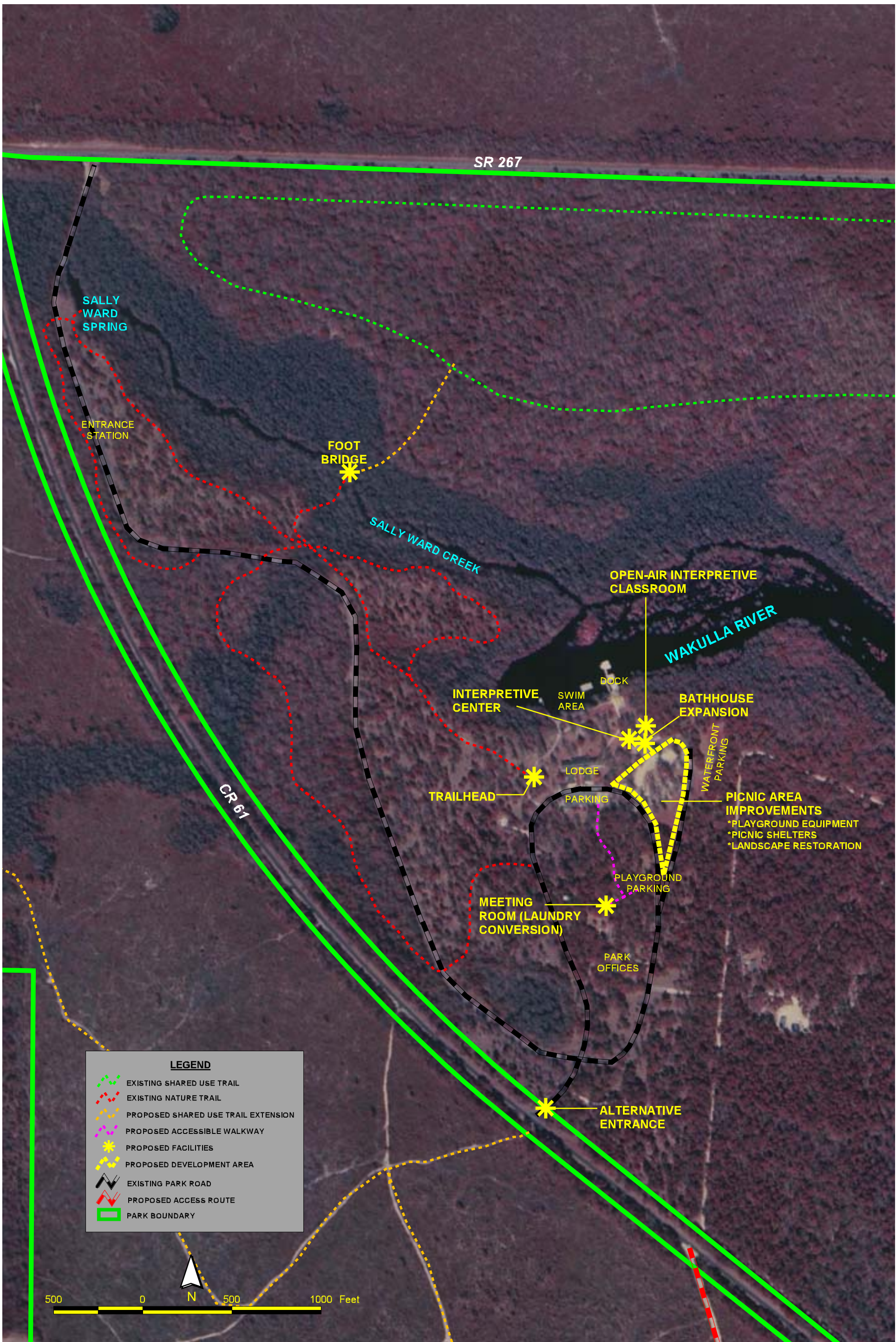


EDWARD BALL WAKULLA SPRINGS STATE PARK

CONCEPTUAL LAND USE PLAN

SHEET 1 OF 2





EDWARD BALL WAKULLA SPRINGS STATE PARK
CONCEPTUAL LAND USE PLAN
SHEET 2 OF 2 (ENLARGEMENT)

Florida Department of Environmental Protection
Division of Recreation and Parks
Office of Park Planning

During the development of the unit management plan, the DRP assesses potential impacts of proposed uses on the resources of the property. Uses that could result in unacceptable impacts are not included in the conceptual land use plan. Potential impacts are more thoroughly identified and assessed through the site planning process once funding is available for the development project.

At that stage, design elements, such as sewage disposal and stormwater management, and design constraints, such as designated species or cultural site locations, are more thoroughly investigated. Advanced wastewater treatment or best available technology systems are applied for on-site sewage disposal. Stormwater management systems are designed to minimize impervious surfaces to the greatest extent feasible, and all facilities are designed and constructed using best management practices to avoid impacts and to mitigate those that cannot be avoided. Federal, state and local permit and regulatory requirements are met by the final design of the projects. 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, the park staff monitors conditions to ensure that impacts remain within acceptable levels.

Potential Uses and Proposed Facilities

The current recreational uses at the park area appropriate and should continue. The recent acquisition of additional land presents opportunities to expand the trail system, provide additional swimming, and picnicking areas, and establish a primitive campsite. Existing picnicking and trail facilities are targeted for improvements and expansion. Proposed interpretive improvements include an interpretive center, outdoor classroom upgraded exhibits and generous use of interpretive signs and kiosks. Refer to the Conceptual Land Use Plan for locations of proposed facilities.

The Division is committed to expanding interpretation of Native American and African American cultural history at the park. Park staff will coordinate with local representatives of these groups to identify opportunities for additional interpretive programming. In addition to exhibit content, consideration should be given to scheduling live exhibits, demonstrations, speakers, and workshops focused on the cultural life ways of the area's historic and prehistoric inhabitants.

Waterfront and lodge complex. Proposed recreation improvements at the waterfront are focused on improving interpretation. Currently, interpretive information is limited to several displays within the boat tour ticket office. These exhibits will be modernized and expanded to present an updated, coherent educational message to park visitors. This location is important since it is a natural gathering point for visitors waiting for tour boat rides.

The internal configuration of the Pavilion is not conducive for the intended purpose of providing meeting space. It is recommended that the Pavilion be converted to an interpretive center. A climate-controlled environment is provided and the building currently meets ADA accessibility requirements. Another favorable feature is the wooden deck at the front of the building that would provide overflow and stacking space for school groups. This facility would provide additional educational opportunities to the approximately 16,000 students that annually visit the park. Importantly, its central location is ideal as it would be highly visible to visitors entering through the bathhouse and concession area and is a short walk from the swimming area, lodge and tour boat dock. It is recommended that the interpretive themes and media identified in the interpretive center conceptual design plan, prepared for the Friends of Wakulla Springs State Park, serve as a guide to the development of exhibits in this facility. Interpretive exhibits should cover a

broad range of issues and provide a comprehensive understanding of the natural and cultural features of the park. Visitors should walk away with a clear picture of the history, significant resources and recreational opportunities of the park. While this facility would serve as an orientation center for park visitors and provide the most thorough educational forum on park grounds, future consideration should be given to developing a more expansive facility that would better serve visitor education needs at the park.

An open-air interpretive classroom is recommended at the edge of the lodge lawn, between the bathhouse and ticket house, in a location that preserves the viewshed of the spring basin. This facility would provide much needed covered gathering space for individuals and groups awaiting tour boat rides and a location for staff to give interpretive talks to school children. The classroom should be designed to complement the architectural style of the park, include interpretive panels, and enough seating to accommodate a class of students.

In coordination with the Friends of Wakulla Springs, the park will be receiving a Partnership in Parks grant during fiscal year 2001/2002 aimed at improving waterfront facilities. Planned improvements include installing decorative fencing, providing shaded areas near the boat dock, changing the boat tour ticket house façade to better suite the existing architectural style of the park and upgrading interpretive exhibits. All improvements will be designed in a historically sensitive manner without creating a visual barrier between the lodge and spring basin.

The waterfront restrooms also need to be expanded. Increased restroom facilities for day users would decrease traffic within the lodge and help reduce wear and tear of lodge facilities.

In order to assist park staff with management of public access during peak visitation periods, an entrance for lodge guests is recommended where a paved section of park drive extends to County Road 61 approximately 1.5 miles south of County Road 267. A locked gate currently prevents public use of this route. A key pad operated gate is proposed so that lodge guests and those attending lodge functions or the restaurant could still enter the park when it is temporarily closed to day visitors once optimum carrying capacity has been reached. Directional signage at the main park entrance will be needed to facilitate traffic flow during times the park is closed to additional day use.

It is proposed that the laundry facility be renovated to provide a meeting room to offset the loss of meeting space due to the change in use of the Pavilion. This structure is scheduled to have the roof replaced and is considered structurally sound. The recently constructed playground parking area a short distance to the west would serve as the primary parking area. Overflow parking could be accommodated at the nearby administration building. A universally accessible path would connect these areas as well as the lodge, and a drop-off area and handicapped parking will be provided at the laundry building.

A new irrigation system is needed in order to maintain the aesthetics of the grounds. A well is suggested in proximity to the HVAC pump to provide water for heating and cooling the lodge as well as irrigating the lawns. Installation of a well would reduce water costs and eliminate noise pollution that exists with the current pump.

Picnic area. The picnic area currently lacks sheltered facilities. It is proposed that two large picnic pavilions be added in this area. These shelters would provide much needed covered space to eat and gather, particularly for the many large groups that use the area, and would generate sufficient revenue from reservation fees. An additional set of playground equipment is also recommended to increase play opportunities for the

thousands of children that visit the park. Consideration should be given to relocating the existing playground equipment in the future to provide a maintain a quiet setting around the conference facility.

Trails. A trailhead kiosk just west of the lodge is needed to provide trail information and orient users to the Sally Ward Spring Nature Trail. Additional interpretive signs are suggested to highlight significant features along the trail. A stabilized surface is recommended for approximately 2,500 feet of trail that would lead to a universally accessible footbridge near the midpoint of Sally Ward Creek. A bridged crossing will provide an important linkage between existing trail systems and add an interesting natural feature to the experience of all trail users irrespective of physical ability. It is recommended that the bridge be limited to pedestrian use.

Nearly 6.5 miles of shared use trails, accommodating hiking, off-road biking and horseback riding, are proposed for the new parcel west of State Road 61. The existing network of dirt roads should be utilized to the greatest extent possible. An overlook is suggested on one of the sinkholes along the northern loop as an added amenity for trail users. A trailhead with stabilized parking for up to 15 vehicles and potable water source are proposed just off Wakulla Springs Cutoff to support use of the trail and camping. An appropriate number of spaces should be allotted to accommodate vehicles with horse trailers. Future consideration will be given to connecting this trail system with the existing shared use trail north of the river. The potential also exists to connect with future trails on Division of Forestry land north of State Road 267 and the equestrian facilities at the YMCA camp to the west. Division staff will coordinate with adjacent land managers to encourage trail connections.

Responsible trail use will be actively promoted to avoid user conflicts developing on existing and proposed shared use trails. Park staff will monitor trail use and implement management measures, if necessary, to address problems adversely affecting the user experience. Actions may include increased education, trail re-routing or closure to different users. It is also recommended that all existing trails be evaluated for ease in navigation and directional signs and trail maps provided where necessary.

The Division will encourage the County to consider establishing bicycle lanes on CR 61 and Wakulla Springs Cutoff to provide a paved bicycle route to Cherokee Sink from the main use areas of the park. In the interim, a spur trail is recommended from the proposed alternative entrance to the proposed shared use trail for use by off road bicycles and pedestrians.

Primitive camping. A primitive camping area for up to 24 persons is proposed nearly two miles north of Cherokee Sink available for use by hikers and equestrians. Campers would park their vehicles at the proposed trailhead and hike or ride to their campsite. A portion of the campsites will be allocated to equestrian users and segregated from the tent sites. Recommended facilities include fire rings, hitching posts, composting restroom, and hand pump and watering trough for non-potable water only.

Cherokee sink area. Cherokee Sink has long been an important recreational resource for local citizens, primarily for swimming, but also for scuba diving. It is intended that these traditional uses be features maintained. With the availability of public access to local sinkholes and springs diminishing in recent years, maintaining access to these on public lands is increasingly important for public recreation. Diving would be managed by an honor system that requires display of a current certification card, similar to the system used at Peacock Springs State Park. Local divers report a lack of cave access in the sink, and

have indicated that Cherokee Sink has the potential to serve as a certification dive destination.

While the plan supports the traditional uses of swimming and diving, the area requires management measures to halt the further deterioration of this sensitive resource. The surrounding slopes are badly eroded due to uncontrolled access including vehicles driving up next to the sink. In the past, the surrounding area has been littered with cans and broken bottles and the sink is rumored to have served as a dumping ground for a variety of refuse. As noted in the Resource Management Component, a restoration plan will be developed to address bank stabilization and revegetation of eroding areas. All proposed facilities will be coordinated with this plan and designed and sited to enhance restoration. The restoration of Cherokee Sink presents a unique opportunity to encourage responsible resource use. An interpretive kiosk is recommended that discusses the restoration of the sink, and the link between the water quality of Wakulla Spring and the protection of the karst features of the area.

Two controlled access points are recommended on the north and east side of the sink, in areas that have traditionally been used to enter and exit the water. A system of boardwalks and platforms could safely control user access while minimizing impacts to the steep banks. These facilities should incorporate universal accessibility to the greatest extent feasible, be large enough to support small groups of users and provide some bench seating. Split rail fencing and adequate signage should be used to direct users between these areas, discourage the blazing of social trails around the sink and allow native vegetation to recover.

Additional facilities are recommended to be located a short distance north of the sink. Two small picnic shelters, scattered picnic tables and grills and a restroom are proposed within areas that have already been disturbed. Due to groundwater quality concerns, the provision of permanent restroom facilities is contingent on the future availability of central sewer in this area. Portable facilities or composting systems should be considered in the interim. Traffic will be routed along existing jeep trails north of the sink, terminating in a stabilized parking area for up to 30 vehicles. Appropriate buffers will be maintained between road and parking facilities and the sink to minimize water quality impacts from surface runoff.

The management of the parcel west of State Road 61 presents a challenge to existing park resources. It is proposed that up to four volunteer host sites be located in the vicinity of Cherokee Sink for use by volunteers recruited to assist with growing resource and recreation management needs at the park. These sites would be full facility campsites. Volunteers would contribute their time and energy assisting park staff in exchange for free use of the sites on an interim basis. The sites should be located off Wakulla Arran Road since this route is visible to sinkhole visitors and the proposed location for sewer line routing. If acquired, the nearby 40-acre out parcel would be the preferred location for these sites.

In order to manage public access on the new parcel, it is recommended that Wakulla County be approached to abandon portions of Wakulla Arran Road and Wakulla Springs Cutoff. Once abandoned, those sections not necessary to provide public access to Cherokee Sink would be closed. The County would retain control of the stretches of road necessary to provide access to the out parcel in the middle of the property. The section of Wakulla Arran Road west of Wakulla Springs Cutoff requires widening and grading to provide adequate public access to the Cherokee Sink area. An honor box fee collection station is recommended to collect fees from visitors to Cherokee Sink.

Support facilities. Wakulla County is pursuing grant funding to extend central sewer service to the area around the park. Future efforts should focus on connecting existing and proposed sewage collection and treatment facilities to the county system once the lines are available.

Two standard residences are recommended to upgrade existing mobile homes, and a four-bay equipment shelter is proposed to house park equipment. To meet the growing need for staff residences, existing homes within future acquisitions should be considered for additional park housing. The following is a listing of proposed recreation and support facilities at Edward Ball Wakulla Springs State Park:

- **Waterfront and Lodge Complex**

Interpretive Center
Open-air interpretive classroom
Waterfront facility improvements
Laundry conversion to meeting space (100-person capacity)
Universally accessible walkway
Bathhouse expansion
Irrigation system
Lodge entrance

- **Picnic Area**

Large picnic shelters (2)
Playground equipment

- **Sally Ward Spring Nature Trail**

Universally accessible trail (2,500 ft.)
Interpretive kiosk
Interpretive sign
Sally Ward Creek foot bridge

- **Cherokee Sink Trail**

Shared-use trail (6.5 miles)
Interpretive sign
Sinkhole overlook
Trailhead potable water

Trailhead stabilized parking (20 spaces)

- **Cherokee Sink Area**

Primitive Camping
Primitive campsites (24 person capacity)
Fire rings
Hitching posts
Composting restroom
Hand water pump (non-potable water)
Water trough
Boardwalk entry points (2)
Interpretive kiosk
Small picnic shelter (2)
Scattered picnic tables and grills (10)
Restroom
Cherokee Sink stabilized parking (30 spaces)
Split rail fencing (350 feet)
Volunteer host sites (4)
Road stabilization and widening
Honor box fee collection station

- **Support Facilities**

Four bay equipment shelter
Standard ranger residences (2)
Public sewer connections

Facilities Development

Preliminary cost estimates for the following list of proposed facilities are provided in Addendum 10. These cost estimates are based on the most cost-effective construction standards available at this time. The preliminary estimates are provided to assist the DRP in budgeting future park improvements, and may be revised as more information is collected through the planning and design processes.

Existing Use and Optimum 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 1).

The optimum 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 1.

Table 1 Existing Use and Optimum Carrying Capacity

Activity/Facility	Existing Capacity		Proposed Additional Capacity		Estimated Optimum Capacity	
	One Time	Daily	One Time	Daily	One Time	Daily
Wakulla Springs Unit						
Lodge guests/meeting space	187	187			187	187
Interpretive Center			35	140	35	140
Boat Tours	79	820			79	820
Swimming/Picnicking	511	1,022			511	1,022
Trails	95	380			95	380
Subtotal	872	2,409	35	140	907	2,549
Cherokee Sink Unit						
Swimming / Picnicking			106	212	106	212
Trails			65	130	66	132
Primitive Camping			24	24	24	24
Subtotals			195	366	195	366
TOTALS	872	2,409	230	506	1,102	2,915

The majority of visitors to Wakulla Springs spend their time at the waterfront. On peak days the numbers of visitors tax staff's ability to manage use areas, and detract from the overall recreational experience. Importantly, the numbers of visitors within primary use areas is stretching the resource's capacity to absorb user impacts. Consideration should be given to limiting access during peak periods to protect resources from degradation and preserve an enjoyable recreation experience for all visitors. The carrying capacities established in Table 1 should be used in conjunction with the park staff's professional judgement to guide these efforts.

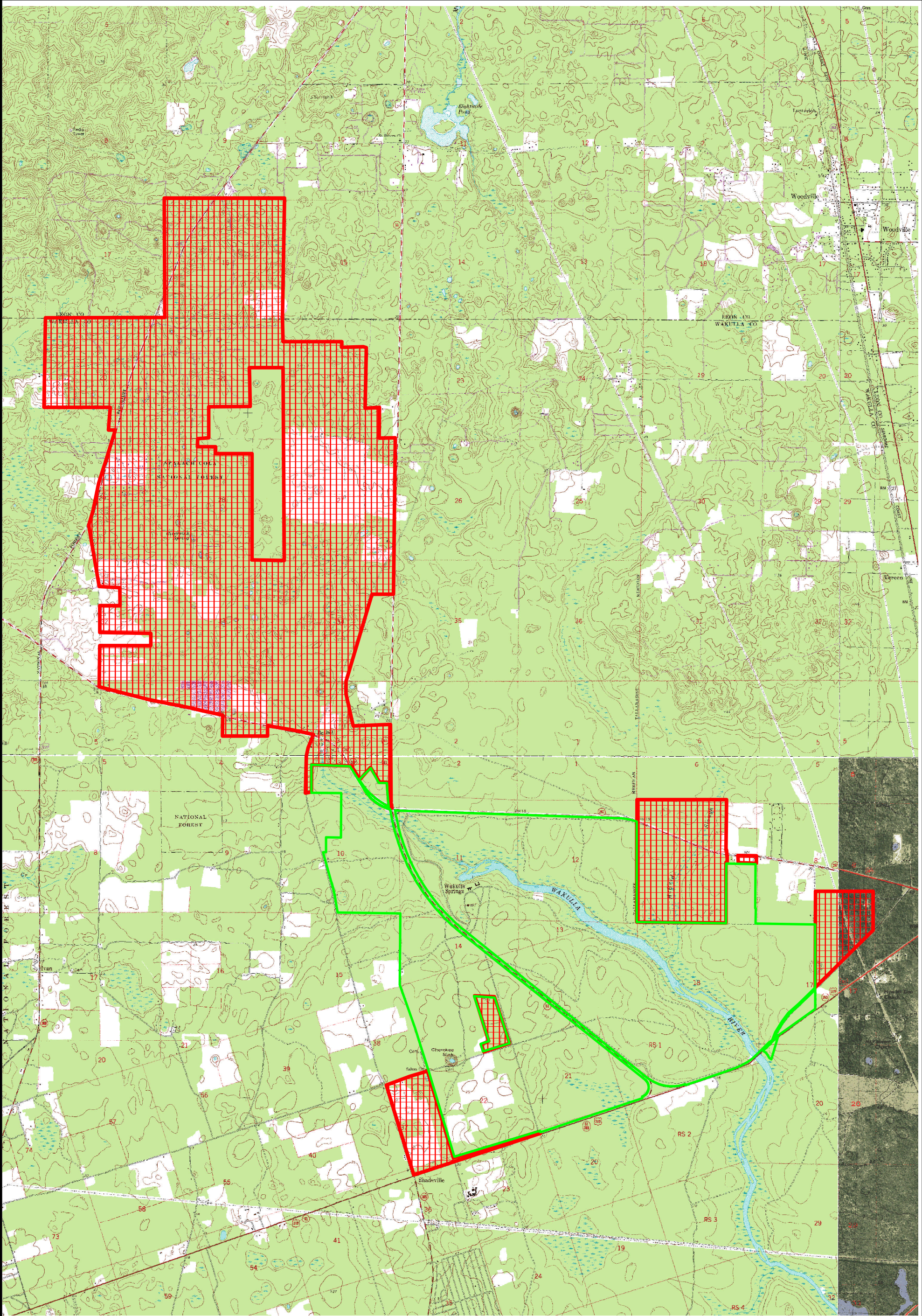
Optimum Boundary

As additional needs are identified through park use, development, research, and as adjacent land uses change on private properties, modification of the unit's optimum boundary may occur for the enhancement of natural and cultural resources, recreational values, and

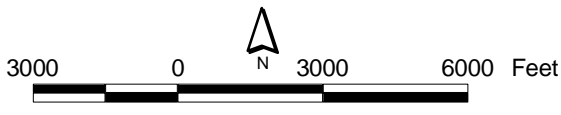
management efficiency. At this time, no lands are considered surplus to the needs of the park.

The optimum boundary map reflects lands identified as desirable for direct management by the DRP as part of Edward Ball Wakulla Springs State Park. These parcels may include public as well as privately owned lands that improve the continuity of existing park lands, provide additional natural and cultural resource protection, and/or allow for future expansion of recreational activities.

The majority of these lands are based on surface and subsurface hydrological features that are considered important for the long-term protection of Wakulla Springs. Lands identified northwest of the intersection of State Road 267 and State Road 61 would provide connectivity with the Apalachicola National Forest for the future development of recreational trails. Lands west of State Road 319 are identified on the map for water quality protection at Wakulla Springs due to the presence of known groundwater conduits. However, these lands may be better managed by the U. S. Forest Service (USFS) once acquired. The Division of Recreation and Parks would assume management of these properties only if no other manager were available. Finally, if optimum boundary lands east of State Road 319 are acquired, consideration should be given to the Division assuming management responsibility for adjacent USFS lands in this area.





EDWARD BALL WAKULLA SPRINGS STATE PARK



Prepared by:
Florida Department of Environmental Protection
Division of Recreation and Parks
Office of Park Planning

LEGEND

-  PARK BOUNDARY
-  OPTIMUM BOUNDARY

Addendum 1—Acquisition History

**Edward Ball Wakulla Springs State Park
Acquisition History**

Purpose and Sequence of Acquisition

The State of Florida has acquired Edward Ball Wakulla Springs State Park to develop and manage the property for public outdoor recreation and related purposes.

On September 17, 1986, the Board of Trustees of the Internal Improvement Trust Fund (Trustees) obtained title to a 2,860.53-acre property which constituted the initial area of Edward Ball Wakulla Springs State Park. The Trustees purchased the property under CARL Program. Since this initial purchase, the Trustees have acquired several parcels under P-2000/CARL and P-2000/A and I programs and added them to Edward Ball Wakulla Springs State Park. The park currently contains 4,694.71 acres, consisting of 3,293.47 upland acres and 1,401.24 wetlands—submerged acres.

On October 20, 1986, the Trustees conveyed its management authority of Edward Ball Wakulla Springs State Park to the state agency presently known as the Department Of Environmental Protection, Division of Recreation and Parks (DRP) under Lease No. 3463. The lease is for a period of fifty (50) years, and it will expire on October 19, 2036.

According to the lease agreement between DRP and the Trustees, the DRP will manage Edward Ball Wakulla Springs State Park for the conservation and protection of natural and cultural resources and for resource-based public outdoor recreation which is compatible with the conservation and protection of the property.

Title Interest

The Trustees holds fee title to Edward Ball Wakulla Spring State Park.

Special Conditions on Use

Edward Ball Wakulla State Park is designated single-use to provide resource-based public outdoor recreation and other related uses. There are no legislative or executive directives that constraint the use of the park. Uses such as, water resource development projects, water supply projects, stormwater management projects, linear facilities and sustainable agriculture and forestry (other than those forest management activities specifically identified in this plan) are not consistent with this plan or the management purposes of the park and will be discouraged.

Outstanding Reservations

Following is a listing of outstanding rights, reservations and encumbrances that apply to Edward Ball Wakulla Springs State Park.

**Edward Ball Wakulla Springs State Park
Outstanding Rights, Uses, Encumbrances, Etc.**

<u>Instrument:</u>	Purchase and Sale Agreement
<u>Instrument Holder:</u>	The Nemours Foundation
<u>Beginning Date:</u>	July 9, 1986
<u>Ending Date:</u>	There is no specific ending date.
<u>Outstanding Rights, Uses, Etc.:</u>	The agreement states that the property shall be named "Edward Ball Wakulla Springs State Park".
<u>Instrument:</u>	Special Warrant Deed
<u>Instrument Holder:</u>	The Nemours Foundation
<u>Beginning Date:</u>	September 17, 1986
<u>Ending Date:</u>	There is no specific ending date.
<u>Outstanding Rights, Uses, Etc.:</u>	The warranty deed is subject to certain access and access easements.



Department of Environmental Protection

Jeb Bush
Governor

Marjorie Stoneman Douglas Building
3900 Commonwealth Boulevard, MS 140
Tallahassee, Florida 32399-3000

David B. Struhs
Secretary

March 29, 2001

Liz Cloud, Chief
Bureau of Administrative Code
Department of State
Elliot Building
Tallahassee, Florida 32399-0250

Dear Ms. Cloud:

Enclosed are an original of the public notice and the agenda (with disk) for Edward Ball Wakulla Springs State Park DEP Public Workshop. We would appreciate publication of this notice in the Florida Administrative Weekly's issue of Friday, April 20, 2001.

Please send all invoices for publication of this notice to the letterhead address, Mail Station 525.

If you have any questions, please call (850) 488-2200. Your attention to this matter is appreciated.

Sincerely,

BryAnne White

BryAnne White, Planner
Office of Park Planning
Division of Recreation and Parks

BW/

Enclosures

"More Protection, Less Process"

Printed on recycled paper.

PUBLIC NOTICE

The Florida Department of Environmental Protection, Division of Recreation and Parks announces a public workshop to which all persons are invited.

DATE AND TIME: Wednesday, May 2, 2001, 7:00 PM EDT

PLACE: Edward Ball Wakulla Springs State Park
Wakulla Lodge Terrace
550 Wakulla Park Drive
Wakulla Springs, Florida 32305

PURPOSE: To present the proposed land management plan for Edward Ball Wakulla Springs State Park to the public. A copy of the agenda may be obtained by writing Florida Department of Environmental Protection, Division of Recreation and Parks, Office of Park Planning, 3900 Commonwealth Boulevard, Mail Station #525, Tallahassee, Florida 32399-3000.

Pursuant to the provisions of the Americans with Disabilities Act, any person requiring special accommodations to participate in this meeting is asked to advise the agency at least 48 hours before the meeting by calling Sandy Cook, Park Manager, Edward Ball Wakulla Springs State Park, at (850) 224-5950. If you are hearing or speech impaired, please contact the agency by calling 1-800-342-1335.

EDWARD BALL WAKULLA SPRINGS STATE PARK PUBLIC WORKSHOP

This Meeting Is Open To The Public

Date: Wednesday, May 2, 2001
Time: 7:00 PM EDT
Location: Edward Ball Wakulla Springs State Park
Wakulla Lodge Terrace
550 Wakulla Park Drive
Wakulla Springs, Florida 32305

AGENDA

- 1.** Call To Order
- 2.** Introduction Of Staff And Review Of Agenda
- 3.** Presentation Of Proposed Land Management Plan: The DRP is required to submit an updated land management plan for this property at least every five years under Chapters 253 and 259, Florida Statutes. The DRP proposes to revise the current plan for the property.
- 4.** Public Comment On Proposed Land Management Plan.
- 5.** Adjournment



Department of Environmental Protection

Jeb Bush
Governor

Marjorie Stoneman Douglas Building
3900 Commonwealth Boulevard, MS 140
Tallahassee, Florida 32399-3000

David B. Struhs
Secretary

March 29, 2001

Liz Cloud, Chief
Bureau of Administrative Code
Department of State
Elliot Building
Tallahassee, Florida 32399-0250

Dear Ms. Cloud:

Enclosed are an original of the public notice and an agenda (with disk) for the Edward Ball Wakulla Springs State Park DEP Advisory Group Meeting. We would appreciate publication of this notice in the Florida Administrative Weekly's issue of April 20, 2001.

Please send all invoices for publication of this notice to the letterhead address, Mail Station 525.

If you have any questions, please call (850) 488-2200. Your attention to this matter is appreciated.

Sincerely,

BryAnne White

BryAnne White, Planner
Office of Park Planning
Division of Recreation and Parks

BW/

Enclosures

"More Protection, Less Process"

Printed on recycled paper.

PUBLIC NOTICE

The Florida Department of Environmental Protection, Division of Recreation and Parks announces a DEP Advisory Group Meeting to which all persons are invited.

DATE AND TIME: Thursday, May 3, 2001, 9:00 AM (EDT)

PLACE: Wakulla Lodge
Edward Ball Conference Room
550 Wakulla Park Drive
Wakulla Springs, Florida 32305

PURPOSE: To present and review the proposed land management plan for Edward Ball Wakulla Springs State Park with the park Advisory Group. A copy of the agenda may be obtained by writing Florida Department of Environmental Protection, Division of Recreation and Parks, Office of Park Planning, 3900 Commonwealth Boulevard, Mail Station #525, Tallahassee, Florida 32399-3000, or by calling the Office of Park Planning at (850) 488-2200.

Pursuant to the provisions of the Americans with Disabilities Act, any person requiring special accommodations to participate in this meeting is asked to advise the agency at least 48 hours before the meeting by contacting Sandy Cook, Park Manager, Edward Ball Wakulla Springs State Park, at (850) 224-5950. If you are hearing or speech impaired, please contact the agency by calling 1-800-342-1335.

EDWARD BALL WAKULLA SPRINGS STATE PARK ADVISORY GROUP MEETING

This Meeting Is Open To The Public

Date: Thursday, May 3, 2001

Time: 9:00 AM (EDT)

Location: Wakulla Lodge
Edward Ball Conference Room
550 Wakulla Park Drive
Wakulla Springs, Florida 32305

AGENDA

- 1.** Call To Order
- 2.** Introduction Of Staff And Review Of Agenda
- 3.** Presentation Of Proposed Land Management Plan: The DRP is required to submit an updated land management plan for this property at least every five years to the Board of Trustees of the Internal Improvement Trust Fund under Chapters 253 and 259, Florida Statutes. The DRP is seeking input from the advisory group on the proposed land management plan.
- 4.** Discussion By The Advisory Group On The Proposed Land Management Plan.
- 5.** Public Comments
- 6.** Vote Of The Advisory Group On A Recommendation Concerning The Proposed Land Management Plan. This is a non-binding advisory recommendation to the DRP.
- 7.** Adjournment



Department of Environmental Protection

Jeb Bush
Governor

Marjorie Stoneman Douglas Building
3900 Commonwealth Boulevard, MS 140
Tallahassee, Florida 32399-3000

David B. Struhs
Secretary

March 29, 2001

Parrish Barwick, County Administrator
Wakulla County
Post Office Box 1263
Crawfordville, Florida 32326

Dear Mr. Barwick:

The Florida Department of Environmental Protection, Division of Recreation and Parks will conduct a public workshop for Edward Ball Wakulla Springs State Park on Wednesday, May 2, 2001, at 7:00 PM EDT. The purpose of the meeting is to present the proposed land management plan for Edward Ball Wakulla Springs State Park to the public.

The DEP Advisory Group meeting for this park is scheduled for Thursday, May 3, 2001, 9:00 AM (EDT). The purpose of the meeting is to discuss the proposed land management plan for Edward Ball Wakulla Springs State Park with the DEP Advisory Group

In compliance with subsection 259.032(10), Florida Statutes, the Division of Recreation and Parks is requesting that an announcement of the Division's public workshop and the DEP Advisory Group meeting be made at the Wakulla County Board of County Commissioners meeting on Monday, April 16, 2001. Enclosed are a copy of subsection 259.032(10), Florida Statutes, the public notice and an agenda for the workshop as well as the DEP Advisory Group meeting.

If you have any questions or concerns, please do not hesitate to call me at (850) 488-2200 or email me. My email address is BryAnne.White@dep.state.fl.us. Your consideration and attention to this matter are greatly appreciated.

Sincerely,

BryAnne White

BryAnne White, Planner
Office of Park Planning
Division of Recreation and Parks

BW/

Enclosures

March 29, 2001

To: Sandy Cook, Park Manager
Edward Ball Wakulla Springs State Park

From: BryAnne White, Planner
Office of Park Planning

Subject: Edward Ball Wakulla Springs State Park
DEP Second Public Workshop and
DEP Advisory Group Meeting

The following information (also on disk) is being provided in order to comply with subsection 259.032(10), Florida Statutes:

1. A copy of subsection 259.032(10), Florida Statutes, which requires that:

**Notice of such public hearing shall be posted on the
parcel or project designated for management,
advertised in a paper of general circulation**

2. Public Notice and Agenda for the Public Workshop
3. Public Notice and Agenda for the DEP Advisory Group Meeting

Please post the Public Notice and the Agenda for each of these meetings in the areas of the park that you feel are appropriate for the greatest visibility. In addition, have a public service announcement or an advertisement for the public workshop placed in the local newspaper. **It is important that the public workshop is aggressively promoted at the local level, and that local government, adjacent property owners, special interest groups and the Citizen Support Organization is notified of this workshop.**

If you have any questions or concerns, please do not hesitate to call me at (850) 488-2200 or SunCom 278-2200, or email me. My email address is BryAnne.White@dep.state.fl.us. Your consideration and attention to this matter are greatly appreciated.

BW/

Attachments

cc: Ed Higgins with attachments
Roland Hall with attachments

**Edward Ball Wakulla Springs State Park
Advisory Group List**

Leon Nettles, Chair
Wakulla County Board of County
Commissioners
467 Old Magnolia Road
Crawfordville, Florida 32327

Joseph Duggar Jr., Chair
Wakulla Soil and Water
Conservation District
963 Crawfordville Highway
Crawfordville, Florida 32327

Sandy Cook, Manager
Wakulla Springs State Park
550 Wakulla Park Drive
Wakulla Springs, Florida 32305

Karen Lamonte, Non-Game Biologist
Florida Fish and Wildlife
Conservation Commission
3911 Highway 2321
Panama City, Florida 32409-1658

David Core, District Manager
Florida Division of Forestry
865 Geddie Road
Tallahassee, Florida 32304

Mr. Ken Weber
Florida Division of Forestry
865 Geddie Road
Tallahassee, Florida 32304

Geoff Brown, Visiting Extension Agent
Leon and Wakulla Counties Cooperative
Extension Service
84 Cedar Avenue
Crawfordville, 32327

Nancy Miller, Group Chair
Sierra Club
Big Bend Group
P.O. Box 15732
Tallahassee, FL 32317

Mr. Jim Lyle
Sierra Club
Big Bend Group
3764 Millers Bridge Road
Tallahassee, FL 32312

Jim Crews, President
Apalachee Audubon Society
P.O. Box 1237
Tallahassee, FL 32302-1237

Mr. Gil Nelson
Florida Native Plant Society
PO Box 12938
Tallahassee, 32317-2938

Bonny Holub, Chair
Wakulla County Tourist Development
Council
108 Coastal Highway
Panacea, Florida 32346

Mr. John Harvey
Capital City Cyclists
Off-Road Rides Coordinator
1418 North Adams
Tallahassee, Florida 32303

Terry Tenold, Chair
Florida Trail Association
Apalachee Chapter
1737 Brookside Boulevard
Tallahassee, FL 32301

Ms. Suzanne Lane
Southern Trail Riders Association
630 Kittrell Road
Quincy, FL 32351

Mr. Casey McKinley
Woodville Karst Plain Project
14709 Seminole Trail
Seminole, FL 33776

Mr. Noah Valenstein, Chair
Florida Greenways and Trails Council
3909 Reserve Drive
Tallahassee, Florida 32311

Murray McLaughlin, President
Friends of Wakulla Springs State Park
207 Beatty Taff Dr.
Crawfordville, FL 32327

Mr. Richard Maxey
99 Old Nails Road
Crawfordville, FL 32327

Derrick Hart, Camp Director
YMCA Camp Indian Springs
2387 Bloxham Cutoff Road
Crawfordville, FL 32327

**Edward Ball Wakulla Springs State Park
Advisory Group Staff Report**

The Advisory Group appointed to review the proposed land management plan for Edward Ball Wakulla Springs State Park met at the Wakulla Springs Lodge on May 4, 2001. Mr. Jim Lyle represented Ms. Nancy Miller. Mr. Ken Weber represented Mr. David Core. Mr. Terry Tenold, Mr. Richard Maxey, Mr. Jim Crews, Ms. Karen Lamonte, and Mr. Noah Valenstein did not attend. All other appointed advisory group members attended. Attending staff were Mr. Ed Higgins, Mr. John Bente, Ms. Sandy Cook, Mr. Scott Savery, Mr. Ron Weiss, Mr. Michael Kinnison, Ms. Vanessa Cristler and Mr. Joe Busalacchi.

Mr. Kinnison began the meeting by explaining the purpose of the advisory group and reviewing the meeting agenda. He presented a brief overview of the Division's planning process and explained how the advisory group meeting would be handled.

Discussion On The Proposed Management Plan

Mr. Kinnison discussed the proposed land use concept for Edward Ball Wakulla Springs State Park, and then asked each member of the advisory group to express his or her comments on the plan.

Summary Of Advisory Group Comments

Mr. Lyle asked for a summary of results from the previous evening's public workshop. **Mr. Kinnison** explained that some of the major issues discussed included the construction of a Native American village at the park, converting the laundry facility to a museum, concerns about managing hydrilla in the spring basin and river and public perception regarding plans for limited timber removal as part of upland restoration and establishing camping in the Cherokee Sink area. **Mr. Harvey** asked if the issue of canoe access within the park had been raised. **Mr. Kinnison** explained that this issue was not discussed but was a topic of discussion at the preliminary workshop and the response of those in attendance was overwhelmingly in support of restricting access to this area.

Mr. Lyle asked if the park is ever closed to enforce carrying capacity. **Ms. Cook** indicated that the park has not closed its gate to visitors yet. However, she acknowledged that the park is approaching the point when serious consideration will have to be given to temporarily closing the park on peak days. Staff explained that recent change in parking and that the alternative entrance for lodge guests as proposed in the draft management plan were measures that would aid park staff in the enforcement of carrying capacity.

Commissioner Nettles asked about plans to repair the park fence crossing the river. **Ms. Cook** indicated that the park was working on plans to address this.

Mr. Weber complimented staff on the content of the plan. He explained that the Division of Forestry (DOF) has plans to create trails on newly acquired lands north of 267. In addition, he stated that there was a need for coordination of trail planning. He expressed concerns that plans for shared use trails at the park may present user conflicts. He suggested adding Wakulla State Forest, Lake Talquin State Forest and Tate's Hell State Forest to the plan's discussion of significant land and water resources near the park. He also thought that the plan's discussion of timber harvesting for purposes of revenue generation might be misperceived as a long-term management activity beyond restoration. He encouraged coordination between agencies and offered to be available to provide technical assistance to the park to assist with resource management activities.

Mr. Nelson approved of the plan's reuse of existing facilities and limited expansion of new buildings and parking areas. He was concerned that new uses and facilities, such as a museum, would exceed the ability of existing funding and staff resources to manage. He emphasized that the spread of hydrilla is not only a threat to natural resources but also to the recreational experience and the ability to interpret natural and cultural systems at the park (Mr. Nelson suggested adding language to the plan that clarifies the seriousness of the problem and the park's commitment to

Edward Ball Wakulla Springs State Park
Advisory Group Staff Report

addressing it at the previous evening's public workshop). He encouraged staff to re-examine the proposed shared use trail system and suggested separate trails for different user groups. He was supportive of efforts to restore the Cherokee Sink area and suggested management should strive to recreate pre-settlement natural communities. He stressed the importance of education when undergoing timber harvesting and restoration activities and asked about the potential impact to Sally Ward Creek from the proposed footbridge. **Ms. Cook** explained that there is demand from visitors to access water in different areas of the park but concerns about resource impacts and visitor safety have limited access to the undeveloped areas of the Wakulla River. A boardwalk and bridge system on Sally Ward Creek would address this need in an environmentally sensitive manner, provide an additional interpretive opportunity and improve access to the trail system north of the river.

Commissioner Nettles expressed support for the plan and stated that he agreed with Mr. Maxey (see comments below) that the plan does a good job of balancing recreation, conservation and preservation.

Ms. Holub felt the plan was well written and was supportive of its content. She also believes the control of hydrilla should be a high resource management priority and asked if staff felt the situation would improve. **Mr. Savery** stated that with anticipated increases in funding the park should make progress on managing the invasive exotic. She asked about what was known regarding water clarity in the spring. **Ms. Cook** explained that "dark water" days, or days when water clarity is too poor to run the glass bottom boats, are related to rainfall events and that their frequency appears to be increasing. She indicated that the park is coordinating with researchers in collecting data to improve our knowledge of water quality issues at the spring. **Mr. McKinley** added that stormwater management practices in Leon County are suspected as a factor in changes in groundwater quality. Ms. Holub asked if concerns about resource impacts or a lack of staff resources to handle the crowds was the reason the park might have to be temporarily closed on peak days. **Ms. Cook and Mr. Kinnison** explained that both issues were factors but there is also concern for preserving a quality visitor experience. Ms. Holub stated that the TDC views tourism as an important economic development strategy, but supports its management to protect resources. The TDC tries to encourage visitation to a variety of destinations to spread tourism impacts in the region. She asked if there were going to be staff available to manage use at Cherokee Sink. **Mr. Kinnison** indicated that three full time positions were identified as needed in the plan, and that volunteer host sites were planned to assist staff in this area.

Ms. Lane was pleased with the plan and particularly liked the proposed shared use trails and primitive camping opportunities planned for the Cherokee Sink addition. She indicated that, as an equestrian user, she is not opposed to shared use trails and felt that signage and education would help avoid user conflicts. **Mr. Kinnison** explained that the park has not had problems with user conflicts on the existing shared use trail north of the river was positive. He stated that the level of use on the Cherokee Sink trails was not anticipated to be at a level that would present user conflicts, but that use would be monitored, and, if necessary, portions of the trail system designated as single use in the future.

Mr. McLaughlin urged park staff to pay careful attention to public perception when undergoing timber removal as part of restoration. He would like to see expanded interpretation of Native American and African American cultural history at the park and encouraged the involvement of local residents of these communities in developing these opportunities. He would appreciate seeing an interpretive facility on a grander scale than what the Pavilion will provide. He did not object to equestrian use of trails but encouraged the monitoring of trail use to help avoid user conflicts. Mr. McLaughlin was very concerned about elevated nitrate levels in the spring and believed that there may be a connection with the wastewater spray fields in Leon County.

Mr. Harvey asked why the plan indicated that new trails would try to be routed on existing paths

**Edward Ball Wakulla Springs State Park
Advisory Group Staff Report**

and roadways. **Mr. Savery and Mr. Kinnison** indicated that staff felt using portions of the existing network of roads and jeep trails would be less costly than blazing new trails and it would minimize resource impacts. As an off-road cyclist, Mr. Harvey supports single track trails. However, given the density of vegetation surrounding existing pathways, and the effort it would take to clear new trails, he believes shared use is reasonable in this area. He also thinks the trails will get minimal use by bicyclists due to the extensive presence of soft sand and believes stabilization of trail surfaces would be necessary to create usable bike trails. He recommends allowing bicycle crossing of the proposed Sally Ward Creek bridge to allow a connection between the lodge and the trail north of the river. He asked about plans for restoration on the Cherokee Sink addition. **Mr. Savery** explained that prescribed fire would be used in some areas but that the density of hardwood growth would make fire impractical in many areas and consideration will be given to allowing some areas to mature into hardwood forests. **Ms. Cook** pointed out that the primary reason for the acquisition of this property was to provide protection to groundwater resources not for the quality of the existing natural communities. Mr. Harvey encouraged cooperation between the park and DOF to provide trails connecting adjacent public lands. He recommended considering establishing bike access from the lodge to Cherokee Sink along SR 61 and Wakulla Cutoff. He was pleased to see the area of McBride Slough on the optimum boundary map and recommended extending the boundary to include additional springs located to the north. He asked that consideration be given to allowing bike access on the existing service road that runs along the river through the Sanctuary. **Mr. Kinnison** explained that this area has long been designated off limits to the public to provide an area free from human disturbance and that staff believes ample access is provided to other areas of the park.

Mr. Lyle expressed concerns that the current draft plan would contribute to carrying capacity problems at the park. He recommended scaling back the proposed uses and facilities and would like to see money that would be spent on facility upgrades used for the purposes of restoration. He is opposed to establishing shared use trails and would like to see a separate section in the plan devoted to monitoring with specific cost estimates. He also recommended extending the optimum boundary west to Spring Creek Road.

Mr. Hart concurred with Mr. Harvey that the proposed shared use trail would likely be too sandy for bicyclists. He explained that similar trails on the adjacent YMCA property are considered less than ideal by cyclists.

Mr. Duggar reminded the group that the primary purpose of acquisition of the Cherokee Sink area was for groundwater protection. He urged staff to limit facility development so as not to contribute to groundwater degradation. **Mr. Kinnison** responded that the plan focused largely on improvements to existing facilities and use areas within the main use area of the park. He further stated that new facilities were being developed to improve management of areas of traditional use. He stated that staff had made a conscious effort to develop a modest plan that was realistic and responsible in balancing resource protection and public recreation needs. He indicated that proposed uses and facilities in the plan should not significantly increase park visitation at the lodge and waterfront complex. Mr. Kinnison explained that with the Cherokee Sink addition, the Division has a responsibility to provide public access and that proposed facilities are necessary to enhance management of use in an area that has traditionally served as a popular recreation spot. He stated that by encouraging use at Cherokee Sink, some of the pressures on the waterfront and lodge area would be relieved by spreading use to a new area of the park. He also pointed out that the park has set aside significant areas of the river and uplands as a sanctuary and/or protected zone and that developed areas of the park comprise a very small portion of total area. **Ms. Cook** added that proposed facilities at Cherokee Sink were aimed at protecting sensitive natural and cultural resources and increasing public safety in the area. **Mr. Duggar** explained the purpose and scope of the special planning district established by ordinance to protecting surface and groundwater conduits to Wakulla Springs. He asked if the park was looking into acquiring property within the

**Edward Ball Wakulla Springs State Park
Advisory Group Staff Report**

district. **Ms. Cook** indicated that this area was identified on the optimum boundary map. **Mr. Duggar** encouraged coordination of acquisition efforts between the Soil and Water Conservation District and the Division of Recreation and Parks. He also stated that an extensive system of monitoring wells was in place around the wastewater spray fields in Leon County and that the data collected was available to the public.

Commissioner Nettles expressed his appreciation for the park and its contribution to protecting the sensitive resources of the area. He also felt that the spray fields were contributing to elevated nutrients and the spread of hydrilla in the river.

Ms. Cook stated how appreciative she was for the support the park receives and expressed her commitment to continue managing park resources in a responsibly, balanced manner.

Mr. McKinley emphasized that the unique features of the park are underground and that the Wakulla Springs cave system is unique on a global scale. He expressed his desire for the park to maintain a balance between resource protection, restoration and development of facilities, and hoped that staffing needs would be funded. He explained the composition and purpose of the Wakulla Springs Water Quality Work Group and encouraged participation by interested parties. He was pleased to see the plan address upgrading interpretive exhibits and supported the interpretive center concept. He would like to see the boat tours address interpretation of the cave system and offered to assist in developing interpretive content. He echoed other members' comments regarding the prioritization of the hydrilla problem and recommended addressing an area of erosion caused by vehicles accessing the basin during hydrilla removal projects. He supports maintaining diving access at Cherokee Sink since public access to other sites in the area is diminishing, and this location provides a relatively safe diving environment. He concurred with the inclusion of areas to the northwest of the park in the plan's optimum boundary due to their importance in protecting groundwater conduits.

Mr. Brown explained the extension service's interest in supporting education efforts at the park. He recommended considering an alternative to the Sally Ward Creek nature trail that would allow additional exploration of the park and liked the plan for additional interpretive signage. He believed volunteer hosts could be an important asset to the park and suggested considering using them as docents that could expand interpretation in other areas of the park. He supports establishing primitive camping and feels it is another opportunity to expand the recreational experience and further educate visitors about the resources of the park. He was glad to see that there were no plans to open the river to canoe/kayak access.

Mr. Weber asked if there was pressure to provide hunting access to the Cherokee Sink addition.

Ms. Cook stated that the public appeared to be accepting the prohibition of hunting in this area.

Mr. Weber asked if user fees generated at the park were available for use onsite and if funds were provided to the county. **Ms. Cook** explained that user fees at state parks are put into a trust fund and distributed among all parks and that they currently pay roughly half of operating expenses. **Mr. Higgins** explained that funds are not automatically given to counties but the Division makes grant funds available for the development of recreation facilities. He also pointed out the economic impact that state parks have on the local economy in terms of direct expenditures and jobs.

Mr. Duggar asked how construction projects were regulated. **Ms. Cook** explained that construction projects go through the normal state and local permitting process. **Mr. Duggar** asked if retention areas were constructed as part of recent paving and parking projects. **Ms. Cook** affirmed that retention areas had been developed, and that the parking projects incorporated pervious surfaces to help address stormwater management.

The following comments were provided in writing by Advisory Group members unable to attend the meeting.

Mr. Maxey expressed strong support for the draft management plan. Specifically, he believes it

Edward Ball Wakulla Springs State Park
Advisory Group Staff Report

properly balances recreation, conservation and preservation; allows for moderate increases in recreation while protecting pristine areas; and focuses recreational use in current use areas and less sensitive areas of the park.

Mr. Tenold was supportive of planned improvements on the existing trail system and expanding recreational use on the Cherokee Sink addition. He expressed concern that the proposed shared use trail would not provide a quality hiking experience and recommended revising the plan to include development of a single-use hiking trail.

He also felt the river should be opened to canoe and kayak access on a limited, controlled basis.

Summary Of Public Comments

Mr. Ferguson outlined the concept of a living Native American Village to be built within the park. The village would include multiple structures built using traditional Native American architectural styles and include a more modern building that would serve as a conference and educational facility. The conference center would incorporate principles of sustainable design to limit resource impacts. Square ground and a playing field would be incorporated into the village where traditional games and events would be held. Mr. Ferguson explained that classes would be offered on Native American skills, crafts, culture and language. He indicated that the preferred location was just west of the lodge but the Cherokee Sink addition would also be suitable. He stated that the village concept had broad support among different tribal groups and would be built using outside funding sources. **Mr. Kinnison** explained that a proposal of this scale was beyond the scope of development being considered for the current planning period but encouraged Mr. Ferguson to maintain a dialogue with the Division. He stated that while the village concept could not be incorporated into the current draft plan, the park would welcome assistance in expanding Native American heritage interpretation and addressing creative ways (talks, special events, etc.) to do this.

Ms. Carr asked why a canoe launch that was proposed in an earlier draft of the plan had been removed. **Mr. Kinnison** explained that staff felt this facility was redundant given the presence of the county boat ramp directly across from the proposed site. Ms. Carr urged staff to keep the proposed Sally Ward Creek bridge limited to foot traffic only. She was concerned that allowing bicycle crossings would pose a safety hazard and would eliminate consideration of more interesting design types for a bridge. She also recommended adding language to the plan that emphasized the role of the tour boats as a cultural resource, since boating has a long history in the basin and the boats are an important part of cultural interpretation at the park. She believed that emphasizing this in the plan might assist the park in acquiring grant funding for tour boat improvements. **Mr. Kinnison** asked that she generate language for consideration.

Advisory Group Recommendation

Following public comments, the Advisory Group members were asked for a non-binding recommendation concerning the Edward Ball Wakulla Springs State Park proposed draft unit management plan. With the exception of **Mr. Lyle**, all members present agreed that the draft plan was appropriate and should be approved. Mr. Lyle's dissenting vote was based on his belief that the plan places too much emphasis on park development and too little emphasis on restoration.

The meeting was then adjourned.

Staff Recommendations

Staff recommends approval of the proposed management plan for Edward Ball Wakulla Springs State Park as presented with the following changes.

1. Trails

- A.** To ensure compatibility between user groups on the proposed shared use trail system, language will be added to the plan that commits to educating user groups, monitoring use

**Edward Ball Wakulla Springs State Park
Advisory Group Staff Report**

and taking management measures to address problems when necessary. Actions may include increased education, trail re-routing or closure to different users. Staff do not recommend separate single-track trails at this time since existing shared use trails have not proven to present user conflicts and the use of the proposed trail system is not anticipated to reach levels that would present conflicts in the near future. Costs associated with monitoring use are not significant enough to recommend adding to the Priority Schedule and Cost Estimates at this time.

- B.** Out of concerns for public safety, bicycle riding across the proposed Sally Ward Creek bridge will be prohibited. This connection is not considered critical given that the existing shared use trail system currently connects with the park drive a short distance north of the proposed bridge location. However, if the final bridge design permits, bicyclists may be allowed to walk their bicycles across to facilitate connection with the lodge and waterfront.
 - C.** Language will be added to the plan stating that the Division will encourage the county to establish bike lanes on CR 61 and Wakulla Springs Cutoff to provide a paved bicycle route to Cherokee Sink. In the interim, a spur trail will be recommended across from the proposed alternative entrance that links with the proposed shared use trail so that off road bicyclists can ride between the main park use area and Cherokee Sink.
 - D.** Staff do not recommend establishing additional trails near the lodge and waterfront complex. Improvements to the Sally Ward Creek trail are believed to provide sufficient hiking opportunities in this area.
- 2. Canoe/Kayak Access on Wakulla River**
 - A.** Staff recommends against establishing canoe and kayak access on the Wakulla River within park boundaries. The natural resources in this area are extremely sensitive to disturbance, and include several bird rookeries, an active eagle nest and a bat colony. Prohibiting public access into this area provides a refuge for an abundance of wildlife and increases opportunities for wildlife viewing on the tour boats and other areas of the park. It would be extremely difficult for management to allow access on a limited basis once this area was open. Since there is no other stretch of the Wakulla River that is free from human disturbance, the unique character of this area warrants maintaining it as a no access zone.
- 3. Cultural Resource Interpretation**
 - A.** Language will be added to the plan that commits to expanding interpretation of Native American and African-American cultural history and coordinating with local representatives of these cultural groups in the development of additional interpretive opportunities.
 - B.** The proposed Interpretive Center will serve to address cultural resource interpretive needs. However, language will be added to the plan that acknowledges the need for and encourages future consideration of a more expansive facility that would serve as a visitor and education center at the park.
- 4. Tour Boats**
 - A.** Add language to the discussion of Existing Facilities that emphasizes the importance of the tour boats to the visitor experience and interpretation of the pre-historic and historic use of the basin.
- 5. Revision to the Introduction**
 - A.** Add Wakulla State Forest, Lake Talquin State Forest and Tate's Hell State Forest to the plan's discussion of significant land and water resources in vicinity of the park.
- 6. Hydrilla Management**
 - A.** Add language to the plan that clarifies the seriousness of the hydrilla problem and the commitment of park staff to addressing it.
- 7. Optimum Boundary**
 - A.** No additional changes are recommended to the optimum boundary map. The area east of Spring Creek Road has existing structures on it and the parcels north of McBride Slough are part of an existing CARL project.

**Edward Ball Wakulla Springs State Park
Advisory Group Staff Report**

8. Erosion Control

- A. Need to address comments regarding erosion caused by vehicles accessing the basin during hydrilla removal projects.



Department of Environmental Protection

Jeb Bush
Governor

Marjorie Stoneman Douglas Building
3900 Commonwealth Boulevard, MS 140
Tallahassee, Florida 32399-3000

David B. Struhs
Secretary

July 23, 2001

Ed Mills, Director
Wakulla County Planning and Zoning
340 Trice Lane, Room 102
Crawfordville, Florida 32327

Dear Mr. Mills:

Enclosed is our proposed management plan for Edward Ball Wakulla Springs State Park. Please advise in writing as to the following:

1. Whether or not a Local Government Comprehensive Plan has been adopted for the area which encompasses this park, pursuant to Section 163.3167, Florida Statutes.
2. Whether or not a determination of compliance with regard to the Local Government Comprehensive Plan has been made by the Department of Community Affairs, pursuant to Section 163.3167, Florida Statutes.
3. Whether or not this management plan is consistent with the Local Government Comprehensive Plan.

I appreciate your timely review of this management plan. Please provide your response by September 1, 2001, so I may share them with the Office of Environmental Services.

You may send your comments by fax (850) 487-3939 or SC 277-3939. If you prefer, email BryAnne.White@dep.state.fl.us. Please do not hesitate to call me at (850) 488-2200 if you have any questions or concerns that you would like to discuss. Your consideration and attention to this matter are greatly appreciated.

Sincerely,

BryAnne White

BryAnne White, Planner
Office of Park Planning
Division of Recreation and Parks

BW/
Enclosur

Addendum 2—References Cited

Edward Ball Wakulla Springs State Park
References Cited

- Bryne, Stephen, C. 1988. Florida Archaeological Reports 6, Archaeological Survey at the Edward Ball Wakulla Springs State Park, Bureau of Archaeological Research, Division of Historical Resources, Florida Department of State, Tallahassee, Florida.
- Florida Natural Areas Inventory and the Florida Department of Natural Resources, 1990. Guide to the natural communities of Florida. Tallahassee, FL. 111 pp.
- Jackson, Dale, R. 1997. Reproduction in the Suwannee Cooter, Bulletin of the Florida Museum of Natural History, Volume 41 No. 2 PP. 69-167, University of Florida, Gainesville, Florida.
- Jones, Calvin, B. 1988. Walkover Survey of Six 2 acre parcels of Land in Wakulla Springs State Park. Survey Report #1548, on file in the Florida Master Site File, R.A. Gray Bldg., Tallahassee, FL.
- 1988b Archaeological Survey of Maintenance Center and Toll Booth Road Pull-over at Wakulla Springs State Park. Survey Report #1614, on file in the Florida Master Site File, R.A. Gray Bldg., Tallahassee, FL.
- 1990a Monitoring of Facility Improvements in the Vicinity of the Lodge at Wakulla Springs State Park. Survey Report #2503, on file in the Florida Master Site File, R.A. Gray Bldg., Tallahassee, FL.
- 1990b Post Hole Testing within Area of Proposed Greenhouse at Wakulla Springs State Park. Survey Report #2483, on file in the Florida Master Site File, R.A. Gray Bldg.
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Addendum 3—Soil Descriptions

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(3) Lutterloh sand, 0-5 percent slope - Lutterloh sands consist of somewhat poorly drained, moderately permeable, nearly level soils in lower positions on uplands. They formed in unconsolidated deposits of marine sandy and loamy sediments. Slopes range from 0 to 5 percent. A water table is 12 to 30 inches below the surface for one to two months in most years. Soil reaction ranges from extremely acid to strongly acid. Texture ranges from loamy sand to sandy clay loam and is frequently stratified.

(4) Alpin sand, 0-5 percent slope - Alpin sands consist of excessively drained, very rapidly permeable, and nearly level to gently sloping soils on high uplands. They formed in thick beds of wind or marine sand deposits. Slopes range from 0 to 5 percent. The water table is below a depth of 80 inches throughout the year. Soil reaction is very strongly acid to medium acid. Texture ranges include sand, loamy sand, and sandy loam.

(7) Otela fine sand, 0-5 percent slope - Otela fine sands consist of moderately well-drained soils on nearly level to sloping low knolls, broad uplands, and side slopes adjacent to stream channels on the Coastal Plain. They formed in sandy and loamy marine or eolian sediment. Slopes range from 0 to 5 percent. A perched water table is above the subsoil during wet periods and at a depth of more than 72 inches for the remainder of the year. Soil reaction ranges from very strongly acid to moderately alkaline. Texture ranges include loamy fine sand, fine sand, sand, sandy clay loam, sandy loam, and fine sandy loam.

(11) Shadeville fine sand, 0-5 percent slope - Shadeville fine sands consist of moderately deep, well-drained soils on smooth to undulating uplands. Slopes range from 0 to 5 percent. The water table is greater than 6 ft. deep year-round. Soil reaction ranges from strongly acid to moderately alkaline with increasing depth. Textures include fine sand, fine sandy loam, sand, sandy loam, and sandy clay loam.

(12) Shadeville-Seaboard fine sand, 0-3 percent slope - Shadeville-Seaboard fine sands are a complex of Shadeville fine sands (described above) and Seaboard fine sands, the latter consist of moderately well drained, nearly level to gently undulating soils, occurring on lower uplands and on higher positions in flat-woods. Slopes range from 0 to 3 percent. The seasonal high water table is deeper than 48 in. for the majority of the year. Soil reaction ranges from strongly to slightly acid. Textures are sand and fine sand.

(14) Ridgewood fine sand, 0-5 percent slope - Ridgewood fine sands consist of somewhat poorly drained rapidly permeable soils on uplands. They formed in thick beds of sandy marine deposits. Slopes range from 0 to 5 percent. The water table is 24 to 40 inches for 2 to 4 months or more during most years, rising for brief periods with rain and dropping below 40 inches when extremely dry. Soil reaction ranges from very strongly acid to medium acid. Texture is sand or fine sand.

(17) Ortega sand, 0-5 percent slope - Ortega sands consist of moderately well drained, rapidly permeable, and nearly level to gently sloping soils on ridges on the uplands. They formed in thick sandy marine or wind deposits. Slopes range from 0 to 5 percent. The water table is generally from 60 to 72 inches below the surface, but is occasionally from 40 to 60 inches during heavy rainfall. Soil reaction is very strongly acid to slightly acid. Texture includes sand and fine sand.

(21) Lakeland sand, 0-5 percent slope - Lakeland sands consist of excessively drained, very rapidly permeable, and nearly level to gently sloping soils on high upland areas. They formed in thick deposits of marine, wind or fluvial sand deposits. Slopes range from 0 to 5 percent. The water table is below a depth of 80 inches. Soil reaction ranges from very strongly acid to medium acid throughout. Texture is loose sand.

(23) Leon sand - Leon sands consist of poorly drained, moderately to rapidly permeable, nearly level soils on broad flat wood areas and in some places along drainageways. They formed in thick beds of sandy marine sediments. Slopes are less than 2 percent. The water table is at a depth of 10 to 40 inches for more than 9 months and a depth of less than 10 inches for 1 to 4 months during

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periods of high rainfall. Soil reaction ranges from extremely acid to strongly acid at all depths. Texture is sand or loamy sand.

(26, 28, 44) Tooles-Nuttall fine sands - Tooles-Nuttall fine sand is a complex that consists of very poorly to poorly drained, nearly level soils in flat woods. The water table is high, within 0-20 inches year round and in some case floods up to 6 months of the year. Soil reaction is very strongly acid to moderately alkaline. Textures include fine sand, sand, sandy, sandy clay loam and sandy clay.

(27) Moriah-Pilgrims fine sands - Moriah-Pilgrims fine sands are a complex consisting of somewhat poorly drained, slowly to moderately permeable, nearly level soils of low uplands and flat woods. They formed in sandy and loamy marine sediments. Slopes range from 0 to 2 percent. The water table is within a depth of 18 to 36 inches for 2 to 5 months in most years. Soil reaction ranges from extremely acid to moderately alkaline with increasing depth. Textures include sand, fine sand, sandy clay loam, sandy clay, and sandy loam.

(32) Plummer fine sand - Plummer fine sands consist of poorly drained, moderately permeable, nearly level soils on broad low areas, in poorly defined drainageways, and in depressional areas. They formed in marine or fluvial sediments. Slopes range from 0 to 2 percent. The water table is at the surface or within a depth of 15 inches for 3 to 6 months in most years. Soil reaction is very strongly acid to medium acid. Textures range through fine sand, muddy fine sand, sandy loam, fine sandy loam, or sandy clay loam.

(33) Pottsburch sand - Posttsburgh sands consist of poorly drained, moderately permeable, nearly level soils in flat woods. They formed in a thick sandy deposit on marine terraces. Slopes range from 0 to 2 percent. The water table is at depths of less than 12 inches for 1 to 4 months or longer during most years. Soil reaction ranges from extremely acid to medium acid. The texture is fine sand.

(35) Rutledge sand - Rutledge sands consist of very poorly drained, rapidly permeable, nearly level soils in shallow depressional areas and narrow natural drainageways. They formed in deposits of sandy marine sediments. Slopes range from 0 to 2 percent. The water table is at or near the surface most of the year. Many areas are flooded frequently for brief periods. Soil reaction ranges from extremely acid to medium acid. Textures include sand, fine sand, loamy sand and loamy fine sand.

(39) Surrency mucky fine sand - Surrency mucky fine sands consist of very poorly drained, rapidly permeable, nearly level soils in depressions and drainageways. They formed in loamy marine or fluvial deposits. The mapped areas are circular or irregular in shape. Slopes are less than 1 percent. The soil is ponded for 6 to 9 months of the year. The high water table is at or near the surface for the remainder of the year. Soil reaction is extremely acid to strongly acid. Textures include mucky fine sand, fine sand, sand, fine sandy loam, sandy loam, and sandy clay loam.

(47) Otela-Alpin fine sands, 0-5 percent slopes - Otela-Alpine fine sands are a complex consisting of alpine fine sands (described above) and Otela fine sands. The latter consist of deep, moderately well drained, moderately to moderately rapidly permeable soils on broad uplands. They formed in sandy and loamy marine sediments over limestone on a karst topography. Slopes range from 0 to 5 percent. The water table is perched above about 50 in. for about 1 to 4 months or for short durations during periodic high rainfall. Soil reaction is very strongly to strongly acid. Textures include fine sand, fine sandy loam and sandy clay loam.

(48) Otela Limestone substratum Ortega sands, 0-5 percent slope - Otela limestone substratum Ortega sands is a complex consisting of Otela fine sands, (described in Otela-Alpine fine sands) and Ortega fine sands (also described above).

Addendum 4—FNAI Natural Communities Descriptions

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(17) Sinkhole. (synonyms: lime sink, sink, solution pit, cenote, grotto, doline, chimney hole, banana hole). Sinkholes are generally characterized as cylindrical or conical depressions with steep limestone walls. Those which drain readily and only contain standing water during or for short periods following heavy rains are considered to be Sinkholes, while those which contain water throughout most of the year and dry down only during extreme droughts are considered to be Sinkhole Lakes. The differences between these two communities are often subtle. They may occur together if the upper portions of the limestone are typically above water level, while the lower portions are typically below water level.

The vegetative structure of Sinkholes may be that of a well-developed forest where sands cover the rock and/or the sides of the Sinkholes are moderately sloped. These conditions are typically confined to the upper portions and around the rim of the Sinkhole. Steeper rock walls are generally more or less covered by mosses, liverworts, and ferns with occasional herbs and shrubs in crevices. Typical plants include southern magnolia, sweetgum, wax myrtle, wild grape, Virginia creeper, poison ivy, partridgeberry, greenbrier, water oak, flowering dogwood, horse sugar, sparkleberry, diamondleaf oak, live oak, hophornbeam, tupelo, white ash, Florida maple, pignut hickory, beautyberry, and gum bumelia. Steep rock walls are more or less covered by a variety of mosses, liverworts, ferns, and sometimes herbs, including such rare and threatened species as Venus'-hair fern and halberd fern. Sinkholes provide habitat for relictual populations of many species of salamanders and invertebrates that would be unable to survive in otherwise drier areas.

Sinkholes are most common in karst areas where the underlying limestone has been riddled with solution cavities by the chemical and physical actions of underground waters. As these cavities enlarge and become interconnected, large underwater caverns develop. When water tables drop, the cavern roof is no longer supported by the hydrostatic pressure and portions of it may collapse, leaving a deep cylindrical or conical surface depression known as a Sinkhole. The organic and mineral debris that collapsed into the cavity may partially occlude, but generally does not completely block the Sinkhole's connections with the underground water table. Thus, Sinkholes frequently function as aquifer recharge areas. Some Sinkholes are the relics of ancient springs or swallowholes, with flow having ceased because of lower water tables. The relic stream bed may still be discernible, but has been obliterated in most cases.

Steep limestone walls generally restrict soils to organic accumulations in cracks and crevices. Where the sides of a sinkhole have collapsed, sands may have slumped over the limestone, creating conditions similar to a Slope Forest.

Sinkholes generally have a very moist microclimate. The depression itself helps protect the Sinkhole from drying winds, while the fringe of trees surrounding the Sinkhole often form a nearly complete canopy which shelters the Sinkhole from intensive insolation. Additionally, seepage from the surrounding uplands may slowly moisten the walls, while the frequent presence of standing water contributes to the high humidity. These conditions may also buffer temperature extremes, allowing a unique mixture of tropical and temperate flora to exist in many Florida Sinkholes.

Sinkholes and Sinkhole Lakes are often the antecedents of other Lacustrine and Palustrine communities, including Dome Swamp; Depression Marsh; and Sandhill Upland, Flatwoods and Prairie Lakes. When several Sinkholes coalesce, Basin Marsh or Swamp and Clastic Upland, Marsh or Swamp Lakes may eventually develop. Thus, the distinctions between Sinkhole communities and other related communities are frequently subtle, as one very gradually succeeds to another. The limestone dissolution processes that initiated their development continue, and subsequent droughts which lower ground water tables could renew the Sinkhole development process.

Sinkholes are extremely fragile communities. Their popularity as recreational areas subjects their flora to trampling and their steep walls to severe erosion from foot traffic and, in some cases, from

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dirt bikes. Sinkhole Lakes attract swimmers and divers whose activities may disturb the aquatic community as well. The unique flora of many Sinkholes has made them additionally vulnerable to overcollection.

Sinkholes are frequently used as dump sites. These activities will degrade water quality in the Sinkhole and eventually the underground aquifer. Thus, litter and refuse should be removed promptly when they occur. Similarly, pollution of the water supplies (aquifer and seepage sources) should be avoided. Chemical applications, waste treatments, and spills on the surrounding upland should be closely monitored to determine their potential impacts and mitigation requirements.

The delicate microclimate of Sinkholes may also be easily disturbed by activities in the surrounding areas. Logging of the surrounding canopy will increase both insolation and sedimentation levels, while major soil disturbances in the surrounding uplands could disrupt seepage water sources. Large withdrawals of groundwater nearby could substantially lower water tables and reduce the hydroperiods of Sinkhole Lakes. Any of these activities could significantly alter the microclimate and induce deleterious vegetational responses. Likewise, the invasion of exotic plant species is also a concern in these important communities.

(20, 21) Upland Hardwood And/Or Upland Mixed Forest. (synonyms: mesic hammock, climax hardwoods, upland hardwoods, beech-magnolia climax, oak-magnolia climax, pine- oak-hickory association, southern mixed hardwoods). Upland hardwood forests and upland mixed forests are characterized as well-developed, closed-canopy forests of upland hardwoods on rolling hills. These communities have quite similar physical environments and share many species, including southern magnolia, pignut hickory, sweetgum, Florida maple, devil's-walkingstick, American hornbeam, redbud, flowering dogwood, Carolina-holly, American holly, eastern hophornbeam, spruce pine, loblolly pine, live oak, and swamp chestnut oak, among others. The primary difference between these communities is that upland mixed forests generally lack shortleaf pine, American beech and other more northern species that typically occur in upland hardwood forests. This is predominantly a result of minor climatic differences, upland hardwood forests being most common in northern panhandle Florida and upland mixed forests being most common in northern and central peninsular Florida. Other typical plants include gum bumelia, hackberry, common persimmon, red cedar, red mulberry, wild olive, red-bay, laurel cherry, black cherry, bluff oak, water oak, cabbage palm, basswood, winged elm, Florida elm, sparkleberry, Hercules'-club, slippery elm, American beautyberry, partridge berry, wild sarsaparilla, greenbrier, trilliums, beech drops, passionflower, bedstraw, strawberry bush, silverbell, sedges, fringe tree, horse sugar, white oak, and blackgum. Typical animals include grey rat snake, moles, woodcock, barred owl, pileated woodpecker, white-tailed deer, grey squirrel, shrews, gray fox, cotton mouse, wood rat, box turtle, red- bellied snake, coral snake, eastern glass lizard, broad headed skink, ground skink, slimy salamander, grey treefrog, bronze frog, green anole, and rough green snake.

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

In the mature system, tree density and species diversity are relatively high, inducing much competition for space, water, sunlight and nutrients. Very little of these elements goes unused

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because of the intricate mosaic of plants that captures almost all sunlight and effectively recycles nutrients through the system. Succession is generally isolated to areas where trees have fallen and created openings in the canopy.

Upland hardwood forests and upland mixed forests are climax communities for their respective geographic locations. They are often associated with and grade into upland pine forest, slope forest, and xeric hammock. Occasionally, upland mixed forests may also grade into maritime hammock or prairie hammock. During early stages of succession, upland hardwood-and mixed forest may be difficult to distinguish from upland pine forests that have not been burned for several years. Disturbed sites may require hundreds of years to reach full development with species compositions representative of climax conditions.

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

(22) Upland Pine Forest. (synonyms: longleaf pine upland forest, loblolly-shortleaf upland forest, high pineland, etc.) Upland pine forest is characterized as a rolling forest of widely spaced pines with few understory shrubs and a dense ground cover of grasses and herbs. Pristine areas are dominated by longleaf pine and wiregrass, while areas that suffered agricultural disturbances are dominated generally by shortleaf and loblolly pines and old field grasses and herbs. Other typical plants include [southern red oak, runner oak, bluejack oak, blackjack oak, post oak, sassafras, black cherry, gallberry, persimmon, mockernut hickory, twinflower, huckleberry, dangleberry, goldenrod, indian grass, partridge pea, goats rue, winged sumac, blueberry, dog fennel, snakeroot, goldenaster, spurge, yellow jessamine, bluestem broom sedge, asters, pencil flower, bracken fern, cat greenbrier, fox grape, flowering dogwood, sweetgum, blackgum, etc.]. Typical animals include [deer, bobcat, gray fox, six-lined racerunner, fence lizard, eastern diamondback rattlesnake, gopher tortoise, fox squirrel, cotton rat, cotton mouse, barred owl, bobwhite, red-bellied woodpecker, etc.].

Upland pine forest occurs on the rolling hills of extreme northern Florida. The soils are composed of sand with variable, sometimes substantial, amounts of Miocene clays. The proportion of sand in most of these soils has been substantially reduced by erosion due to past agricultural activities. The resultant prevalence of clays helps retain soil moisture, creating more mesic conditions than originally would have occurred. Thus, many plants, which previously were restricted to valleys and other low areas, may now inhabit the upland pine forests.

Fire is a dominant factor in the ecology of this community, because it reduces hardwood encroachment and facilitates pine and wiregrass reproduction. Without relatively frequent fires, upland pine forest succeeds to upland mixed forest and eventually to upland hardwood forest. The natural fire frequency appears to be every 3 to 5 years. More frequent fires would likely eliminate pine recruitment, especially when loblolly and shortleaf pines are dominant species.

Upland pine forest is a fire-climax community that is associated with and often grades into upland mixed forest or upland hardwood forest. Gradations between these communities are frequently so subtle that distinctions are usually arbitrary. Upland pine forest is often confused with sandhill. The primary differences between them reside in their soil characteristics and some species of plants and animals.

Upland pine forests have been substantially degraded throughout their range. The sandy clay soils were prime agricultural lands for plantations as well as American Indians. Thus, the longleaf pines were logged, the soil was turned, and the wiregrass disappeared. Only isolated tracts of the original longleaf pine-wiregrass association remain, the bulk being replaced by loblolly-shortleaf pine associations. Most of the later have further succeeded to mixed upland forest because of fire

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exclusion. The restoration of upland pine forest to its original condition is impeded by the current inability to propagate wiregrass where it has been extirpated.

(25) Basin Swamp. (synonyms: gum swamp, bay, bayhead, swamp). Basin Swamp is generally characterized as a relatively large and irregularly shaped basin that is not associated with rivers, but is vegetated with hydrophytic trees and shrubs that can withstand an extended hydroperiod.

Dominant plants include blackgum, cypress, and slash pine. Other typical plants include maple, swamp redbay, sweetbay magnolia, loblolly pine, Virginia willow, fetterbush, laurel greenbrier, Spanish moss, wax myrtle, sphagnum moss, and buttonbush. Typical animals include southern dusky salamander, cricket frog, little grass frog, chicken turtle, striped mud turtle, ringneck snake, scarlet snake, crayfish snake, cottonmouth, wood duck, hawks, turkey, great horned owl, barred owl, pileated woodpecker, songbirds, gray squirrel, black bear, raccoon, mink, river otter, bobcat, and white-tailed deer.

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

Infrequent fire is essential for the maintenance of cypress dominated Basin Swamps. Blackgum and hardwood dominated Basin Swamps burn less often, while pine dominated Basin Swamps burn more frequently. Without fire, hardwood invasion and peat accumulation will eventually create a Bottomland Forest or Bog. Typical fire intervals in Basin Swamps may be anywhere from 5 to 150 years. Cypress and pines are very tolerant of light surface fires, but muck fires burning into the peat can kill the trees, lower the ground surface, and transform a swamp into a pond or lake.

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

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

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

(30) Dome Swamp. (synonyms: isolated wetland cypress dome, cypress pond, gum pond, bayhead, cypress gall, pine barrens pond). Dome Swamps are characterized as shallow, forested, usually circular depressions that generally present a domed profile because smaller trees grow in the shallower waters at the outer edge, while bigger trees grow in the deeper water in the interior. Pond cypress, swamp tupelo, and slash pine are common plants. Other typical plants include red maple, dahoon holly, swamp bay, sweetbay, loblolly bay, pond apple, Virginia willow, fetterbush, chain fern, netted chain fern, poison ivy, laurel greenbrier, Spanish moss, wild pine, royal fern, cinnamon fern, coastal plain willow, maidencane, orchids, wax myrtle, swamp titi, St. John's wort, sawgrass, lizard's tail, swamp primrose, water hyssop, redroot, sphagnum moss, floating heart, buttonbush,

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arum, and fire flag. Typical animals include flatwoods salamander, mole salamander, dwarf salamander, oak toad, southern cricket frog, pinewoods treefrog, little grass frog, narrowmouth toad, alligator, snapping turtle, striped mud turtle, mud turtle, eastern mud snake, cottonmouth, woodstork, wood duck, swallow-tailed kite, barred owl, pileated woodpecker, great-crested flycatcher, prothonotary warbler, and rusty blackbird.

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

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

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

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

Normal hydroperiods must be maintained. Somewhat deeper than normal water levels are not likely to do much harm, but extended hydroperiods will limit tree growth and prevent reproduction. Shortened hydroperiods will permit the invasion of mesophytic species, which will change the character of the understory and eventually allow hardwoods to replace cypress. Dome Swamps may also be degraded by pollution and the invasion of exotic plants. Practically all old-growth cypress has been cut; thus, most domes will require long term protection before pre-Columbian conditions are again attained.

(31, 33) Floodplain Forest And Floodplain Swamp. (synonyms: bottomland hardwoods, oak-gum-cypress, elm-ash- cottonwood, seasonally flooded basins or flats, river swamp, river floodplain, slough, oxbow, back swamp, levee, point

bar, river terrace or ridge) Floodplain forests and swamps are characterized as low-lying areas along rivers and large streams that are seasonally inundated by flood waters. Floodplain forests are well-developed hardwood forests with poorly developed understories and sparse, seasonal ground cover. Floodplain swamps are well-developed swamp forests with generally very sparse understories and ground covers. Floodplain forests occur on slight' elevations within the floodplain, while floodplain swamps occur along stream channels and in low spots and oxbows within the floodplain.

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The dominant trees in the floodplain forest are generally mixed mesophytic hardwoods, such as overcup oak, water hickory, diamondleaf oak, and swamp chestnut oak. Other typical plants include bluestem palmetto, willow oak, green ash, Florida elm, sweetgum, hackberry, water oak, American hornbeam, tulip poplar, coastal plain willow, black willow, eastern cottonwood, swamp cottonwood, river birch, red maple, silver maple, box elder American sycamore, catalpa, sweetbay magnolia, hawthorn, wild azalea, greenbriar, poison ivy, peppervine, rattan vine, wild indigo bush, whitegrass, plume grass, redtop panicum, sedges, silverbells, crossvine, American wisteria, and wood grass.

Dominant trees in the floodplain swamps are generally buttressed hydrophytic species, such as cypress and tupelo. Other typical plants include, ogeechee tupelo, water tupelo, swamp titi, wax myrtle, dahoon holly, myrtle-leaved holly, large gallery, possumhaw, buttonbush, male berry, swamp lily, golden club, Southern blue flag, lizard's tail, leather fern, royal fern, marsh fern, soft rush, hazel alder, hawthorn, and swamp privet.

Floodplain forests and swamps harbor a diverse array of animals. Some are temporary residents or are restricted to specific areas within the floodplain, while others are permanent residents of floodplains and similar wetlands. Typical animals include southern dusky salamander, three-salamander, marbled salamander, mole salamander, slimy salamander, dwarf salamander, rusty mud salamander, aiphiui sirens, Alabama waterdog, Southern toad, cricket frog, gray treefrog, bird-voiced treefrog, bullfrog, river frog, southern leopard frog, stinkpot, yellow-belly slider, Florida cooter, alligator, southeastern five-lined skink, broad headed skink, brown water snake, redbelly water snake, mud snake, rainbow snake, black swamp snake, cottonmouth, red-eyed vireo, parula warbler, prothonotary warbler, cardinal, Carolina wren, yellow-crowned night heron, wood duck, red-shouldered hawk, chimney swift, woodcock, barred owl, pileated woodpecker, hairy woodpecker, Swainson's warbler, rufous-sided towhee, swallow-tailed kite, Mississippi kite, Acadian flycatcher, veery, white-eyed vireo, hooded warbler cotton mouse, golden mouse, short-tailed shrew, wood rat, rice rat, southeastern shrew, beaver, bobcat, opossum, raccoon, and bear.

The hydroperiod is the primary physical factor of floodplain forests and swamps. Floodplain forests are inundated by floodwaters nearly every year for 2 - 50% of the growing season. Floodplain swamps are inundated most of the year, drying out only during extended droughts. Swamps along channels are inundated by aerobic (oxygenated) flowing water, while those in sloughs and backswamps experience anaerobic conditions for extensive periods. The seasonal and often prolonged inundations restrict the growth of most shrubs and herbs, leaving most of the ground surface open or thinly mantled with leaf litter. These "pulse" inundations are the "lifeblood" of the floodplain communities. They function to remove detrital buildups, flushing rich organic debris into low spots of the floodplain and into the main river channel where they are then transported downstream to "feed" estuarine communities.

The removal of detritus is offset by the deposition of silts and other sediments, as the lower current velocities through the floodplain communities allow suspended particles to settle. Thus, floodplain forests and swamps are energy-subsidized by seasonal floods, which remove detrital materials and replenish soil minerals and nutrients. Thus, soils of floodplain forests and swamps are variable mixture of sand, organic, and alluvial materials. Some areas within floodplain swamps may have considerable peat accumulations.

Floodplain swamps are often associated with and grade into floodplain forest or hydric hammock, and occasionally baygall. Floodplain forests are often associated with and grade into floodplain swamp, baygall, or slope forest. The species composition of floodplain swamps is frequently similar to that of slough, strand swamp, dome, and basin swamp communities, while the species composition of floodplain forests is frequently similar to that of hydric hammock and bottomland forest communities.

The maintenance of natural hydrological regimes is critical to the health of floodplain forests and swamps. Species composition will be affected if the hydroperiod is significantly altered. Some species that survive well with extended flooding require drydowns for reproduction. Some species look healthy, but do not-grow when constantly inundated. Others may die under these conditions. Contrastingly, several species suffer stress and disease when the water tables are lowered or hydroperiods are shortened. Additionally, shorter hydroperiods and lower water tables allow the survival of upland mesophytic species. Thus, activities that affect the hydrology of floodplain communities, such as dikes, levees, dams, and river channelization, should be strongly discouraged.

Floodplains are dynamic systems subject to drastic rearrangement during flood periods. Thus, facilities should not be planned in these areas, or they should be designed to withstand the tremendous forces of floodwaters. Mature, buttressed and root-entwined trees are important buffers to erosion. Intact floodplain communities also help store flood waters for slower release and thereby reduce the effects of flooding further downstream. For these reasons, timber harvests should not be conducted in the floodplain communities.

(50) Sinkhole Lake. Sinkhole Lakes occur typically in deep, funnel-shaped depressions in a limestone base. Although the depression is relatively permanent, water levels may fluctuate dramatically. These lakes are characterized by clear, alkaline, hard water with high mineral content, including calcium, bicarbonate, and magnesium. Although they occur in most physiographic regions, the major occurrences of this NC in the U.S. are in Florida, where they are moderately widespread in the karst regions. They provide habitat for many species also found in accompanying subterranean NCs. The vegetation in some Sinkhole Lakes may be conspicuously absent or limited to a narrow fringe of emergents at the edge of the water. Other Sinkhole Lakes are completely covered by floating plants. When they occur, typical plants include American cupscale, bog moss, smartweed, rushes, cattails, bladderwort, duckweed, watermeal, azolla, and salvinia. Typical animals include crayfish, isopods, amphipods, pirate perch, redeye chub, yellow bullhead, and mud turtles.

Sinkhole Lakes are considered endangered in Florida. They are threatened by erosion that causes destruction of surrounding vegetation and to pollution and other threats to aquifers with which they are connected.

(55) Spring-Run Stream. (synonyms: calcareous stream, spring, creek, river, or slough). Spring-run streams are characterized as perennial watercourses, which derive most, if not all, of their water from artesian openings in the underground aquifer. Waters issuing from the aquifer are generally clear, circumneutral to slightly alkaline (pH = 7.0 - 8.2), and perennially cool (66 - 75 F = 19 - 25 C). These conditions saturate the water with important minerals, allow light to penetrate deeply, and reduce- the limiting effects of environmental fluctuations, all of which are conducive for plant growth. Thus, spring-run streams are among the most productive aquatic habitats. Typical plants include eel grass, arrowheads, southern naiads, pondweed, and chara. Typical animals include molluscs (*Camyeloma*, *viviparus*, and *Pomacea*), caddisflies, mayflies, chironomids, simuliids, stoneflies, loggerhead musk turtle, Suwannee cooter, rainbow snake, red-bellied watersnake, brown watersnake, American alligator, and alligator snapping turtle, and fresh water fish.

Spring-run streams generally have sand bottoms or exposed limestone along their central channel. Calcareous silts may form thick deposits in quiet shallow zones, while leaf drift and other debris collect around fallen trees and cul de sacs. The latter, along with limestone outcrops and rock debris, form important aquatic habitats for many small aquatic organisms. When undisturbed, submerged aquatic vegetation clothes most of the spring-run stream bottom and provides shelter and an abundant food source for the extensive web of life.

The water emanating from the aquifer is generally clear because of the filtering and absorbing

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FNAI Natural Community Descriptions

actions of the soils and aquifer limestones through which the water percolates and flows. When the water is deep, it may appear bluish because of light-refraction characteristics that are similar to those which cause the sky to be blue on clear days. If the water sources for the aquifer are substantially influenced by nearby swamps or flatwoods, the spring-run may temporarily become stained with tannins and other dissolved organics during or following periods of heavy rains. When extensive underground cavities connect the spring caverns with nearby sinks and swallow holes, the spring run may become turbid with suspended particulates during and following heavy rains and floods. Conversely, during periods of low rainfall, the aquifer can become supersaturated with calcium, carbonates, and other ions. These chemicals readily precipitate when the water reaches the surface, causing the springhead or boil to appear milky.

Water flow rates (i.e., discharge rates) are largely controlled by hydrologic and geologic factors, such as amount and frequency of rainfall in the recharge area, the porosity and permeability of the aquifer limestones, the hydrostatic head (pressure) within the aquifer, and the hydraulic gradient. Thus, flow rates often change substantially with local conditions. In springs that are very near large rivers, the flow may temporarily cease or reverse when they are inundated by floodwaters. In the latter case, the spring temporarily functions as a swallow hole, recharging the aquifer with surface waters.

People can also affect flow rates by withdrawing water from the aquifer through deep wells. When withdrawal is substantial within the recharge area, spring flow is reduced or, in some cases (e.g., Kissengen Springs near Bartow), ceases entirely. Normal flow rates may return when excessive withdrawals are eliminated.

People can also substantially affect the quality of spring waters. Agricultural, residential, and industrial pollutants may readily leach through soils, especially when they are improperly applied or disposed. If polluted groundwater infiltrates the deep aquifer feeding a spring-run stream, recovery may not be possible. Applications of herbicides to control aquatic plant growth are also detrimental, because their use often induces eutrophication of the stream.

Other human-related impacts to spring-run streams include the destruction of aquatic vegetation by overuse or misuse, and the introduction and proliferation of exotic plants and animals. Both of these impacts may be very difficult to control. Overuse is likely to increase because of the limited number of publicly-owned springs and the desires of an increasing population to enjoy their clean, cool, aesthetic qualities and unique recreational opportunities. Exotic species control is complicated because the control measures are often severely detrimental to native species, and they may also disrupt recreational activities. A delicate balance between recreation and preservation must be sought and adhered to.

(79) Aquatic Cave. (synonyms: cave cavern, grotto, chamber, chimney, sink, swallow hole, spring, rise). Aquatic and terrestrial caves are characterized as relatively spacious, underground cavities in karst areas of the state. Terrestrial caves are essentially "dried-out" aquatic caves, as all caves initially develop under aquatic conditions in a loose sense, the limestone aquifers that underlie the entire state of Florida could be considered vast aquatic cave communities. Indeed, the occasional occurrence of various species of troglobites (also called phreatobites) in deep water wells from several regions in the state suggest that this community could be very widespread. However, the apparent dependence of troglobites on detrital inputs and other nutrients imported from the surface generally limits the distribution of well-developed aquatic cave communities to karst areas with numerous surface connections.

The area around cave entrances may be densely vegetated with species typical of sinkhole communities. Within the cave, however, illumination levels and, thereby, vegetation densities drop rapidly with increased distance from the entrance. Within the limits of light penetration, called the

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twilight zone, species of algae, mosses, liverworts, and an occasional fern or herb may grow. Beyond the twilight zone, plants are conspicuously absent, or they are limited to a few inconspicuous species of fungi that grow on guano of other organic debris. Thus, subterranean communities differ from most other communities, in that plants are not dominant elements.

Animals inhabiting subterranean communities are generally classified according to their cave adaptations into three groups: troglloxenes, trogllophiles, and trogllobites. Troglloxenes spend much of their time in caves, but they must periodically return to the surface to feed or breed. Woodrats, harvestmen, cave crickets, some salamanders, and many species of bats are typical examples of troglloxenes. Trogllophiles may regularly live in caves, but their conspecifics also inhabit surface communities with moist microhabitats. Cave orb spiders, some crickets, fish and salamanders are typical examples of trogllophiles. Trogllobites are obligatory cave dwellers with special adaptations for living in complete darkness. Blind cave crayfish, blind cave salamander, cave amphipods, cave shrimp, cave snail, and cave isopods are typical trogllobites in Florida's aquatic caves; while cave mites, some cave spiders and springtails, and a cave earwig are typical trogllobites in some terrestrial caves of North Florida. Even though they never leave their cave environments, trogllobites and trogllophiles depend on outside energy sources, such as detritus that washes in through sinkholes and other cave entrances, and fecal materials derived from troglloxenes which feed outside the cave. Without these energy subsidies, the trogllobitic elements could not exist.

Two geologic processes are predominantly responsible for the development of caves: phreatic and vadose. Phreatic processes occur below the aquifer's surface where ground water is confined and subjected to hydrostatic pressure. Vadose processes occur at the top of or above the aquifer, where air enters the passageways and water flows freely under the influences of gravity. In both processes, the dissolution and corrosion of limestone play active roles in enlarging cave passageways. They differ primarily in the slopes of the passageways which result phreatic passageways being mostly circular or elliptic, and vadose passageways being more triangular with the broad base of the triangle at the bottom. All limestone caves begin development under phreatic conditions in the aquifer. As water tables drop, vadose conditions eventually replace phreatic conditions. If the water table then rose, another reversal of processes would occur. Because water tables have fluctuated substantially with changing sea levels during the Pleistocene and other geologic epochs, most caves in Florida exhibit both phreatic and vadose characteristics.

Because limestone caves initially develop in the aquifer, they are frequently associated with aquifer-related surface features. Thus, a spring-run stream issues from an aquatic cave, while sinkhole lakes and river sinks (swallow holes) lead into aquatic caves. Similarly, terrestrial caves may occur at the bottoms of dry sinkholes or be associated with ancient springs, swallow holes, or aquatic caves that have since been exposed by lowered water tables. Typically, terrestrial caves may also exhibit aquatic conditions during periods of heavy rainfall, or vice versa for aquatic caves during droughts. Additionally, terrestrial caves may harbor relatively permanent pools or lakes that are formed in natural floor depressions from the buildup of rimstone, or where the aquifer inundates the lower cavities. Thus, terrestrial and aquatic caves often occur together.

Cave waters are generally clear to bluish, circumneutral to alkaline waters with high mineral content (particularly calcium, bicarbonate, and magnesium), and relatively constant temperature. Flowing water within aquatic caves generally has a lower pH, is often undersaturated with respect to carbonates, and has a relatively richer fauna. In contrast, pools that are fed by seepage or dripping water are generally characterized by high pH; high concentration of dissolved carbonates, low content of organic matter suitable for food, and a sparse fauna. Cave water characteristics may also vary seasonally, because of fluvial inputs from interconnected surface streams, or because of detrital pulses and other surface inputs during periods of substantial aquifer recharge. In general, however, aquatic caves are very stable environments with relatively constant physical and chemical

characteristics.

Terrestrial caves also are very stable environments, having relatively constant temperatures and humidities. Within the cave, however, these factors may vary with location. For example, the twilight zone is generally warmer and experiences more temperature and humidity fluctuations than does the middle zone, a dark zone that is subject to air circulation due to "cave breathing" phenomena. The deep zone, when it occurs, is the most stable zone of a terrestrial cave, because the air in it is essentially static. Terrestrial cave faunas often partition their general distributions according to these zones, troglloxenes being more common in the twilight and middle zones, and troglobites being more common in the deep zone.

Subterranean communities are extremely fragile communities. Their faunas are adapted to very stable environments and are less able to survive even minor environmental insults. Terrestrial cave communities are threatened by disturbances of spelunkers. The mere entry into a bat roosting, maternity, or hibernation cave is often sufficient to cause abandonment by bats and, thereby, causes a major reduction in an important energy source for the remainder of the cave ecosystem. Alterations in or around cave entrances will often upset detrital input levels and may also induce significant changes in air circulation patterns and the cave microclimate. Aquatic cave communities are threatened by pollution of ground and surface waters from agricultural, industrial, and residential sources, as well as by disturbances from spelunkers and divers. The unique troglobitic species generally have very low population levels and can be severely impacted by overcollection or by changes in nutrient input levels that result from surface manipulations or hydrological alterations. Thus, special precautions and management procedures must be invoked to protect these unique, fragile communities from deleterious activities.

(81, 82) Ruderal And Developed. Ruderal areas are characterized by having the natural substrate or the natural community overwhelmingly altered as a result of human activity. Native vegetation is sparse and is often replaced by weedy or exotic species. These areas require a long-term restoration effort.

Developed areas consist of natural biological communities that have been replaced or nearly replaced by structures or permanently cleared areas such as roads, visitor facilities, campgrounds, recreation areas, parking lots or concessions.

Addendum 5—Plant And Animal List

**Edward Ball Wakulla Springs State Park
Plants**

Common Name	Scientific Name	Primary Habitat Codes (for designated species)
Chives	<i>Aallium schoenoparsum</i>	
Three-seeded mercury	<i>Acalypha gracilens</i>	
Southern red maple	<i>Acer rubrum</i>	
Sugar maple	<i>Acer saccharum</i>	
Red buckeye	<i>Aesculus pavia</i>	
Wild hoarhound	<i>Ageratina aromatica</i>	
Harvest lice	<i>Agrimonia microcarpa</i>	
Ajuga, bugle	<i>Ajuga reptans</i>	
Mimosa*	<i>Albizia julibrissin</i>	
Mushroom sp.	<i>Amanita citrina</i>	
Prince feather	<i>Amaranthus hypocondriacus</i>	
Common ragweed	<i>Ambrosia artemisiifolia</i>	
Pepper vine	<i>Ampelopsis arborea</i>	
Hog peanut	<i>Amphicarpaea bracteata</i>	
Bluestem, broomsedge	<i>Andropogon virginicus</i> var. <i>glaucus</i>	
Dwart snapdragon	<i>Antirrhinum majus</i>	
Marsh parsley	<i>Apium leptophyllum</i>	
Columbine	<i>Aquilegia canadensis</i>	
Devil's-walkingstick	<i>Aralia spinosa</i>	
Green dragon	<i>Arisaema dracontium</i>	
Wiregrass	<i>Aristida stricta</i>	
Snakeroot	<i>Aristolochia serpentaria</i>	
Cane	<i>Arundinaria gigantea</i>	
Milkweed	<i>Asclepias perennis</i>	
Butterfly-weed	<i>Asclepias tuberosa</i>	
Milkweed	<i>Asclepias variegata</i>	
Pawpaw	<i>Asimina longifolia</i> var. <i>spatulata</i>	
Small-fruited pawpaw	<i>Asimina parviflora</i>	
Cast iron plant	<i>Aspidistra elatior</i>	
Ebony spleenwort	<i>Asplenium platyneuron</i>	
Climbing aster	<i>Aster carolinianus</i>	
Aster	<i>Aster sagittifolius</i>	
White-topped aster	<i>Aster tortifolius</i>	
Yellow foxglove	<i>Aureolaria flava</i>	
Mosquito fern	<i>Azolla caroliniana</i>	
Groundsel tree	<i>Baccharis glomesuliflora</i>	
Angel wing begonia	<i>Begonia hybrid 'Lucerna'</i>	
Mixed colors begonia	<i>Begonia semperflorens</i>	
Shrimp plant	<i>Beloperone guttata</i>	
Rattan vine	<i>Berchemia scandens</i>	
Beggar tick	<i>Bidens alba</i>	
Cross vine	<i>Bignonia capreolata</i>	
False nettle	<i>Boehemia cylindrica</i>	
Southern grape fern	<i>Botrychium biternatum</i>	
Rattlesnake fern	<i>Botrychium virginianum</i>	
Sekito ornamental cabbage	<i>Brassica oleracea</i>	
Dwarf curled kale	<i>Brassica oleracea 'Acephala</i>	
Black-haw, gum bumelia	<i>Bumelia lanuginosa</i>	

* Non-native Species

**Edward Ball Wakulla Springs State Park
Plants**

Common Name	Scientific Name	Primary Habitat Codes (for designated species)
Pindo palm	<i>Butia capitata</i>	
American boxwood	<i>Buxus sempervirens</i>	
Fancy-leafed caladium	<i>Caladium bicolor</i>	
Pot marigold	<i>Calendula officinalis</i>	
Beautyberry	<i>Callicarpa americana</i>	
Sweet shrub	<i>Calycanthus floridus</i>	31,33
-----	<i>Calyptocarpus vialis</i>	
Camellia	<i>Camellia japonica</i>	
Camellia sasanqua	<i>Camellia sasanqua</i>	
Trumpet vine	<i>Campsis radicans</i>	
Canna - 4 color varieties	<i>Canna indica</i>	
Sedge	<i>Carex albolutescens</i>	
Sedge	<i>Carex amphibola</i>	
Sedge	<i>Carex cherokeensis</i>	
Sedge	<i>Carex comosa</i>	
Sedge	<i>Carex crus-corvi</i>	
Sedge	<i>Carex digitalis</i>	
Sedge	<i>Carex floridana</i>	
Sedge	<i>Carex gigantea</i>	
Sedge	<i>Carex joori</i>	
Sedge	<i>Carex leptalea</i>	
Sedge	<i>Carex louisianica</i>	
Sedge	<i>Carex lupulina</i>	
Sedge	<i>Carex striatula</i>	
Sedge	<i>Carex texax</i>	
Sedge	<i>Carex tribuloides</i>	
Sedge	<i>Carex willdenowii</i>	
Deer tongue	<i>Carphephorus sp.</i>	
Ironwood	<i>Carpinus caroliniana</i>	
Bitternut hickory	<i>Carya cordiformis</i>	
Pignut hickory	<i>Carya glabra</i>	
Mockernut hickory	<i>Carya tomentosa</i>	
Wild sensitive plant	<i>Cassia nictitans</i>	
Madagascar	<i>Catharanthus</i>	
New Jersey tea	<i>Ceanothus americanus</i>	
Cockcomb	<i>Celosia argentea cristata</i>	
Plumosa, prince feather	<i>Celosia argentea pyramidalis</i>	
Hackberry	<i>Celtis laevigata</i>	
Butterfly-pea	<i>Centrosema virginianum</i>	
Buttonbush	<i>Cephalanthus occidentalis</i>	
Hornwort	<i>Ceratophyllum demersum</i>	
Redbud	<i>Cercis canadensis</i>	
Wild chervil	<i>Chaerophyllum tainturieri</i>	
Spikegrass	<i>Chasmanthium nitidum</i>	
Spikegrass	<i>Chasmanthium sessiliflorum</i>	
Florist chrysanthemum	<i>Chrysanthemum indicum</i>	
Ox-eye daisy	<i>Chrysanthemum leucanthemum</i>	
Water hemlock	<i>Cicuta mexicana</i>	

* Non-native Species

**Edward Ball Wakulla Springs State Park
Plants**

Common Name	Scientific Name	Primary Habitat Codes (for designated species)
Camphor tree*	<i>Cinnamomum camphora</i>	
Thistle	<i>Cirsium horridulum</i>	
Sawgrass	<i>Cladium jamaicense</i>	
Lichen	<i>Cladonia sp.</i>	
Leatherleaf	<i>Clematis crispa linnaeas</i>	
Butterfly pea	<i>Clitoria mariana</i>	
Tread softly	<i>Cnidoscolus stimulosus</i>	
Coralbeads	<i>Cocculus carolinus</i>	
Coleus	<i>Coleus blumei</i>	
Taro*	<i>Colocasia esculenta</i>	
Dayflower	<i>Commelina erecta</i>	
Mist flower	<i>Conoclinium coelestinum</i>	
Tickseed	<i>Coreopsis gladiata</i>	
Lance-leaved coreopsis	<i>Coreopsis lanceolata</i>	
Dogwood	<i>Cornus asperilolia</i>	
Flowering dogwood	<i>Cornus florida</i>	
'Cherokee Princess'	<i>Cornus florida hybrid</i>	
'Cloud 9'	<i>Cornus florida hybrid</i>	
'Plena'	<i>Cornus florida hybrid</i>	
Stiff cornel dogwood	<i>Cornus foemina microcarpa</i>	
Stiff cornel dogwood	<i>Cornus foemina foemina</i>	
Pampas grass	<i>Cortaderia selloana</i>	
Parsley haw	<i>Crataegus marshallii</i>	
Hawthorn	<i>Crataegus pulcherrima</i>	
Dwarf thorn	<i>Crataegus uniflora</i>	
Green haw	<i>Crataegus viridis</i>	
Swamp lily	<i>Crinum americanum</i>	
Milk and wine crinum lily	<i>Crinum powelli</i>	
Star of east	<i>Crocasmia crocosmiiflora</i>	
Crocus	<i>Crocus candidus</i>	
Rabbit-bells	<i>Crotalaria rotundifolia</i>	
Silver croton	<i>Croton argyranthemus</i>	
Rush	<i>Crotonopsis linearis</i>	
Baldwin florsedge	<i>Cyperus globulosus</i>	
Leatherwood	<i>Cyrilla racemiflora</i>	
Wood vamp climbing hydrangea	<i>Decumaria barbara</i>	
Beggar's ticks	<i>Desmodium rotundifolium</i>	
-----	<i>Dichanthelium commutatum</i>	
-----	<i>Dichanthelium dichotomum</i>	
Panic grass	<i>Dichanthelium laxiflorum</i>	
Pony-foot	<i>Dichondra carolinensis</i>	
Poor-Joe	<i>Diodia teres</i>	
Buttonweed	<i>Diodia virginiana</i>	
Yam	<i>Dioscorea villosa</i>	
Persimmon	<i>Diospyros virginiana</i>	
Dwarf sundew	<i>Drosera brevifolia</i>	
Leatherwood fern	<i>Dryopteris ludoviciana</i>	
Indian strawberry	<i>Duchesnia indica</i>	

* Non-native Species

**Edward Ball Wakulla Springs State Park
Plants**

Common Name	Scientific Name	Primary Habitat Codes (for designated species)
Dyschoriste	<i>Dyschoriste oblongifolia</i>	
Purple coneflower	<i>Echinacea purpurea</i>	20,31
Brazilian elodea*	<i>Egeria densa</i>	
Silverthorn elaeagnus	<i>Elaeagnus pungens</i>	
Florida Elephant's-foot	<i>Elephantopus elatus</i>	
Elephant's-foot	<i>Elephantopus carolinianus</i>	
Virginia wild rye	<i>Elymus virginicus</i>	
Green-fly orchid	<i>Epidendrum conopseum</i>	
Beech drops	<i>Epifagus virginiana</i>	
Sugarcane plumegrass	<i>Erianthus giganteus</i>	
White-tops	<i>Erigeron strigosus</i>	
Coralbean	<i>Erythrina herbacea</i>	
Tasmanian blue gum	<i>Eucalyptus globulus</i>	
Cider gum	<i>Eucalyptus gunni</i>	
Strawberry bush	<i>Euonymus americanus</i>	
Aureo-picta euonymus	<i>Euonymus japonica</i>	
White thoroughwort	<i>Eupatorium album</i>	
Dog fennel	<i>Eupatorium capillifolium</i>	
Dog fennel	<i>Eupatorium compositifolium</i>	
Ageratum	<i>Eupatorium incarnatum</i>	
Boneset	<i>Eupatorium perfoliatum</i>	
Spurge	<i>Euphorbia discoidalis</i>	
Spurge	<i>Euphorbia excerta</i>	
American beech	<i>Fagus grandifolia</i>	
Fescue	<i>Festuca optiflora</i>	
White ash	<i>Fraxinus americana</i>	
Popash, Carolina ash	<i>Fraxinus caroliniana</i>	
Green ash	<i>Fraxinus pennsylvanica</i>	
Pumpkin ash	<i>Fraxinus profunda</i>	
Goblin gaillardia	<i>Gaillardia arstata hybrid</i>	
Milk pea	<i>Galactia elliottii</i>	
Wild licorice	<i>Galium circaezans</i>	
Goosegrass	<i>Galium pilosum</i>	
Sweet-scented bedstraw	<i>Galium uniflorum</i>	
Southern gaura	<i>Gaura angustifolia.</i>	
Dangleberry	<i>Gaylussacia frondosa</i>	
Yellow jessamine	<i>Gelsemium sempervirens</i>	
Cranesbill	<i>Geranium carolinianum</i>	
Gerbera daisy	<i>Gerbera jamesonii</i>	
Large-flowered sword lily	<i>Gladiolus sp.</i>	
Water locust	<i>Gleditsia aquatica</i>	
Sweet everlasting	<i>Gnaphalium obtusifolium</i>	
Witch hazel	<i>Hamamelis virginiana</i>	
Mushroom sp.	<i>Hapalopilus croceus</i>	
English ivy*	<i>Hedera helix</i>	
Innocence	<i>Hedyotis procumbens</i>	
Bitter weed	<i>Helenium amarum</i>	
Rockrose	<i>Helianthemum arenicola</i>	

* Non-native Species

**Edward Ball Wakulla Springs State Park
Plants**

Common Name	Scientific Name	Primary Habitat Codes (for designated species)
Annual sunflower	<i>Helianthus annuus</i>	
Rough sunflower	<i>Helianthus hirsutus</i>	
Day lily 'Astec gold'	<i>Hemerocallis fulva</i> var.	
Day lily 'Yellow'	<i>Hemerocallis fulva</i> var.	
Day lily 'Garnet and gold'	<i>Hemerocallis fulva</i> var.	
Spike crested coral root	<i>Hexalectris spicata</i>	
Halberd-leaved marhmallow	<i>Hibiscus militaris</i>	
Rose-of-Sharon	<i>Hibiscus syriacus</i>	
Hawkweed	<i>Hieracium gronovii</i>	
Amaryllis	<i>Hippeastrum equestre</i>	
Dutch hyacinth*	<i>Hyacinthus orientalis</i>	
Hortensia hydrangea	<i>Hydrangea macrophylla</i>	
Oakleaf hydrangea	<i>Hydrangea quercifolia</i>	
Hydrilla*	<i>Hydrilla verticillata</i>	
Swamp pennywort	<i>Hydrocotyle verticillata</i>	
Mushroom sp.	<i>Hygrophores subsordius</i>	
Spider lily	<i>Hymenocallis rotata</i>	
St.Andrew's-cross	<i>Hypericum hypericoides</i>	
Swamp stargrass	<i>Hypoxis leptocarpa</i>	
Mint	<i>Hyptis mutabilis</i>	
Carolina holly	<i>Ilex ambigua</i>	
Dwarf Clarissa holly	<i>Ilex aquifolium hybrid</i>	
Ferox holly	<i>Ilex aquifolium hybrid</i>	
Dahoon holly	<i>Ilex cassine</i>	
Large or sweet gallberry	<i>Ilex coriacea</i>	
Deciduous holly	<i>Ilex decidua</i>	
Inkberry, Gallberry	<i>Ilex glabra</i>	
American holly	<i>Ilex opaca</i>	
Savannah holly	<i>Ilex opaca hybrid</i>	
East Palatka holly	<i>Ilex opaca hybrid</i>	
Yaupon holly	<i>Ilex vomitoria</i>	
Balsam impatiens	<i>Impatiens balsamina</i>	
Busy Lizzy impatiens	<i>Impatiens Wallerana</i>	
Wild potato vine	<i>Ipomoea pandurata</i>	
Cypress vine	<i>Ipomoea quamoclit</i>	
Blue morning glory	<i>Ipomoea trichocarpa</i>	
Virginia willow	<i>Itea virginica</i>	
Rush	<i>Juncus coriaceus</i>	
Shore rush	<i>Juncus marginatus</i>	
Rush	<i>Juncus polycephalus</i>	
Dwarf juniper	<i>Juniperous 'Andora compacta'</i>	
Southern red cedar	<i>Juniperus silicicola</i>	
Spiral juniper	<i>Juniperus 'Torulosa'</i>	
Water willow	<i>Justicia ovata</i>	
Dwarf dandelion	<i>Krigia virginicum</i>	
Blue lettuce	<i>Lactuca floridana</i>	
Crape myrtle	<i>Lagerstroemia indica</i>	
Pinweed	<i>Lechea mucronata</i>	

* Non-native Species

**Edward Ball Wakulla Springs State Park
Plants**

Common Name	Scientific Name	Primary Habitat Codes (for designated species)
Duckweed	<i>Lemna obscura</i>	
Poor man's pepper	<i>Lepidium virginicum</i>	
Bush clover	<i>Lespedeza sp.</i>	
Blazing star	<i>Liatris chapmanii</i>	
Blazing star	<i>Liatris elegans</i>	
Glossy privet*	<i>Ligustrum lucidum</i>	
Golden privet*	<i>Ligustrum ovalifoium</i>	
Spice bush	<i>Lindera benzoin</i>	
Blue toad-flax	<i>Linaria canadensis</i>	
Sweetgum	<i>Liquidambar styraciflua</i>	
Lily turf	<i>Liriope muscari</i>	
Lily turf	<i>Liriope spicata</i>	
Twayblade	<i>Listera australis</i>	
Cardinal flower	<i>Lobelia cardinalis</i>	
Bellflower	<i>Lobelia floridana</i>	
Japanese honeysuckle*	<i>Lonicera japonica</i>	
Coral honeysuckle	<i>Lonicera sempervirens</i>	
Water primrose	<i>Ludwigia repens</i>	
Hurricane lily	<i>Lycoris radiata</i>	
Japanese climbing fern*	<i>Lygodium japonicum</i>	
Staggerbush	<i>Lyonia fruticosa</i>	
Fringed loosestrife	<i>Lysimachia lanceolata</i>	
Southern magnolia	<i>Magnolia grandiflora</i>	
Saucer magnolia	<i>Magnolia soulangiana</i>	
Sweet bay	<i>Magnolia virginiana</i>	
Green adder's-mouth orchid	<i>Malaxis unifolia</i>	31,33
Crab apple	<i>Malus angustifolia</i>	
Angle pod	<i>Matelea gonocarpa</i>	
Mecardonia	<i>Mecardonia acuminata</i>	
Chinaberry*	<i>Melia azedarach</i>	
Melonette	<i>Melothria pendula</i>	
Climbing hempweed	<i>Mikania scandens</i>	
Garden four-o'clock	<i>Mirabilis jalapa</i>	
Partridge berry, twin berry	<i>Mitchella repens</i>	
Miterwort	<i>Mitreola petiolata</i>	
Horse mint	<i>Monarda punctata</i>	
Indian pipe	<i>Monotropa uniflora</i>	
Red mulberry	<i>Morus rubra</i>	
Banana tree	<i>Musa acuminata</i>	
Wax myrtle	<i>Myrica cerifera</i>	
Parrot's-feather*	<i>Myriophyllum brasiliense</i>	
Southern naiad	<i>Najas guadalupensis</i>	
Nandina*	<i>Nandina domestica</i>	
Various cultivars	<i>Narcissus sp.</i>	
Water-cress	<i>Nasturtium microphyllum</i>	
Hurricane lily	<i>Nerine sp.</i>	
Yellow water lily	<i>Nymphaea mexicana</i>	
Swamp tupelo	<i>Nyssa sylvatica var. biflora</i>	

* Non-native Species

**Edward Ball Wakulla Springs State Park
Plants**

Common Name	Scientific Name	Primary Habitat Codes (for designated species)
Cut-leaved evening primrose	<i>Oenothera laciniata</i>	
Star of Bethlehem	<i>Ornithoglossum thyrsoides</i>	
Sensitive fern	<i>Onoclea sensibilis</i>	
Mondo grass*	<i>Ophiopogon japonicus</i>	
Woodsgrass; Basketgrass	<i>Oplismenus setarius</i>	
Prickly-pear cactus	<i>Opuntia humifusa</i>	
Wild olive	<i>Osmanthus americana</i>	
Tea olive	<i>Osmanthus fragrans</i>	
Cinnamon fern	<i>Osmunda cinnamomea</i>	
Royal fern	<i>Osmunda regalis</i>	
Lady's sorrel	<i>Oxalis corniculata</i>	
Lady's sorrel	<i>Oxalis dillenii</i>	
Maidencane	<i>Panicum hemitomon</i>	
Blackberry lily hybrid	<i>Paradancana norrissii hybrid</i>	
Whitlow-wort	<i>Paronychia baldwinii</i>	
Virginia creeper	<i>Parthenocissus quinquefolia</i>	
Thin paspalum	<i>Paspalum setaceum</i>	
Passionflower	<i>Passiflora incarnata</i>	
Yellow passion flower	<i>Passiflora lutea</i>	
Geranium	<i>Pelargonium hortorum hybrid</i>	
Redbay	<i>Persea borbonia</i>	
Swampbay	<i>Persea palustris</i>	
Parsley	<i>Petroselinum crispum</i>	
Garden petunia	<i>Petunia hybrida</i>	
Bean vine, wild bean	<i>Phaseolus polystachyus</i>	
Florida phlox	<i>Phlox floridana</i>	
Mistletoe	<i>Phoradendron serotinum</i>	
Red-leaf photinia	<i>Photinia glabra</i>	
-----	<i>Phyllanthus urinaria</i>	
Ground cherry	<i>Physalis sp.</i>	
Obedient plant	<i>Physostegia leptophylla</i>	
Pokeberry; Pokeweed	<i>Phytolacca americana</i>	
Shortleaf pine	<i>Pinus echinata</i>	
Slash pine	<i>Pinus elliottii</i>	
Spruce pine	<i>Pinus glabra</i>	
Longleaf pine	<i>Pinus palustris</i>	
Loblolly pine	<i>Pinus taeda</i>	
Piriqueta	<i>Piriqueta caroliniana</i>	
Japanese pittosporum*	<i>Pittosporum tobira</i>	
Variegated pittosporum	<i>Pittosporum tobira var.</i>	
Golden aster	<i>Pityopsis sp.</i>	
Hoary plantain	<i>Plantago virginica</i>	
Little club-spur orchid	<i>Platanthera clavellata</i>	31,33
Southern rein-orchid	<i>Platanthera flava</i>	
Marsh fleabane, camphor weed	<i>Pluchea camphorata</i>	
Annual bluegrass	<i>Poa annua</i>	
Yew podocarpus	<i>Podocarpus macrophylla</i>	
Polygala	<i>Polygala grandiflora</i>	

* Non-native Species

**Edward Ball Wakulla Springs State Park
Plants**

Common Name	Scientific Name	Primary Habitat Codes (for designated species)
Bachelor button	<i>Polygala nana</i>	
Wild water-pepper	<i>Polygonum hydropiperoides</i>	
Pinkweed	<i>Polygonum pensylvanicum</i>	
Smartweed	<i>Polygonum sp.</i>	
Resurrection fern	<i>Polypodium polypodioides</i>	
Rustweed	<i>Polypremum procumbens</i>	
Christmas fern	<i>Polystichum acrostichoides</i>	
Pickernelweed	<i>Pontederia cordata</i>	
Shadow witch orchid	<i>Pontheiva racemosa</i>	
Cottowood	<i>Populus deltoides</i>	
Purslane rose	<i>Portulaca sp.</i>	
Illinois pondweed	<i>Potamogeton illinoensis</i>	
Gall-of-the-earth	<i>Prenanthes serpentaria</i>	
Wildplum	<i>Prunus americana</i>	
Carolina laurel cherry	<i>Prunus caroliniana</i>	
Wild cherry	<i>Prunus serotina</i>	
Ornamental cherry	<i>Prunus sp.</i>	
Hog plum	<i>Prunus umbellata</i>	
Bracken fern	<i>Pteridium aquilinum</i>	
Mock bishop's weed	<i>Ptilimnium capillaceum</i>	
Firethorn	<i>Pyracantha coccinea</i>	
False dandelion	<i>Pyrrhopappus carolinianus</i>	
White oak	<i>Quercus alba</i>	
Bluff oak	<i>Quercus austrina</i>	
Southern red oak	<i>Quercus falcata</i>	
Laurel oak	<i>Quercus hemisphaerica</i>	
Bluejack oak	<i>Quercus incana</i>	
Turkey oak	<i>Quercus laevis</i>	
Diamond oak	<i>Quercus margaretta</i>	
Swamp chestnut oak	<i>Quercus michauxii</i>	
Dwarf live oak	<i>Quercus minima</i>	
Water oak	<i>Quercus nigra</i>	
Runner oak	<i>Quercus pumila</i>	
Live oak	<i>Quercus virginiana</i>	
Pale meadow beauty	<i>Rhexia mariana</i>	
Meadow beauty	<i>Rhexia petiolata</i>	
Azalea - Southern Indian hybrids	<i>Rhododendron indicum</i>	
Azalea - Kurume hybrids	<i>Rhododendron obtusum</i>	
Swamp honeysuckle	<i>Rhododendron serrulatum</i>	
Winged sumac	<i>Rhus copallina</i>	
Rhynchosia	<i>Rhynchosia difformis</i>	
Dollarleaf	<i>Rhynchosia reniformis</i>	
Beakrush	<i>Rhynchospora caduca</i>	
Beakrush	<i>Rhynchospora microcarpa</i>	
Beakrush	<i>Rhynchospora mixta</i>	
Ornamental rose	<i>Rosa hybrids</i>	
Swamp rose	<i>Rosa palustris</i>	
Rosemary	<i>Rosmarinus officinalis</i>	

* Non-native Species

Edward Ball Wakulla Springs State Park
Plants

Common Name	Scientific Name	Primary Habitat Codes (for designated species)
Highbush blackberry	<i>Rubus argutus</i>	
Sand blackberry	<i>Rubus cuneifolius</i>	
Dewberry	<i>Rubus trivialis</i>	
Black-eyed susan	<i>Rudbeckia hirta</i>	
Wild petunia	<i>Ruellia caroliniensis</i>	
Sourdock	<i>Rumex hastatulus</i>	
Dwarf palmetto	<i>Sabal minor</i>	
Cabbage palm	<i>Sabal palmetto</i>	
White sabatia	<i>Sabatia brevifolia</i>	
Swamp pink	<i>Sabatia calycina</i>	
Pearlwort	<i>Sagina decumbens</i>	
Eel grass	<i>Sagittaria kurziana</i>	
Arrowhead	<i>Sagittaria lancifolia</i>	
Carolina willow	<i>Salix caroliniana</i>	
Lyre-leaved sage	<i>Salvia lyrata</i>	
Perennial blue sage	<i>Salvia sp.</i>	
Pineland pimperel	<i>Samolus parviflorus</i>	
Black snakeroot	<i>Sanicula canadensis</i>	
Sassafras	<i>Sassafras albidum</i>	
Lizard's tail	<i>Saururus cernuus</i>	
Sensitive brier	<i>Schrankia microphylla</i>	
Bulrush	<i>Scirpus lineatus</i>	
Nutrush	<i>Scleria oligantha</i>	
Nutrush	<i>Scleria triglomerata</i>	
Skullcap	<i>Scutellaria integrifolia</i>	
Sebastian bush	<i>Sebastiania fruticosa</i>	
Dusty miller	<i>Senecio cineraria</i>	
Butter weed	<i>Senecio glabellus</i>	
Saw palmetto	<i>Serenoa repens</i>	
Knotroot	<i>Setaria geniculata</i>	
Purple heart	<i>Setcreasea purpurea</i>	
Indian hemp	<i>Sida rhombifolia</i>	
Rosinweed	<i>Silphium simpsonii</i>	
Water parsnip	<i>Sium suave</i>	
Greenbrier	<i>Smilax auriculata</i>	
Catbrier	<i>Smilax bona-nox</i>	
Greenbrier	<i>Smilax ecirrhata</i>	
Wild sarsaparilla	<i>Smilax glauca</i>	
Sarsaparilla vine	<i>Smilax pumila</i>	
Jackson-brier	<i>Smilax smallii</i>	
Greenbrier	<i>Smilax tamnoides</i>	
Coral greenbrier	<i>Smilax walteri</i>	
Horse nettle	<i>Solanum carolinense var. floridanum</i>	
Goldenrod	<i>Solidago canadensis var. scabra</i>	
Sweet goldenrod	<i>Solidago odora</i>	
Prairie wedgescale	<i>Sphenopholis obtusata</i>	
Indian pink	<i>Spigelia marilandica</i>	
-----	<i>Spilanthes americana</i>	

* Non-native Species

**Edward Ball Wakulla Springs State Park
Plants**

Common Name	Scientific Name	Primary Habitat Codes (for designated species)
Nodding ladies'-tresses	<i>Spiranthes odorata</i>	
Little ladies'-tresses	<i>Spiranthes tuberosa</i>	
Bridalwreath	<i>Spireae arguta</i>	
Mushroom sp.	<i>Stereum ostrim</i>	
Queen's delight	<i>Stillingia sylvatica</i>	20,22
Black cat grass	<i>Stipa avenacea</i>	
Stoke's aster	<i>Stokesia laevis</i>	
Stylisma	<i>Stylisma humistrata</i>	
Stylodon	<i>Stylodon careus</i>	
Horse sugar, sweetleaf	<i>Symplocos tinctoria</i>	
Bald cypress	<i>Taxodium distichum</i>	
Hoary pea	<i>Tephrosia spicata</i>	
Rice-paper plant	<i>Tetrapanax papyriferus</i>	
Wood fern, southern shield fern	<i>Thelypteris kunthii</i>	
Basswood	<i>Tilia americana</i>	
Spanish moss	<i>Tillandsia usneoides</i>	
Crane-fly orchid	<i>Tipularia discolor</i>	
Poison ivy	<i>Toxicodendron radicans</i>	
Climbing dogbane	<i>Trachelospermum difforme</i>	
Windmill palm	<i>Trachycarpus fortunei</i>	
Tragia	<i>Tragia urens</i>	
Mushroom sp.	<i>Tricholoma sp.</i>	
Tall redtop	<i>Tridens flavus</i>	
Carolina clover	<i>Trifolium carolinianum</i>	
Red trillium	<i>Trillium sessile</i>	
Venus' looking-glass	<i>Triodanis biflora</i>	
Venus' looking-glass	<i>Triodanis perfoliata</i>	
Cattail	<i>Typha sp.</i>	
Winged elm	<i>Ulmus alata</i>	
American elm	<i>Ulmus americana var. floridana</i>	
Sparkleberry	<i>Vaccinium arboreum</i>	
Highbush blueberry	<i>Vaccinium corymbosum</i>	
Blueberry	<i>Vaccinium darrowii</i>	
Elliott blueberry	<i>Vaccinium elliotii</i>	
Shiny blueberry	<i>Vaccinium myrsinites</i>	
Deerberry	<i>Vaccinium stamineum</i>	
Eelgrass	<i>Vallisneria americana</i>	
Verbena	<i>Verbena brasilienses</i>	
Ironweed	<i>Vernonia angustifolia var. mohrii</i>	
Southern arrow-wood	<i>Viburnum dentatum</i>	
Possum haw	<i>Viburnum nudum</i>	
Walter viburnum	<i>Viburnum obovatum</i>	
Rusty haw, southern black haw	<i>Viburnum rufidulum</i>	
Violet	<i>Viola affinis</i>	
Violet	<i>Viola esculenta</i>	
Florida violet	<i>Viola floridana</i>	
Violet	<i>Viola septemloba</i>	
Violet	<i>Viola walteri</i>	

* Non-native Species

**Edward Ball Wakulla Springs State Park
Plants**

Common Name	Scientific Name	Primary Habitat Codes (for designated species)
Garden pansy	<i>Viola wittrockiana</i>	
Summer grape	<i>Vitis aestivalis</i>	
Downy grape	<i>Vitis cinerea</i> var. <i>floridana</i>	
Muscadine grape	<i>Vitis rotundifolia</i>	
Frost grape	<i>Vitis vulpina</i>	
Voehmena	<i>Voehmena cylindrica</i>	
American wisteria	<i>Wisteria frutescens</i>	
Chinese wisteria*	<i>Wisteria sinensis</i>	
Virginia chain fern	<i>Woodwardia virginica</i>	
Bear grass, weak-leaf yucca	<i>Yucca flaccidailamentosa</i>	
Atamasco lily	<i>Zephyranthes atamasco</i>	
Dreamland coral zinnia	<i>Zinnia elegans</i> hybrid	
Indian rice	<i>Zizania aquatica</i>	

* Non-native Species

**Edward Ball Wakulla Springs State Park
Animals**

Common Name	Scientific Name	Primary Habitat Codes (for all species)
MOLLUSKS		
Clam	<i>Elliptio jayensis</i>	55
Snail	<i>Helisoma duryi</i>	55
Ram's-horn Snail	<i>Goniobasis floridense</i>	55
Apple Snail	<i>Pomacea paludosa</i>	55
ANNELIDA		
Earthworm	<i>Lumbricus terrestris</i>	20,30,31,33
ARTHROPODS		
Black Widow Spider	<i>Latrodectus mactans</i>	20,30,31,33
Crab-like Spiny Orb Weaver	<i>Gasteracantha cancriformis</i>	20,30,31,33
Golden-silk Spider	<i>Nephila clavipes</i>	20,30,31,33
Carolina Wolf Spider	<i>Lycosa carolinensis</i>	20,22,30,31,33
Daddy-long-legs	<i>Leiobunum sp.</i>	Throughout
Deer Tick	<i>Ixodes scapularis</i>	Throughout
Cave Isopod	<i>Adellus sp. (undescribed)</i>	79
Woodville Karst Cave Crayfish	<i>Procambarus orcinus</i>	79
Big Blue Spring Cave Crayfish	<i>Procambarus horsti</i>	79
Blue Crab	<i>Callinectes sapidus</i>	55
Hobbs' Cave Amphipod	<i>Crangonyx hobbsi</i>	79
Florida Cave Amphipod	<i>Crangonyx grandimanus</i>	79
Cave Amphipod	<i>Crangonyx floridanus</i>	79
Amphipod	<i>Crangonyx hobbsi</i>	79
Swimming Little Florida Cave Isopod	<i>Remasellus parvus</i>	79
Ebony Jewelwing Damselfly	<i>Calopteryx maculata</i>	55
Orange Bluet Damselfly	<i>Enallagma signatum</i>	55
Other Damselflies Sp.	<i>Calopteryx dimidiata</i>	55
	<i>Hetaerina titia</i>	55
	<i>Lestes disjunctus australis</i>	55
	<i>Lestes vigilax</i>	55
	<i>Argia fumipennis atra</i>	55
	<i>Argia moesta</i>	55
	<i>Argia sedula</i>	55
	<i>Argia tibialis</i>	55
	<i>Enallagma cardenium</i>	55
	<i>Enallagma civile</i>	55
	<i>Enallagma concisum</i>	55
	<i>Enallagma daeckei</i>	55
	<i>Enallagma dubium</i>	55
	<i>Enallagma durum</i>	55
	<i>Enallagma geminatum</i>	55
	<i>Enallagma pallidum</i>	55
	<i>Enallagma pollutum</i>	55
	<i>Enallagma vesperum</i>	55
	<i>Enallagma weewa</i>	55

Edward Ball Wakulla Springs State Park
Animals

Common Name	Scientific Name	Primary Habitat Codes (for all species)
	<i>Ischnura hastata</i>	55
	<i>Ischnura kellicotti</i>	55
	<i>Ischnura posita</i>	55
	<i>Ischnura prognata</i>	55
	<i>Ischnura ramburii</i>	55
	<i>Nehalennia integrigollis</i>	55
	<i>Telebasis byersi</i>	55
Common Green-darter		
Dragonfly	<i>Anax junius</i>	Throughout
Regal Darner Dragonfly	<i>Coryphaeschna ingens</i>	Throughout
Palmetto Walkingstick	<i>Anismorpha buprestoides</i>	Throughout
Southeastern Lubber		
Grasshopper	<i>Romalea microptera</i>	Throughout
Broad-winged Katydid	<i>Microcentrum rhombifolium</i>	Throughout
House Cricket	<i>Acheta domestica</i>	Throughout
Field Cricket	<i>Gryllus pennsylvanicus</i>	Throughout
Northern Mole Cricket	<i>Gryllotalpa hexadactyla</i>	Throughout
Carolina Mantid Praying Mantis	<i>Stagmomantis carolina</i>	Throughout
American Cockroach	<i>Periplaneta americana</i>	Throughout
German Cockroach	<i>Blattella germanica</i>	Throughout
Eastern Subterranean termite	<i>Reticulitermis flavipes</i>	Throughout
Common Water Strider	<i>Gerris remigis</i>	55
Leaf-footed Bug	<i>Acanthocephala femorata</i>	55
Black Turpentine Beetle	<i>Dendroctonus terebrans</i>	20,22
Ips Engraver Beetle	<i>Ips sp.</i>	20,22
Green June Beetle	<i>Cotinus nitida</i>	30,31,33
Two-spotted Lady Beetle	<i>Adalia bipunctata</i>	Throughout
Pyrallis Firefly	<i>Photinus pyralis</i>	Throughout
Pipevine Swallowtail Butterfly	<i>Battus philenor</i>	Throughout
Zebra Swallowtail Butterfly	<i>Eurytides marcellus</i>	Throughout
Black Swallowtail Butterfly	<i>Papilio polyxenes</i>	Throughout
Giant Swallowtail Butterfly	<i>Papilio cresphontes</i>	Throughout
Eastern Tiger Swallowtail	<i>Papilio glaucus</i>	Throughout
Spicebush Swallowtail Butterfly	<i>Papilio troilus</i>	Throughout
Palamedes Swallowtail Butterfly	<i>Papilio palamedes</i>	Throughout
Orange Sulphur Butterfly	<i>Colias eurytheme</i>	Throughout
Cloudless Sulphur Butterfly	<i>Phoebis sennae</i>	Throughout
Little Yellow Butterfly	<i>Eurema lisa</i>	Throughout
Sleepy Orange Butterfly	<i>Eurema nicippe</i>	Throughout
Gray Hairstreak Butterfly	<i>Strymon melinus</i>	Throughout
Red-banded Hairstreak Butterfly	<i>Calycopis cecrops</i>	Throughout
Gulf Fritillary Butterfly	<i>Agraulis vanillae</i>	Throughout
Variegated Fritillary Butterfly	<i>Euptoieta claudia</i>	Throughout
Zebra Butterfly	<i>Heliconius charithonius</i>	Throughout
Phaon Crescent Butterfly	<i>Phycoides phaon</i>	Throughout
Texan Crescent Butterfly	<i>Phycoides texana</i>	Throughout
Pearl Crescent Butterfly	<i>Phycoides tharos</i>	Throughout
Common Buckeye Butterfly	<i>Junonia coenia</i>	Throughout

* Non-native Species

**Edward Ball Wakulla Springs State Park
Animals**

Common Name	Scientific Name	Primary Habitat Codes (for all species)
Red-spotted Purple Butterfly	<i>Limenitis arthemis</i>	Throughout
Viceroy Butterfly	<i>Limenitis archippus</i>	Throughout
Southern Pearly-eye Butterfly	<i>Enodia portlandia</i>	Throughout
Appalachian Satyre Butterfly	<i>Satyrodes appalachia</i>	Throughout
Carolina Satyre Butterfly	<i>Hermeuptychia sosybius</i>	Throughout
Gemmed Satyre Butterfly	<i>Cyllopsis gemma</i>	Throughout
Little Wood Satyre Butterfly	<i>Megisto cymela</i>	Throughout
Monarch Butterfly	<i>Danaus plexippus</i>	Throughout
Queen Butterfly	<i>Danaus gilippus</i>	Throughout
Silver-spotted Skipper	<i>Epargyreus clarus</i>	Throughout
Long-tailed Skipper	<i>Urbanus proteus</i>	Throughout
Whirlabout Skipper	<i>Polites vibex</i>	Throughout
Lace-winged Roadside Skipper	<i>Amblyscirtes aesculapius</i>	Throughout
Fiery Skipper	<i>Hylephila phyleus</i>	Throughout
Common Checkered Skipper	<i>Pyrgus communis</i>	Throughout
Least Skipper	<i>Ancyloxypha numitor</i>	Throughout
Deer Fly	<i>Chrysops sp.</i>	Throughout
Black Horse Fly	<i>Tabanus atratus</i>	Throughout
House Fly	<i>Musca domestica</i>	Throughout
Love Bug	<i>Plecia nearctica</i>	Throughout
Summer Mosquitoes	<i>Aedes sp.</i>	Throughout
House Mosquitoes	<i>Culex pipiens</i>	Throughout
Cow Killer "Velvet Ant"	<i>Dasymutilla occidentalis</i>	20,22
Red Fire Ant	<i>Solenopsis invicta</i>	20,22
Eastern Yellow Jacket	<i>Vespula maculifrons</i>	20,22
Honey Bee	<i>Apis mellifera</i>	Throughout
American Bumble Bee	<i>Bombus pennsylvanicus</i>	Throughout
Oak Gallmaking Cynipids	<i>Amphibolips quercusracemaria</i>	20,22
	<i>Andricus quercusfoliatus</i>	20,22
	<i>Andricus quercuspetiolicola</i>	20,22
	<i>Belonocnema quercussvirens</i>	20,22
	<i>Callirhytis cornigera</i>	20,22
	<i>Callirhytis quercusbatatoides</i>	20,22
	<i>Callirhytis quercusrugosa</i>	20,22
	<i>Callirhytis quercusventricosa</i>	20,22
	<i>Callirhytis seminator</i>	20,22
	<i>Dryocosmus nova</i>	20,22
	<i>Dryocosmus quercuslaurifoliae</i>	20,22
	<i>Dryocosmus quercusnotha</i>	20,22
	<i>Disholcaspis quercusglobulus</i>	20,22
	<i>Disholcaspis quercussuccinipes</i>	20,22
	<i>Disholcaspis quercusvirens</i>	20,22
	<i>Neuroterus nova</i>	20,22
	<i>Neuroterus quercusbatatus</i>	20,22
	<i>Xystoteras sp.</i>	20,22

FISH

Shad	<i>Alosa alabamae</i>	55
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* Non-native Species

Edward Ball Wakulla Springs State Park
Animals

Common Name	Scientific Name	Primary Habitat Codes (for all species)
Bowfin	<i>Amia calva</i>	55
American Eel	<i>Anguilla rostrata</i>	55
Pirate Perch	<i>Aphredoderus sayanus</i>	55
Sheepshead	<i>Archosargus probatocephalus</i>	55
Flier	<i>Centrarchus macropterus</i>	55
Sheepshead Minnow	<i>Cyprinodon variegatus</i>	55
Gizzard Shad	<i>Dorosoma cepedianum</i>	55
Everglades Pygmy Sunfish	<i>Elassoma evergladei</i>	55
Okefenokee Pygmy Sunfish	<i>Elassoma okefenokee</i>	55
Banded Pygmy Sunfish	<i>Elassoma zonatum</i>	55
Bluespotted Sunfish	<i>Enneacanthus gloriosus</i>	55
Lake Chubsucker	<i>Erimyzon sucetta</i>	55
Redfin Pickerel	<i>Esox americanus</i>	55
Swamp Darter	<i>Etheostoma fusiforme</i>	55
Golden Topminnow	<i>Fundulus chrysotus</i>	55
Eastern Starhead Topminnow	<i>Fundulus escambia</i>	55
Seminole Killifish	<i>Fundulus seminolis</i>	55
Mosquitofish	<i>Gambusia holbrooki</i>	55
Least Killifish	<i>Heterandria formosa</i>	55
White Catfish	<i>Ictalurus catus</i>	55
Yellow Bullhead	<i>Ictalurus natalis</i>	55
Brown Bullhead	<i>Ictalurus nebulosus</i>	55
Channel Catfish	<i>Ictalurus punctatus</i>	55
Flagfish	<i>Jordanella floridae</i>	55
Brook Silverside	<i>Labidesthes sicculus</i>	55
Longnose Gar	<i>Lepisosteus osseus</i>	55
Florida Gar	<i>Lepisosteus platyrhincus</i>	55
Redbreast Sunfish	<i>Lepomis auritus</i>	55
Warmouth	<i>Lepomis gulosus</i>	55
Bluegill	<i>Lepomis macrochirus</i>	55
Dollar Sunfish	<i>Lepomis marginatus</i>	55
Redear Sunfish	<i>Lepomis microlophus</i>	55
Spotted Sunfish	<i>Lepomis punctatus</i>	55
Pygmy Killifish	<i>Leptolucania ommata</i>	55
Bluefin Killifish	<i>Lucania goodei</i>	55
Largemouth Bass	<i>Micropterus salmoides</i>	55
Spotted Sucker	<i>Minytrema melanops</i>	55
Striped Mullet	<i>Mugil cephalus</i>	55
Golden Shiner	<i>Notomigonus crysoleucas</i>	55
Ironcolor Shiner	<i>Notropis chalybaeus</i>	55
Dusky Shiner	<i>Notropis cummingsae</i>	55
Pugnose Minnow	<i>Notropis emiliae</i>	55
Redeye Chub	<i>Notropis harperi</i>	55
Sailfin Shiner	<i>Notropis hypselopterus</i>	55
Coastal Shiner	<i>Notropis petersoni</i>	55
Tadpole Madtom	<i>Noturus gyrinus</i>	55
Speckled Madtom	<i>Noturus leptacanthus</i>	55
Blackbanded Darter	<i>Percina nigrofasciata</i>	55

* Non-native Species

Edward Ball Wakulla Springs State Park

Animals

Common Name	Scientific Name	Primary Habitat Codes (for all species)
Sailfin Molly	<i>Poecilia latipinna</i>	55
Black Crappie	<i>Pomoxis nigromaculatus</i>	55
Hogchoker	<i>Trinectes maculatus</i>	55
AMPHIBIANS		
Slimy Salamander	<i>Plethodon glutinosus</i>	30,31,33
Eastern Narrow-mouthed Toad	<i>Gastrophryne carolinensis</i>	20,22
Eastern Spadefoot Toad	<i>Scaphiopus holbrookii</i>	20,22
Fowlers Toad	<i>Bufo woodhousei fowleri</i>	20,22
Gray Teefrog	<i>Hyla chrysoscelis</i>	30,31,33
Green Treefrog	<i>Hyla cinerea</i>	30,31,33
Spring Peeper	<i>Hyla crucifer</i>	30,31,33
Pinewoods Treefrog	<i>Hyla femoralis</i>	20,22
Squirrel Treefrog	<i>Hyla squirella</i>	20,22
Bull Frog	<i>Rana catesbeiana</i>	30,31,33
Pig Frog	<i>Rana grylio</i>	30,31,33
Southern Leopard Frog	<i>Rana utricularia</i>	30,31,33
Southern Toad	<i>Bufo terrestris</i>	20,22
Siren	<i>Siren sp.</i>	30,31,33

**Edward Ball Wakulla Springs State Park
Animals**

Common Name	Scientific Name	Primary Habitat Codes (for all species)
REPTILES		
Florida Snapping Turtle	<i>Chelydra serpentina</i>	33,55
Suwannee Cooter	<i>Chrysemys concinna suwanniensis</i>	33,55
Gopher Tortoise	<i>Gopherus polyphemus</i>	22
Eastern Mud Turtle	<i>Kinosternon subrubrum</i>	33,55
Alligator Snapping Turtle	<i>Macrochelys temminckii</i>	33,55
River Cooter	<i>Pseudemys concinna</i>	33,55
Florida Cooter	<i>Pseudemys floridana</i>	33,55
Stinkpot	<i>Sternotherus odoratus</i>	33,55
Gulf Coast Box Turtle	<i>Terrapene carolina major</i>	20,22,31
Yellow-bellied Slider	<i>Trachemys scripta</i>	33,55
Florida Softshell Turtle	<i>Trionyx ferox</i>	33,55
American Alligator	<i>Alligator mississippiensis</i>	33,55
Green Anole	<i>Anolis carolinensis</i>	Throughout
Fence Lizard	<i>Sceloporus undulatus hyacinthinus</i>	20,22
Six-lined Racerunner	<i>Cnemidophorus sexlineatus</i>	20,22
Eastern Glass Lizard	<i>Ophisaurus ventralis</i>	20,22
Broad-headed Skink	<i>Eumeces laticeps</i>	20,31
Southeastern Five-lined Skink	<i>Eumeces inexpectatus</i>	20,22,31
Ground Skink	<i>Scincella laterale</i>	20,22
Eastern Cottonmouth	<i>Agkistrodon piscivorus</i>	30,31,33
Black Racer	<i>Coluber constrictor</i>	20,22
Eastern Diamondback Rattlesnake	<i>Crotalus adamanteus</i>	20,22
Dusky Pigmy Rattlesnake	<i>Sistrurus miliarius barbouri</i>	20,22
Ring-necked Snake	<i>Diadophis punctatus</i>	20,22,31
Scarlet Snake	<i>Cemophora coccinea</i>	20,22,31
Scarlet King Snake	<i>Lampropeltis triangulum</i>	20,22,31
Red Rat Snake	<i>Elaphe guttata</i>	20,31,33
Gray Rat Snake	<i>Elaphe obsoleta spiloides</i>	20,31,33
Eastern Hognose	<i>Heterodon platyrhinos</i>	20,22
Eastern Kingsnake	<i>Lampropeltis getulus</i>	20,22,31,33
Coachwhip	<i>Masticophis flagellum</i>	20,22
Coral Snake	<i>Micrurus fulvius</i>	20,22,31
Southern Watersnake	<i>Nerodia fasciata</i>	30,33,55
Brown Watersnake	<i>Nerodia taxispilota</i>	30,33,55
Red-bellied Watersnake	<i>Natrix erythrogaster</i>	30,33,55
Banded Watersnake	<i>Natrix fasciata</i>	30,33,55
Rough Green Snake	<i>Opheodrys aestivus</i>	31,33
Pine Snake	<i>Pituophis melanoleucus</i>	20,22
Eastern Garter Snake	<i>Thamnophis sirtalis</i>	20,30,31,33
BIRDS		
Common Loon	<i>Gavia immer</i>	55
Pied-billed Grebe	<i>Podilymbus podiceps</i>	55
Horned Grebe	<i>Podiceps auritus</i>	55
Great Cormorant	<i>Phalacrocorax carbo</i>	55

Edward Ball Wakulla Springs State Park
Animals

Common Name	Scientific Name	Primary Habitat Codes (for all species)
Double-crested Cormorant	<i>Phalacrocorax auritus</i>	55
Anhinga	<i>Anhinga anhinga</i>	55
Great Blue Heron	<i>Ardea herodias</i>	55
Great Egret	<i>Ardea alba</i>	55
Snowy Egret	<i>Egretta thula</i>	55
Little Blue Heron	<i>Egretta caerulea</i>	55
Tricolored Heron	<i>Egretta tricolor</i>	55
Green Heron	<i>Butorides virescens</i>	55
Black-crowned Night-Heron	<i>Nycticorax nycticorax</i>	55
Yellow-crowned Night-Heron	<i>Nycticorax violaceus</i>	
White Ibis	<i>Eudocimus albus</i>	55
Roseate Spoonbill	<i>Ajaia ajaja</i>	55
Wood Stork	<i>Mycteria americana</i>	55
Black Vulture	<i>Coragyps atratus</i>	Throughout
Turkey Vulture	<i>Cathartes aura</i>	Throughout
Wood Duck	<i>Aix sponsa</i>	33,55
Green-winged Teal	<i>Anas crecca</i>	55
American Black Duck	<i>Anas rubripes</i>	55
Mallard	<i>Anas platyrhynchos</i>	55
Blue-winged Teal	<i>Anas discors</i>	55
Northern Shoveler	<i>Anas clypeata</i>	55
Gadwall	<i>Anas strepera</i>	55
Eurasian Wigeon	<i>Anas penelope</i>	55
American Wigeon	<i>Anas americana</i>	55
Canvasback	<i>Aythya valisineria</i>	55
Redhead	<i>Aythya americana</i>	55
Ring-necked Duck	<i>Aythya collaris</i>	55
Greater Scaup	<i>Aythya marila</i>	55
Lesser Scaup	<i>Aythya affinis</i>	55
Common Goldeneye	<i>Bucephala clangula</i>	55
Hooded Merganser	<i>Lophodytes cucullatus</i>	55
Red-breasted Merganser	<i>Mergus serrator</i>	55
Osprey	<i>Pandion haliaetus</i>	33,55
Swallow-tailed Kite	<i>Elanoides forficatus</i>	Throughout
Snail Kite	<i>Rostrhamus sociabilis</i>	55
Mississippi Kite	<i>Ictinia mississippiensis</i>	Throughout
Bald Eagle	<i>Haliaeetus leucocephalus</i>	Throughout
Northern Harrier	<i>Circus cyaneus</i>	55
Sharp-shinned Hawk	<i>Accipiter striatus</i>	Throughout
Copper's Hawk	<i>Accipiter cooperii</i>	20,22,31,33
Red-shouldered Hawk	<i>Buteo lineatus</i>	20,22,31,33
Broad-winged Hawk	<i>Buteo platypterus</i>	20,22,31,33
Red-tailed Hawk	<i>Buteo jamaicensis</i>	20,22,31,33
Golden Eagle	<i>Aquila chrysaetos</i>	OF
American Kestrel	<i>Falco sparverius</i>	20,22
Merlin	<i>Falco columbarius</i>	22
Peregrine Falcon	<i>Falco peregrinus</i>	20,22
Wild Turkey	<i>Meleagris gallopavo</i>	20,22,31,33

* Non-native Species

Edward Ball Wakulla Springs State Park
Animals

Common Name	Scientific Name	Primary Habitat Codes (for all species)
Northern Bobwhite	<i>Colinus virginianus</i>	20,22
Sora	<i>Porzana carolina</i>	31,33,55
Purple Gallinule	<i>Porphyryla martinica</i>	55
Common Moorhen	<i>Gallinula chloropus</i>	55
American Coot	<i>Fulica americana</i>	55
American Oystercatcher	<i>Haematopus palliatus</i>	55
Limpkin	<i>Aramus guarana</i>	33,55
Sandhill Crane	<i>Grus canadensis</i>	20,22
Killdeer	<i>Charadrius vociferus</i>	33,55
Solitary Sandpiper	<i>Tringa solitaria</i>	33,55
Spotted Sandpiper	<i>Actitis macularia</i>	33,55
Common Snipe	<i>Gallinago gallinago</i>	33,55
American Woodcock	<i>Scolopax minor</i>	20,31,33
Laughing Gull	<i>Larus atricilla</i>	55
Bonaparte's Gull	<i>Larus philadelphia</i>	55
Ring-billed Gull	<i>Larus delawarensis</i>	55
Black Tern	<i>Chlidonias niger</i>	55
Forester's Tern	<i>Sterna forsteri</i>	55
Sooty Tern	<i>Sterna fuscata</i>	55
Mourning Dove	<i>Zenaida macroura</i>	20,22,31
Yellow-billed Cuckoo	<i>Coccyzus americanus</i>	20,31,33
Common Barn Owl	<i>Tyto alba</i>	20,31,33
Eastern Screech Owl	<i>Otus asio</i>	20,31,33
Great Horned Owl	<i>Bubo virginianus</i>	20,31,33
Barred Owl	<i>Strix varia</i>	20,22,31,33
Common Nighthawk	<i>Chordeiles minor</i>	20,22
Chuck-will's-widow	<i>Caprimulgus carolinensis</i>	20,31,33
Whip-poor-will	<i>Caprimulgus vociferus</i>	20,31,33
Chimney Swift	<i>Chaetura pelagica</i>	20,22,31,33
Ruby-throated Hummingbird	<i>Archilochus colubris</i>	20,31,33
Belted Kingfisher	<i>Ceryle alcyon</i>	55
Red-headed Woodpecker	<i>Melanerpes erythrocephalus</i>	20,22
Red-bellied Woodpecker	<i>Melanerpes carolinus</i>	20,22
Yellow-bellied Sapsucker	<i>Sphyrapicus varius</i>	20,22,31,33
Downy Woodpecker	<i>Picoides pubescens</i>	20,22
Hairy Woodpecker	<i>Picoides villosus</i>	20,22
Northern Flicker	<i>Colaptes auratus</i>	20,22
Pileated Woodpecker	<i>Dryocopus pileatus</i>	20,22,31,33
Eastern Wood-Pewee	<i>Contopus virens</i>	20,22
Eastern Phoebe	<i>Sayornis phoebe</i>	20,22
Acadian Flycatcher	<i>Empidonax virescens</i>	20,22
Great Crested Flycatcher	<i>Myiarchus crinitus</i>	20,22
Eastern Kingbird	<i>Tyrannus tyrannus</i>	20,22
Purple Martin	<i>Progne subis</i>	20,22,31,33
Tree Swallow	<i>Tachycineta bicolor</i>	31,33
Northern Rough-winged Swallow	<i>Stelgidopteryx serripennis</i>	31,33
Bank Swallow	<i>Riparia riparia</i>	31,33

* Non-native Species

Edward Ball Wakulla Springs State Park
Animals

Common Name	Scientific Name	Primary Habitat Codes (for all species)
Barn Swallow	<i>Hirundo rustica</i>	31,33
Blue Jay	<i>Cyanocitta cristata</i>	20,22,31
American Crow	<i>Corvus brachyrhynchos</i>	Throughout
Fish Crow	<i>Corvus ossifragus</i>	20,22,33,55
Carolina Chickadee	<i>Parus carolinensis</i>	20,22,31,33
Tufted Titmouse	<i>Parus bicolor</i>	20,22
Red-breasted Nuthatch	<i>Sitta canadensis</i>	20,22,31
White-breasted Nuthatch	<i>Sitta carolinensis</i>	20,22,31
Brown-headed Nuthatch	<i>Sitta pusilla</i>	20,22
Brown Creeper	<i>Certhia americana</i>	20,22,31
Carolina Wren	<i>Thryothorus ludovicianus</i>	20,22,31,33
House Wren	<i>Troglodytes aedon</i>	20,22
Winter Wren	<i>Troglodytes troglodytes</i>	20,22
Marsh Wren	<i>Cistothorus palustris</i>	31,33,55
Sedge Wren	<i>Cistothorus platensis</i>	33,55
Golden-crowned Kinglet	<i>Regulus satrapa</i>	20,31,33
Ruby-crowned Kinglet	<i>Regulus calendula</i>	20,22
Blue-gray Gnatcatcher	<i>Polioptila caerulea</i>	20,22
Eastern Bluebird	<i>Sialia sialis</i>	20,22
Veery	<i>Catharus fuscescens</i>	20,22
Gray-cheeked Thrush	<i>Catharus minimus</i>	20,22
Swainson's Thrush	<i>Catharus ustulatus</i>	20,22
Hermit Thrush	<i>Catharus guttatus</i>	20,22
Wood Thrush	<i>Hylocichla mustelina</i>	20,22
American Robin	<i>Turdus migratorius</i>	20,22,31,33
Gray Catbird	<i>Dumetella carolinensis</i>	20,22,33
Northern Mockingbird	<i>Mimus polyglottos</i>	20,22,31,33
Brown Thrasher	<i>Toxostoma rufum</i>	20,22
Cedar Waxwing	<i>Bombycilla cedrorum</i>	20,22,31,33
Loggerhead Shrike	<i>Lanius ludovicianus</i>	22
White-eyed Vireo	<i>Vireo griseus</i>	20,22
Solitary Vireo	<i>Vireo solitarius</i>	20,22,31,33
Yellow-throated Vireo	<i>Vireo flavifrons</i>	20,22
Red-eyed Vireo	<i>Vireo olivaceus</i>	20,22
Golden-winged Warbler	<i>Vermivora chrysoptera</i>	20,22
Tennessee Warbler	<i>Vermivora peregrina</i>	20,22
Orange-crowned Warbler	<i>Vermivora celata</i>	20,22,31
Northern Parula	<i>Parula americana</i>	20,22,31
Black-throated Blue Warbler	<i>Dendroica caerulescens</i>	20,22
Chestnut-sided Warbler	<i>Dendroica pensylvanica</i>	20,22
Magnolia Warbler	<i>Dendroica magnolia</i>	20,22
Yellow-rumped Warbler	<i>Dendroica coronata</i>	20,22
Yellow-throated Warbler	<i>Dendroica dominica</i>	20,22
Pine Warbler	<i>Dendroica pinus</i>	20,22
Palm Warbler	<i>Dendroica palmarum</i>	20,22,31,33
Cerulean Warbler	<i>Dendroica cerulea</i>	20,22,31
Blackpoll Warbler	<i>Dendroica striata</i>	20,22
Black-and-white Warbler	<i>Mniotilta varia</i>	20,22,33

* Non-native Species

Edward Ball Wakulla Springs State Park
Animals

Common Name	Scientific Name	Primary Habitat Codes (for all species)
American Redstart	<i>Setophaga ruticilla</i>	20,22,33
Prothonotary Warbler	<i>Protonotaria citrea</i>	20,22,31,33
Worm-eating Warbler	<i>Helmitheros vermivorus</i>	20,31,33
Ovenbird	<i>Seiurus aurocapillus</i>	20,31,33
Northern Waterthrush	<i>Seiurus noveboracensis</i>	31,33,55
Louisiana Waterthrush	<i>Seiurus motacilla</i>	31,33,55
Kentucky Warbler	<i>Oporornis formosus</i>	20,22,31
Common Yellowthroat	<i>Geothlypis trichas</i>	20,55
Hooded Warbler	<i>Wilsonia citrina</i>	20,22
Wilson's Warbler	<i>Wilsonia pusilla</i>	20,22
Blue-winged Warbler	<i>Vermivora pinus</i>	20,22
Summer Tanager	<i>Piranga rubra</i>	20,22
Scarlet Tanager	<i>Piranga olivacea</i>	20,22,31
Northern Cardinal	<i>Cardinalis cardinalis</i>	20,21,31,33
Blue Grosbeak	<i>Guiraca caerulea</i>	20,31,33
Rose-breasted Grosbeak	<i>Pheucticus ludovicianus</i>	20,22
Indigo Bunting	<i>Passerina cyanea</i>	20,22
Rufous-sided Towhee	<i>Pipilo erythrophthalmus</i>	20,22
Chipping Sparrow	<i>Spizella passerina</i>	20,22
Field Sparrow	<i>Spizella pusilla</i>	20,22
Fox Sparrow	<i>Passerella iliaca</i>	22
Song Sparrow	<i>Melospiza melodia</i>	20,22
Swamp Sparrow	<i>Melospiza georgiana</i>	20,31,33
White-crowned Sparrow	<i>Zonotrichia leucophrys</i>	20,22
White-throated Sparrow	<i>Zonotrichia albicollis</i>	20,22
Dark-eyed junco	<i>Junco hyemalis</i>	20,31,33
Red-winged Blackbird	<i>Agelaius phoeniceus</i>	31,33
Rusty Blackbird	<i>Euphagus carolinus</i>	31,33
Boat-tailed Grackle	<i>Quiscalus major</i>	20,31,33
Common Grackle	<i>Quiscalus quiscula</i>	20,31,33
Brown-headed Cowbird	<i>Molothrus ater</i>	20,22
Orchard Oriole	<i>Icterus spurius</i>	20
Purple Finch	<i>Carpodacus purpureus</i>	20,31
Pine Siskin	<i>Carduelis pinus</i>	20,22
American Goldfinch	<i>Carduelis tristis</i>	20,31,33

MAMMALS

Nine-banded armadillo *	<i>Dasypus novemcinctus</i>	20,22,31,33
Opossum	<i>Didelphis marsupialis</i>	20,22,31
Eastern mole	<i>Scalopus aquaticus</i>	20,22,31
Marsh rabbit	<i>Sylvilagus palustris</i>	31,33
Eastern cottontail	<i>Sylvilagus floridanus</i>	20,22
Gray squirrel	<i>Sciurus carolinensis</i>	20,22,31
Fox squirrel	<i>Sciurus niger</i>	22
Southern flying squirrel	<i>Glaucomys volans</i>	20,22,31
Cotton mouse	<i>Peromyscus gossypinus</i>	20,22
Golden mouse	<i>Ochrotomys nuttalli</i>	20,22
Gray fox	<i>Urocyon cinereoargenteus</i>	20,22,31

* Non-native Species

**Edward Ball Wakulla Springs State Park
Animals**

Common Name	Scientific Name	Primary Habitat Codes (for all species)
Florida black bear	<i>Ursus americanus floridanus</i>	20,22,31,33
Raccoon	<i>Procyon lotor</i>	20,31,33
River otter	<i>Lutra canadensis</i>	33,55
Bobcat	<i>Felis rufus</i>	20,22,31
West Indian manatee	<i>Trichechus manatus latirostris</i>	55
White-tailed deer	<i>Odocoileus virginianus</i>	20,22,31,33
Southeastern bat	<i>Myotis austroriparius</i>	20,31,33,
Eastern pipistrel	<i>Pipistrellus subflavus</i>	20,31,33
Seminole bat	<i>Lasiurus seminolus</i>	20,31,33,55
Red bat	<i>Lasiurus borealis</i>	20,31,33
Eastern yellow bat	<i>Lasiurus intermedius</i>	20,31,33

Natural Community Habitat Codes

Terrestrial

1. Beach Dune
2. Bluff
3. Coastal Berm
4. Coastal Rock Barren
5. Coastal Strand
6. Dry Prairie
7. Maritime Hammock
8. Mesic Flatwoods
9. Coastal Grasslands
10. Pine Rockland
11. Prairie Hammock
12. Rockland Hammock
13. Sandhill
14. Scrub
15. Scrubby Flatwoods
16. Shell Mound
17. Sinkhole
18. Slope Forest
19. Upland Glade
20. Upland Hardwood Forest
21. Upland Mixed Forest
22. Upland Pine Forest
23. Xeric Hammock

Palustrine

24. Basin Marsh
25. Basin Swamp
26. Baygall
27. Bog
28. Bottomland Forest
29. Depression Marsh
30. Dome
31. Floodplain Forest
32. Floodplain Marsh
33. Floodplain Swamp
34. Freshwater Tidal Swamp
35. Hydric Hammock
36. Marl Prairie
37. Seepage Slope
38. Slough
39. Strand Swamp
40. Swale
41. Wet Flatwoods
42. Wet Prairie

Lacustrine

43. Clastic Upland Lake
44. Coastal Dune Lake
45. Coastal Rockland Lake

Lacustrine—Continued

46. Flatwood/Prairie Lake
47. Marsh Lake
48. River Floodplain Lake
49. Sandhill Upland Lake
50. Sinkhole Lake
51. Swamp Lake

Riverine

52. Alluvial Stream
53. Blackwater Stream
54. Seepage Stream
55. Spring-Run Stream

Estuarine

56. Estuarine Composite Substrate
57. Estuarine Consolidated Substrate
58. Estuarine Coral Reef
59. Estuarine Grass Bed
60. Estuarine Mollusk Reef
61. Estuarine Octocoral Bed
62. Estuarine Sponge Bed
63. Estuarine Tidal Marsh
64. Estuarine Tidal Swamp
65. Estuarine Unconsolidated Substrate
66. Estuarine Worm Reef

Marine

67. Marine Algal Bed
68. Marine Composite Substrate
69. Marine Consolidated Substrate
70. Marine Coral Reef
71. Marine Grass Bed
72. Marine Mollusk Reef
73. Marine Octocoral Bed
74. Marine Sponge Bed
75. Marine Tidal Marsh
76. Marine Tidal Swamp
77. Marine Unconsolidated Substrate
78. Marine Worm Reef

Subterranean

79. Aquatic Cave
80. Terrestrial Cave

Miscellaneous

81. Ruderal
82. Developed

MTC Many Types Of Communities

OF Overflying

Addendum 6—Designated Species List

**Rank Explanations
For FNAI Global Rank, FNAI State Rank, Federal Status,
And State Status**

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 Game and Freshwater Fish 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 man-made factor.
- G2 = Imperiled globally because of rarity (6 to 20 occurrences or less than 3000 individuals) or because of vulnerability to extinction due to some natural or man-made factor.
- G3 = Either very rare and local throughout its range (21-100 occurrences or less than 10,000 individuals) or found locally in a restricted range or vulnerable to extinction 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 and local throughout its range (21-100 occurrences or less than 10,000 individuals) or found locally in a restricted range or vulnerable to extinction

**Rank Explanations
For FNAI Global Rank, FNAI State Rank, Federal Status,
And State Status**

	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)

LEGAL STATUS

N	= Not currently listed, nor currently being considered for listing, by state or federal agencies.
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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 which is in danger of extinction throughout all or a significant portion of its range.
PE	= Proposed for addition to the List of Endangered and Threatened Wildlife and Plants as Endangered Species.
LT	= Listed as Threatened Species. Defined as any species which is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range.
PT	= Proposed for listing as Threatened Species.
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.

STATE

Animals (Listed by the Florida Fish and Wildlife Conservation Commission - FFWCC)

LE	= Listed as Endangered Species by the FFWCC. Defined as a species, subspecies, or isolated population which is so rare or depleted in number or so restricted in range of habitat due to any man-made or natural factors that it is in immediate danger of extinction or extirpation from the state, or which may attain such a status within the immediate future.
LT	= Listed as Threatened Species by the FFWCC. Defined as a species, subspecies, or isolated population which is acutely vulnerable to environmental alteration, declining in number at a rapid rate, or whose range or habitat is decreasing in area at a rapid rate and as a consequence is destined or very likely to become an endangered species within the foreseeable future.
LS	= Listed as Species of Special Concern by the FFWCC. Defined as a population which warrants special protection, recognition, or consideration because it has an inherent significant vulnerability to habitat modification, environmental alteration,

Rank Explanations
For FNAI Global Rank, FNAI State Rank, Federal Status,
And State Status

human disturbance, or substantial human exploitation which, in the foreseeable 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.

Edward Ball Wakulla Springs State Park
Designated Species
Plants

Common Name/ <i>Scientific Name</i>	<u>Designated Species Status</u>		
	FDA	USFWS	FNAI
Sweet-shrub <i>Calycanthus floridus</i>	LE		G5,S2
Eastern purple coneflower <i>Echinacea purpurea</i>	LE		G4,S1
Green adder's-mouth orchid <i>Malaxis unifolia</i>	LE		G5,S3
Little club-spur orchid <i>Platanthera clavellata</i>	LE		G5,SH
Queen's delight <i>Stillingia sylvatica</i>			G5,T2,S2

Edward Ball Wakulla Springs State Park
Designated Species
Animals

Common Name/ Scientific Name	<u>Designated Species Status</u>		
	FFWCC	USFWS	FNAI
REPTILES			
American alligator <i>Alligator mississippiensis</i>	LS	T(S/A)	G5,S4
Gopher tortoise <i>Gopherus polyphemus</i>	LS		G3,S3
Alligator snapping turtle <i>Macrochelys temminckii</i>	LS		G3,G4,S3
Suwannee cooter <i>Pseudemys concinna suwanniensis</i>	LS		G5,T3,S3
Florida pine snake <i>Pitnophis melanoleucus</i>	LS		G5,T5?,S3
BIRDS			
Roseate spoonbill <i>Ajaia ajaja</i>	LS		G5,S2,S3
Limpkin <i>Aramus guarauna</i>	LS		G5,S3
Great egret <i>Ardea alba</i>			G5, S4
Little blue heron <i>Egretta caerulea</i>	LS		G5,S4
Snowy egret <i>Egretta thula</i>	LS		G5,S4
Tricolored heron <i>Egretta tricolor</i>	LS		G5,S4
Swallow-tailed kite <i>Elanoides forficatus</i>			G4,S2,S3
White ibis <i>Eudocimus albus</i>	LS		G5,S4
Merlin <i>Falco columbarius</i>			G5,SU
Peregrine falcon <i>Falco peregrinus</i>	LE		G4,S2
Southeastern American kestrel <i>Falco sparverius</i>	LT		G5,T3,T4,S3?
American oystercatcher <i>Haematopus palliatus</i>	LS		G5,S3
Bald eagle <i>Haliaeetus leucocephalus</i>	LT	LT	G4,S3
Worm-eating warbler <i>Helminthos vermivorus</i>			G5,S1
Wood stork <i>Mycteria americana</i>	LE	LE	G4,S2
Yellow-crowned night heron <i>Nyctanassa violacea</i>			G5,S3?

**Edward Ball Wakulla Springs State Park
Designated Species
Animals**

Common Name/ Scientific Name	<u>Designated Species Status</u>		
	FFWCC	USFWS	FNAI
Black-crowned night-heron <i>Nycticorax nycticorax</i>			G5,S3?
Snail kite <i>Rostrhamus sociabilis plumbeus</i>	LE	LE	G4,G5,T1,S1
Louisiana waterthrush <i>Seiurus motacilla</i>			G5,S3
MAMMALS			
Sherman's fox squirrel <i>Sciurus niger shermani</i>	LS		G5,T2,S2
Manatee <i>Trichechus manatus</i>	LE	LE	G5,S2
Florida black bear <i>Ursus americanus floridanus</i>	LT		G5,T2,S2
ARTHROPODS			
Florida cave amphipod <i>Crangonyx grandimanus</i>			G2,S2
Hobbs' cave amphipod <i>Crangonyx hobbsi</i>			G2,S2
Swimming little Florida cave isopod <i>Remasellus parvus</i>			G1,S1
Big Blue Spring cave crayfish <i>Procambarus horsti</i>			G1,S1
Woodville Karst cave crayfish <i>Procambarus orcinus</i>			G1,S1

Addendum 7—Florida Master Site File List Of Cultural Sites

**Edward Ball Wakulla Springs State Park
Cultural Sites Listed In The Florida Master Site File**

FMSF#	Site Name	Culture	Description
WA00017	Wakulla Bridge	Weeden Island; Fort Walton; 19 th c. American	Artifact scatter; historic refuse
WA00024	Wakulla Springs	PaleoIndian	Kill site
WA00024A	Wakulla Springs	PaleoIndian	Pleistocene Megafauna
WA00304	Wakulla Boat	Late 19 th c. - e. 20 th c. US	Turn of the century mullet fishing boat
WA00305	Wakulla Springs Lodge	1937	Mediterranean Revival structure
WA00305A	Bath House	1935	Masonry structure
WA00305B	Conference Room	1935	Frame Structure
WA00305C	Engine House	1937	Mediterranean Revival structure
WA00305D	Staff Residence	1942	Frame Structure
WA00305E	Pump House	1935?	Mediterranean Revival structure
WA00305F	Water Tower	1936	Structure
WA00309	NN	Weeden Island	Mounds
WA00310	NN	Early Archaic	Habitation Site
WA00311	NN	Historic	Turpentine Camp
WA00312	Ways Site	Late Archaic; Weeden Island; Seminole	Habitation Site; Francis' Town?
WA00313	NN	Late Archaic	Habitation Site
WA00314	NN	Prehistoric	Lithic Scatter
WA00315	NN	Prehistoric	Lithic Scatter
WA00316	NN	Fort Walton	Habitation Site
WA00317	NN	Historic	Earthwork/ trash dump
WA00318	NN	Prehistoric	Lithic Scatter
WA00319	NN	Historic	Turpentine Distillery/Tar Processing; Watkin's Still?
WA00320	NN	Prehistoric	Lithic Scatter
WA00321	Bear	Deptford; Fort Walton	Village—Aute?
WA00322	NN	Middle Archaic; Late Archaic; Leon-Jefferson	Artifact Scatter
WA00323	NN	Prehistoric; Weeden Island	Lithic Scatter
WA00324	NN	Prehistoric	Lithic Scatter
WA00325	NN	Prehistoric	Lithic Scatter
WA00326	NN	Historic	House Site
WA00327	NN	Prehistoric	Lithic Scatter
WA00328	NN	Historic	Earthwork/Bridge?
WA00329	Wakulla Springs Lodge	PaleoIndian; Early Archaic; Weeden Island; Fort Walton/Leon-Jefferson	Village (Site of Wakulla Lodge)
WA00330	NN	Weeden Island; Fort Walton/Leon-Jefferson	Habitation Site; Mound? Village
WA00331	NN	Prehistoric	Lithic Scatter
WA00332	NN	Prehistoric	Lithic Scatter
WA00333	NN	Fort Walton/Leon-Jefferson	Habitation Site
WA00334	NN	Prehistoric	Lithic Scatter
WA00335	NN	Middle Archaic	Habitation Site
WA00336	NN	Weeden Island	Habitation Site

**Edward Ball Wakulla Springs State Park
Cultural Sites Listed In The Florida Master Site File**

WA00337	NN	Weeden Island	Habitation Site
WA00338	NN	Prehistoric	Lithic Scatter
WA00339	NN	Weeden Island	Habitation Site
WA00340	NN	Prehistoric	Lithic Scatter
WA00341	NN	Prehistoric	Lithic Scatter
WA00342	NN	Weeden Island	Habitation Site
WA00343	NN	Middle Archaic	Habitation Site
WA00344	NN	Weeden Island	Habitation Site
WA00345	NN	Prehistoric	Lithic Scatter
WA00346	NN	Prehistoric	Lithic Scatter
WA00347	NN	Prehistoric	Lithic Scatter
WA00348	NN	Prehistoric	Lithic Scatter
WA00349	NN	Weeden Island	Habitation Site
WA00350	NN	Prehistoric	Lithic Scatter
WA00351	NN	Historic	Earthwork; trash dump
WA00352	NN	Fort Walton	Habitation Site
WA00353	NN	Late Archaic/Norwood; Weeden Island	Habitation Site
WA00354	NN	Prehistoric	Lithic Scatter
WA00355	NN	Prehistoric	Lithic Scatter
WA00356	NN	Prehistoric	Lithic Scatter
WA00357	NN	Weeden Island; Fort Walton/Leon-Jefferson	Habitation Site
WA00358	NN	Late Archaic/Norwood; Deptford; Fort Walton	Habitation Site
WA00359	NN	Deptford or Swift Creek	Habitation Site
WA00360	NN	Prehistoric	Lithic Scatter
WA00361	NN	Late Archaic/Norwood	Habitation Site
WA00362	NN	Early Archaic; Middle Archaic; Weeden Island; Fort Walton	Habitation Site
WA00481	Wakulla Lodge West	Weeden Island; Seminole	Artifact Scatter
WA00513	Wakulla Springs Archaeological and Historic District	Paleolithic; Early Archaic; Middle Archaic; Deptford; Weeden Island; Fort Walton	Freshwater submerged (unspec.); Paleontological; Ceramic deposit
WA00539	Apple Snail	Weeden Island	Shell midden

Addendum 8—Timber Management Analysis

Edward Ball Wakulla Springs State Park
Timber Management Analysis

The timber assessment require by Chapters 253 and 259, Florida Statutes, was conducted in cooperation with staff from the DOF.

Timber Stand 1

Stand 1 is Burn Zone B, a 100 acre tract of 40 year old planted slash pine. The average density is between 350-450 stems per acre and the average diameter is 9 - 13 in. dbh. The average tree height is between 70 - 90 ft. The class sizes of the slash pines are sawtimber, chip-n-saw and pulpwood.

Understory growth is moderate with red bay, sweetgum, laurel oaks predominating. The ground cover is dominated by panicum, dog fennel, with various grasses and herbs.

The tract has been burned several times in the last 10 years. Most of these burns were done in the winter. One burn in the spring of 1993 apparently stressed part of the stand and a bark beetle infestation occurred. The infestation killed the slash pines on a 7-acre portion of the northern part of the tract. This 7-acre portion is now grown up with small hardwoods and dog fennel.

The topography is mostly level with the exception of a 6-acre depression area in the middle of the tract. The soil is well drained except for the depression area which is higher in moisture. Access to the stand will be from a park road that completely circles the tract.

Wildlife seen on this tract include whitetail deer, turkey, Sherman's fox squirrel, and Suwannee cooter turtles. The Suwannee cooter has been observed nesting in the northeast portion of the tract.

Timber Stand 2

Tract 2 is the northern portion of Burn Zone J and is about 10 acres in size. The tract is planted slash pine estimated to 30 years in age. Stocking of the pines is 400 - 500 trees per acre. The trees have an average diameter of 8 - 12 in. dbh. The average tree height is 60 - 75 ft. The class sizes of the slash pine is mostly chip-n-saw and pulpwood with some sawtimber.

The tract has been burned 3 times since 1992 so understory growth is moderate. The understory species are upland types such as southern red oak, hickory, sweetgum, and laural oak. Ground cover is sparse and includes broomsedge and other grasses and herbs. The soil is sandy and topography is level. Historically, this stand was probably sandhill community. Longleaf pine and wiregrass are found on the adjacent property to the west. Sparse wiregrass is present in the western part of this stand.

The western portion of the tract was used as a borrow pit for building some of the park roads prior to state ownership. Here the pines are smaller but wiregrass is present. Active gopher tortoise borrows are located within this portion of the tract.

Access to the site can be from a park patrol road. There is also a gated private drive adjacent to the tract that may be used for access if permission is granted from the landowners. There are five private homes along the boundary of this site.

Timber Stand 3

Tract number 3 is Burn Zone N. The tract is about 9-acres in size and contains some planted slash pine on its eastern boundary. These slash pine were probably planted as vista barrier to Highway 61 that borders the entire western side of this tract. The stand is very narrow and about a mile long. The slash pine are 20 - 30 years old and average about 200 stems per acre. The average diameter of the pines is 6 - 8 in. dbh. The average tree height is 50 -60 feet. . The class size of the slash pine is almost all pulpwood.

Understory growth is minor due to several recent burns. Small oaks, sweetgum, and pines are present. Ground cover is sparse in most areas, but there is some weed and grass growth on portions of the zone. Longleaf pine and larger hardwoods make up the western portion of the tract.

The soil is sandy and topography level except sloping some towards the state road right-of-way to

**Edward Ball Wakulla Springs State Park
Timber Management Analysis**

west. There are no wet areas. There are active gopher tortoise borrows on the adjacent burn zone to the east. Access is from Highway 61 on the west or a park patrol road to the west.

Timber Harvesting

Harvesting of Stands 1 and 2 would be similar and involves a partial thinning of the slash pines. The slash pine in the two stands would be thinned so that enough trees are left on site to allow prescribed burning to continue. After thinning, longleaf pines will be planted in the open areas. Once the longleaf pines are established and can carry and survive prescribed burning, the rest of the slash pine can be harvested. Planting of native grasses and other herbaceous plants will also be a part of the restoration of these two sites.

Harvesting of Stand 3 will remove all slash pines within the designated zone. Some native ground cover can be planted after harvesting, but most of the stand will be left to regenerate naturally. No longleaf pines will be cut in any of the timber stands.

Addendum 9—DHR Cultural Management Statement

**Management Procedures For
Archaeological And Historical Sites And Properties
On State -- Owned Or Controlled Lands
(Revised August, 1995)**

A. General Discussion

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

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

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

Thirdly, while sites uniquely reflect localized events, these events and the origin of particular sites are related to conditions and events in other times and places. Sites can be understood properly only in relation to their natural surroundings and the activities of inhabitants of other sites. Managers must be aware of this "systemic" character of historic and archaeological sites. Also, it should be recognized that archaeological sites are time capsules for more than cultural history; they preserve traces of past biotic communities, climate, and other elements of the environment that may be of interest to other scientific disciplines.

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

B. Statutory Authority

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

Chapter 267, Florida Statutes is the primary historic preservation authority of the state. The importance of protecting and interpreting archaeological and historic sites is recognized in 267.061(1)(a), F.S.: The rich and unique heritage of historic properties in this state, representing more than 10,000 years of human presence, is an important legacy to be valued and conserved for present and future generations. The destruction of these nonrenewable historic resources will engender a significant loss to the state's quality of life, economy, and cultural environment. It is therefore declared to be state policy to:

1. Provide leadership in the preservation of the state's historic resources; [and]
2. Administer state-owned or state-controlled historic resources in a spirit of stewardship and trusteeship;...

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

1. Cooperate with federal and state agencies, local Governments, and private organizations and

**Management Procedures For
Archaeological And Historical Sites And Properties
On State -- Owned Or Controlled Lands
(Revised August, 1995)**

individuals to direct and conduct a comprehensive statewide survey of historic resources and to maintain an inventory of such responses.

2. Develop a comprehensive statewide historic preservation plan.
3. Identify and nominate eligible properties to the National Register of Historic Places and otherwise administer applications for listing properties in the National Register of Historic Places.
4. Cooperate with federal and state agencies, local governments, and organizations and individuals to ensure that historic resources are taken into consideration at all levels of planning and development.
5. Advise and assist, as appropriate, federal and state agencies and local governments in carrying out their historic preservation responsibilities and programs.
6. Carry out on behalf of the state the programs of the National Historic Preservation Act of 1966, as amended, and to establish, maintain, and administer a state historic preservation program meeting the requirements of an approved program and fulfilling the responsibilities of state historic preservation programs as provided in subsection 101(b) of that act.
7. Take such other actions necessary or appropriate to locate, acquire, protect, preserve, operate, interpret, and promote the location, acquisition, protection, preservation, operation, and interpretation of historic resources to foster an appreciation of Florida history and culture. Prior to the acquisition, preservation, interpretation, or operation of a historic property by a state agency, the Division shall be provided a reasonable opportunity to review and comment on the proposed undertaking and shall determine that there exists historic authenticity and a feasible means of providing for the preservation, interpretation and operation of such property.
8. Establish professional standards for the preservation, exclusive of acquisition, of historic resources in state ownership or control.
9. Establish guidelines for state agency responsibilities under subsection (2).

Responsibilities of other state agencies of the executive branch, pursuant to 267.061(2), F.S., include:

1. Each state agency of the executive branch having direct or indirect jurisdiction over a proposed state or state-assisted undertaking shall, in accordance with state policy and prior to the approval of expenditure of any state funds on the undertaking, consider the effect of the undertaking on any historic property that is included in, or eligible for inclusion in, the National Register of Historic Places. Each such agency shall afford the division a reasonable opportunity to comment with regard to such an undertaking.
2. Each state agency of the executive branch shall initiate measures in consultation with the division to assure that where, as a result of state action or assistance carried out by such agency, a historic property is to be demolished or substantially altered in a way that adversely affects the character, form, integrity, or other qualities that contribute to [the] historical, architectural, or archaeological value of the property, timely steps are taken to determine that no feasible and prudent alternative to the proposed demolition or alteration exists, and, where no such alternative is determined to exist, to assure that timely steps are taken either to avoid or mitigate the adverse effects, or to undertake an appropriate archaeological salvage excavation or other recovery action to document the property as it existed prior to demolition or alteration.
3. In consultation with the division [of Historical Resources], each state agency of the executive branch shall establish a program to locate, inventory, and evaluate all historic properties under the agency's ownership or control that appear to qualify for the National Register. Each such agency shall exercise caution to assure that any such historic property is not inadvertently transferred, sold, demolished, substantially altered, or allowed to deteriorate significantly.
4. Each state agency of the executive branch shall assume responsibility for the preservation of historic resources that are owned or controlled by such agency. Prior to acquiring, constructing,

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or leasing buildings for the purpose of carrying out agency responsibilities, the agency shall use, to the maximum extent feasible, historic properties available to the agency. Each agency shall undertake, consistent with preservation of such properties, the mission of the agency, and the professional standards established pursuant to paragraph (3)(k), any preservation actions necessary to carry out the intent of this paragraph.

5. Each state agency of the executive branch, in seeking to acquire additional space through new construction or lease, shall give preference to the acquisition or use of historic properties when such acquisition or use is determined to be feasible and prudent compared with available alternatives. The acquisition or use of historic properties is considered feasible and prudent if the cost of purchase or lease, the cost of rehabilitation, remodeling, or altering the building to meet compliance standards and the agency's needs, and the projected costs of maintaining the building and providing utilities and other services is less than or equal to the same costs for available alternatives. The agency shall request the division to assist in determining if the acquisition or use of a historic property is feasible and prudent. Within 60 days after making a determination that additional space is needed, the agency shall request the division to assist in identifying buildings within the appropriate geographic area that are historic properties suitable for acquisition or lease by the agency, whether or not such properties are in need of repair, alteration, or addition.
6. Consistent with the agency's mission and authority, all state agencies of the executive branch shall carry out agency programs and projects, including those under which any state assistance is provided, in a manner which is generally sensitive to the preservation of historic properties and shall give consideration to programs and projects which will further the purposes of this section.

Section 267.12 authorizes the Division to establish procedures for the granting of research permits for archaeological and historic site survey or excavation on state-owned or controlled lands, while Section 267.13 establishes penalties for the conduct of such work without first obtaining written permission from the Division of Historical Resources. The Rules of the Department of State, Division of Historical Resources, for research permits for archaeological sites of significance are contained in Chapter 1A-32, F.A.C.

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

C. Management Policy

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

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

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

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sort of detailed management or use plan involving decisions about the relative historic value of individual sites. For this reason, a generalized policy of conservation is recommended until the resources have been better addressed.

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

1. State land managers shall coordinate all planned activities involving known archaeological or historic sites or potential site areas closely with the Division of Historical Resources in order to prevent any kind of disturbance to significant archaeological or historic sites that may exist on the tract. Under 267.061(1)(b), F.S., the Division of Historical Resources is vested with title to archaeological and historic resources abandoned on state lands and is responsible for administration and protection of such resources. The Division will cooperate with the land manager in the management of these resources. Furthermore, provisions of 267.061(2) and 267.13, F.S., combined with those in 267.061(3) and 253.034(4), F.S., require that other managing (or permitting) agencies coordinate their plans with the Division of Historical Resources at a sufficiently early stage to preclude inadvertent damage or destruction to known or potentially occurring, presently unknown archaeological and historic sites. The provisions pertaining to human burial sites must also be followed by state land managers when such remains are known or suspected to be present (see 872.02 and 872.05, F.S., and 1A-44, F.A.C.)
2. Since the actual resources are so poorly known, the potential impact of the managing agency's activities on historic archaeological sites may not be immediately apparent. Special field survey for such sites may be required to identify the potential endangerment as a result of particular management or permitting activities. The Division may perform surveys, as its resources permit, to aid the planning of other state agencies in their management activities, but outside archaeological consultants may have to be retained by the managing agency. This would be especially necessary in the cases of activities contemplating ground disturbance over large areas and unexpected occurrences. It should be noted, however, that in most instances Division staff's knowledge of known and expected site distribution is such that actual field surveys may not be necessary, and the project may be reviewed by submitting a project location map (preferably a 7.5 minute U.S.G.S. Quadrangle map or portion thereof) and project descriptive data, including detailed construction plans. To avoid delays, Division staff should be contacted to discuss specific project documentation review needs.
3. In the case of known significant sites, which may be affected by proposed project activities, the managing agency will generally be expected to alter proposed management or development plans, as necessary, or else make special provisions to minimize or mitigate damage to such sites.
4. If in the course of management activities, or as a result of development or the permitting of dredge activities (see 403.918(2)(6)a, F.S.), it is determined that valuable historic or archaeological sites will be damaged or destroyed, the Division reserves the right, pursuant to 267.061(1)(b), F.S., to require salvage measures to mitigate the destructive impact of such activities to such sites. Such salvage measures would be accomplished before the Division would grant permission for destruction of the affected site areas. The funding needed to implement salvage measures would be the responsibility of the managing agency planning the site destructive activity. Mitigation of historic structures at a minimum involves the preparation of measured drawings and documentary photographs. Mitigation of archaeological resources involves the excavation, analysis and reporting of the project findings and must be planned to occur sufficiently in advance to avoid project construction delays. If these services are to be contracted by the state agency, the selected consultant will need to obtain an Archaeological Research Permit from the Division of Historical Resources, Bureau of Archaeological Research (see 267.12, F.S. and Rules 1A-32 and 1A-46 F.A.C.).
5. For the near future, excavation of non-endangered (i.e., sites not being lost to erosion or

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development) archaeological site is discouraged. There are many endangered sites in Florida (on both private and public lands) in need of excavation because of the threat of development or other factors. Those within state-owned or controlled lands should be left undisturbed for the present - with particular attention devoted to preventing site looting by "treasure hunters". On the other hand, the archaeological and historic survey of these tracts is encouraged in order to build an inventory of the resources present, and to assess their scientific research potential and historic or architectural significance.

6. The cooperation of land managers in reporting sites to the Division that their field personnel may discover is encouraged. The Division will help inform field personnel from other resource managing agencies about the characteristics and appearance of sites. The Division has initiated a cultural resource management training program to help accomplish this. Upon request the Division will also provide to other agencies archaeological and historical summaries of the known and potentially occurring resources so that information may be incorporated into management plans and public awareness programs (See Management Implementation).
7. Any discovery of instances of looting or unauthorized destruction of sites must be reported to the agent for the Board of Trustees of the Internal Improvement Trust Fund and the Division so that appropriate action may be initiated. When human burial sites are involved, the provisions of 872.02 and 872.05, F. S. and Rule 1A-44, F.A.C., as applicable, must also be followed. Any state agent with law enforcement authority observing individuals or groups clearly and incontrovertibly vandalizing, looting or destroying archaeological or historic sites within state-owned or controlled lands without demonstrable permission from the Division will make arrests and detain those individuals or groups under the provisions of 267.13, 901.15, and 901.21, F.S., and related statutory authority pertaining to such illegal activities on state-owned or controlled lands. County Sheriffs' officers are urged to assist in efforts to stop and/or prevent site looting and destruction.
8. In addition to the above management policy for archaeological and historic sites on state-owned land, special attention shall be given to those properties listed in the National Register of Historic Places and other significant buildings. The Division recommends that the Secretary of the Interior's Standards for Rehabilitation and Guidelines for Rehabilitating Historic Buildings (Revised 1990) be followed for such sites.
9. The following general standards apply to all treatments undertaken on historically significant properties.
10. A property shall be used for its historic purpose or be placed in a new use that requires minimal change to the defining characteristics of the building and its site and environment.
11. The historic character of a property shall be retained and preserved. The removal of historic materials or alterations of features and spaces that characterize a property shall be avoided.
12. Each property shall be recognized as a physical record of its time, place and use. Changes that create a false sense of historical development, such as adding conjectural features or architectural elements from other buildings, shall not be undertaken.
13. Most properties change over time; those changes that have acquired historic significance in their own right shall be retained and preserved.
14. Distinctive features, finishes, and construction techniques or examples of craftsmanship that characterize a historic property shall be preserved.
15. Deteriorated historic features shall be repaired rather than replaced. Where the severity of deterioration requires replacement of a distinctive feature, the new feature shall match the old in design, color, texture, and other visual qualities and, where possible, materials. Replacement of missing features shall be substantiated by documentary, physical, or pictorial evidence.

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16. Chemical or physical treatments, such as sandblasting, that cause damage to historic materials shall not be used. The surface cleaning of structures, if appropriate, shall be undertaken using the gentlest means possible.
17. Significant archaeological resources affected by a project shall be protected and preserved. If such resources must be disturbed, mitigation measures shall be undertaken.
18. New additions, exterior alterations, or related new construction shall not destroy materials that characterize the property. The new work shall be differentiated from the old and shall be compatible with the massing, size, scale, and architectural features to protect the historic integrity of the property and its environment.
19. New additions and adjacent or related new construction shall be undertaken in such a manner that if removed in the future, the essential form and integrity of the historic property and its environment would be unimpaired. (see Secretary of the Interior's Standards for Rehabilitation and Guidelines for Rehabilitating Historic Buildings [Revised 1990]).

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

D. Management Implementation

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

1. All land managing agencies should contact the Division and send U.S.G.S. 7.5 minute quadrangle maps outlining the boundaries of their various properties.
2. The Division will in turn identify site locations on those maps and provide descriptions for known archaeological and historical sites to the managing agency.
3. Further, the Division may also identify on the maps areas of high archaeological and historic site location probability within the subject tract. These are only probability zones, and sites may be found outside of these areas. Therefore, actual ground inspections of project areas may still be necessary.
4. The Division will send archaeological field recording forms and historic structure field recording forms to representatives of the agency to facilitate the recording of information on such resources.
5. Land managers will update information on recorded sites and properties.
6. Land managers will supply the Division with new information as it becomes available on previously unrecorded sites that their staff locate. The following details the kind of information the Division wishes to obtain for any new sites or structures that the land managers may report:

A. Historic Sites

- (1) Type of structure (dwelling, church, factory, etc.).
- (2) Known or estimated age or construction date for each structure and addition.
- (3) Location of building (identify location on a map of the property, and building placement, i.e., detached, row, etc.).
- (4) General Characteristics: (include photographs if possible) overall shape of plan (rectangle, "L" "T" "H" "U", etc.); number of stories; number of vertical divisions of bays; construction materials (brick, frame, stone, etc.); wall finish (kind of bond, coursing, shingle, etc.); roof shape.
- (5) Specific features including location, number and appearance of:
 - (a) Important decorative elements;
 - (b) Interior features contributing to the character of the building;
 - (c) Number, type, and location of outbuildings, as well as date(s) of construction;
 - (d) Notation if property has been moved;
 - (e) Notation of known alterations to building.

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B. Archaeological Sites

- (1) Site location (written narrative and mapped location).
 - (2) Cultural affiliation and period.
 - (3) Site type (midden, burial mound, artifact scatter, building rubble, etc.).
 - (4) Threats to site (deterioration, vandalism, etc.).
 - (5) Site size (acreage, square meters, etc.).
 - (6) Artifacts observed on ground surface (pottery, bone, glass, etc.).
 - (7) Description of surrounding environment.
1. No land disturbing activities should be undertaken in areas of known archaeological or historic sites or areas of high site probability without prior review by the Division early in the project planning.
 2. Ground disturbing activities may proceed elsewhere but land managers should stop disturbance in the immediate vicinity of artifact finds and notifies the Division if previously unknown archaeological or historic remains are uncovered. The provisions of Chapter 872, F.S., must be followed when human remains are encountered.
 3. Excavation and collection of archaeological and historic sites on state lands without a permit from the Division are a violation of state law and shall be reported to a law enforcement officer. The use of metal detectors to search for historic artifacts shall be prohibited on state lands except when authorized in a 1A-32, F.A.C., research permit from the Division.
 4. Interpretation and visitation which will increase public understanding and enjoyment of archaeological and historic sites without site destruction or vandalism is strongly encouraged.
 5. Development of interpretive programs including trails, signage, kiosks, and exhibits is encouraged and should be coordinated with the Division.
 6. Artifacts found or collected on state lands are by law the property of the Division. Land managers shall contact the Division whenever such material is found so that arrangements may be made for recording and conservation. This material, if taken to Tallahassee, can be returned for public display on a long term loan.

E. Administering Agency

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

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

Contact Person:

Susan M. Harp
Historic Preservation Planner
Telephone (904) 487-2333
Suncom 277-2333
FAX (904) 922-0496

Addendum 10--Priority Schedule And Cost Estimates

**Edward Ball Wakulla Springs State Park
Priority Schedule And Cost Estimates**

1. Exotic plants controls. Ninety-nine percent for hydrilla control. **Estimated Cost:** \$100,000 (annual recurring cost)
2. Prescribed burn program. Equipment for new fire trucks and personal protection equipment. Personnel to do the burns. **Estimated Cost:** \$50,000
3. Monitor water quality of Wakulla Spring and Wakulla River. Equipment for lab, cost of having water samples analyzed. Tube replacement. **Estimated Cost:** \$5000
4. Monitor and protect designated species. Surveys, camera equipment, repair of the river fence, and fencing of the area west of State Road 61(70,000 linear feet) . **Estimated Cost:** \$130,000.
5. Record and graph visibility of Wakulla Spring and daily rainfall. Equipment and cost of producing an educational program. **Estimated Cost:** \$1,000
6. Restoration of Cherokee Sink. Planning, clean-up, native species planting, access controls and erosion controls. (Does not include dredging. Dredging of site could add considerable cost to project.) **Estimated Cost:** \$60,000.
7. Establishment of a park self-sufficient hydrilla removal program. Includes a hydrilla harvesting machine, a conveyor system, a new dump truck, and one full-time FTE position to operate the program. If enacted could replace item number 1. **Estimated Cost:** \$350,000
8. Expansion of the upland pine natural community restoration project. Equipment and herbicides. Native plant seedlings. **Estimated Cost:** \$20,000
9. Continue exploration and mapping of the Wakulla Springs cave system by approved volunteer groups. Equipment, film and video equipment. **Estimated Cost:** \$5,000
10. Compile written report on the Full River Survey and produce an information program. Production costs, copies. **Estimated Cost:** \$1,000
11. Establish the use of GIS and GPS for natural resources at the park with assistance of District staff. Travel cost, equipment and computer software. **Estimated Cost:** \$5,000.
12. Funding for three FTE positions to meet additional management demands presented by an expanded resource base and new recreational facilities. Positions needed include a Park Services Specialist and two Rangers.
 - ◆ **Park Service Specialist - \$33,689.00 per year**
 - ◆ **2 Park Ranger - \$28,329.00 per year, times two = \$56,658.00 per year**

Addendum 11—Land Management Review Report And DRP Response

Land Management Review of Edward Ball Wakulla Springs State Park

Wakulla County--Lease No. 3463

May 12, 2000

Prepared by Division of State Lands Staff

Delmas T. Barber, OMC Manager

Penny Rolleston, Planner II

David Petti, Environmental Specialist II

Alphonso Craig, Staff

Land Manager:

Area:

County:

Mngt. Plan Approved:

Mngt. Plan Update Due:

Division of Recreation and Parks

4,718.15 acres

Wakulla County

5/29/1997

5/29/2002

**Edward Ball Wakulla Springs State Park
Land Management Review Report And DRP Response**

Management Review Team Members

Agency Represented	Team member Appointed	Team member in attendance
DEP	Mr. Adam Munson	Mr. Adam Munson
DEP /DRP	Mr. John Bente	Mr. John Bente
DACS/DOF	Mr. Bill Korn	Mr. Bill Korn
Florida Wildlife Federation	Mr. Manley Fuller	Mr. Manley Fuller
Wakulla County Soil and Water Conservation District	Mr. Henry Creek	Mr. Henry Creek
FFWCC	Mr. J. Daniel Sullivan	Mr. J. Daniel Sullivan

Process for Implementing Regional Management Review Teams

Legislative Intent and Guidance:

Chapter 259.036, F. S. was enacted in 1997 to determine whether conservation, preservation, and recreation lands owned by the state Board of Trustees of the Internal Improvement Trust Fund (Board) are being managed properly. It directs the Department of Environmental Protection (DEP) to establish land management review teams to evaluate the extent to which the existing management plan provides sufficient protection to threatened or endangered species, unique or important natural or physical features, geological or hydrological functions, and archaeological features. The teams also evaluate the extent to which the land is being managed for the purposes for which it was acquired and the degree to which actual management practices, including public access, are in compliance with the adopted management plan. If a land management plan has not been adopted, the review shall consider the extent to which the land is being managed for the purposes for which it was acquired and the degree to which actual management practices are in compliance with the management policy statement and management prospectus for that property. If the land management review team determines that reviewed lands are not being managed for the purposes for which they were acquired or in compliance with the adopted land management plan, management policy statement, or management prospectus, DEP shall provide the review findings to the Board, and the managing agency must report to the Board its reasons for managing the lands as it has. A report of the review findings are given to the managing agency under review, the Land Acquisition and Management Advisory Council (LAMAC), and to the Division of State Lands. Also, DEP shall report the annual review findings of its land management review teams to the Board no later than the second board meeting in October of each year.

Review Site

The management review of Edward Ball Wakulla Spring State Park Area considered approximately 2902 acres in Wakulla County that are managed by the Division of Recreation and Parks (DRP). The team evaluated the extent to which current management actions are sufficient, whether the land is being managed for the purpose for which it was acquired, and whether actual management practices, including public access, are in compliance with the management plan. The Division of State Lands approved the management plan on November 17, 1994, and the management plan update is due now.

Review Team Determination

1. Is the land being managed for the purpose for which it was acquired?
 - All team members agreed that Edward Ball Wakulla Springs State Park is being managed for the purpose for which it was acquired.
2. Are actual management practices, including public access, in compliance with the

**Edward Ball Wakulla Springs State Park
Land Management Review Report And DRP Response**

management plan?

- All team members agreed that actual management practices, including public access, were in compliance with the management plan for this site.

Commendations to the Managing Agency

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

1. The team commends the park staff for use of prescribed fire and land wood control measures to restore the upland pine community given their limited resources
2. The team commends the park staff for recognizing and attempting to address serious aquatic and vegetation problems.

Exceptional Management Actions

The following items received high scores on the review team checklist which indicates that management actions exceeded expectations.

1. Protection and maintenance of upland pine forest, upland hardwood forest, and aquatic cave.
2. Survey (identify and locate) and protection and preservation of cultural resources.
3. Resources management of prescribed fire of area being burned, frequency, and quality.
4. Hydrological and geologic function of ground water and surface water monitoring in quality and quantity.
5. Adjacent property concerns in land use of encroaching development and inholdings.
6. Recreational opportunities and environmental education/outreach.
7. Management resources of waste disposal and staffing.

Recommendations and Checklist Findings

Recommendations

The following recommendations resulted from a discussion and vote of review team members.

1. No recommendations

Checklist Findings

The following items received low scores on the review team checklist which indicates that management actions were insufficient (f) or that the issue was not sufficiently addressed in the management plan (p). These items need to be addressed in the management plan update.

1. Resource management of frequency of area being burned (p)

DRP Response: **Agree.** Frequency of burning has been addressed in the unit management plan 5-year revision.

2. Resource Management of plants, land use and poaching. (p)

DRP Response: **Plants and land use—Agree.** Management of plants and land use has been addressed in the unit management plan 5-year revision.

Poaching (p): Disagree. Poaching has never been identified as a major problem at Wakulla Springs State Park. Both trespassing and poaching are adequately being handled by boundary fencing, park patrols, and park law enforcement. Addressing poaching in the unit plan revision would infer that this is a management problem. Currently, poaching is not considered to be a problem at the park.