Natural Bridge Battlefield Historic State Park

Horn Springs Addition Management Plan Amendment

Advisory Group Draft

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL PROTECTION

Division of Recreation and Parks
August 2018

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INTRODUCTION

The Horn Springs Addition to Natural Bridge Battlefield Historic State Park is in unincorporated Leon County, approximately 15 miles southeast of Tallahassee (see Vicinity Map). Access to the property is from Natural Bridge Road off State Road 363 near the community of Woodville (see Reference Map). In addition, significant land and water resources existing near the park have been identified on the Vicinity Map.

Natural Bridge Battlefield Historic State Park was acquired in 1950 as a donation from the United Daughters of the Confederacy (see Appendix 1). In October 2016, the Board of Trustees of the Internal Improvement Fund approved the acquisition of the Horn Springs Property from Natural Bridge Timberlands, Inc. Of the 11,037-acre acquisition, 1,989.81 acres was leased to the Division of Recreation and Parks to be managed as part of Natural Bridge Battlefield Historic State Park. Currently the park contains 2,125.01 acres.

At Natural Bridge Battlefield Historic State Park, public outdoor recreation and conservation is the designated single use of the property. There are no legislative or executive directives that constrain the use of this property.

Purpose and Significance of the Horn Springs Addition

The purpose of the Horn Spring acquisition is to protect Florida's biodiversity at the species, natural community, and landscape levels. The Horn Springs Addition is a critical component of a planned wildlife corridor along the St. Marks River and will protect regional water resources, cultural resources, and increase public recreation and education opportunities.

Property Significance

The property contains ten springs, including Horn Spring, for which the property is named. There are three other springs in this same vicinity named Little Horn Spring #1, 2, and 3, Rhodes Springs #1 and 4, Natural Bridge Spring (a/k/a Jim French Spring), Natural Bridge Spring #2, and Gerrell Spring #4 and 5. The Horn Springs Addition, especially on the property south of Natural Bridge Road, is particularly distinctive for its variety of dramatic karst features, including swallets, springs and spring-run streams of various sizes.

The property protects the site of the Battle of Natural Bridge, which was the second largest American Civil War battle fought in the state of Florida. A diverse group of Confederate troops defended the Natural Bridge, which protected Tallahassee as the only capital east of the Mississippi River that was not captured by Union forces.

Natural Bridge Battlefield Historic State Park is classified as a special feature site in DRP’s unit classification system. A "special feature" is a discrete and well-defined

object or condition that attracts public interest and provides recreational enjoyment through visitation, observation and study. A state special feature site is an area which contains such a feature, and which is set aside for controlled public enjoyment. Special feature sites for the most part are either historical or archaeological by type, but they may also have a geological, botanical, zoological or other basis. State special feature sites must be of unusual or exceptional character, or have statewide or broad regional significance.

In the management of a special feature site, primary emphasis is placed on protection and maintenance of the special feature for long-term public enjoyment. Permitted uses are almost exclusively passive in nature and program emphasis is on interpretation of the special feature. Development at special feature sites is focused on protection and maintenance of the site, public access, safety and the convenience of the user.

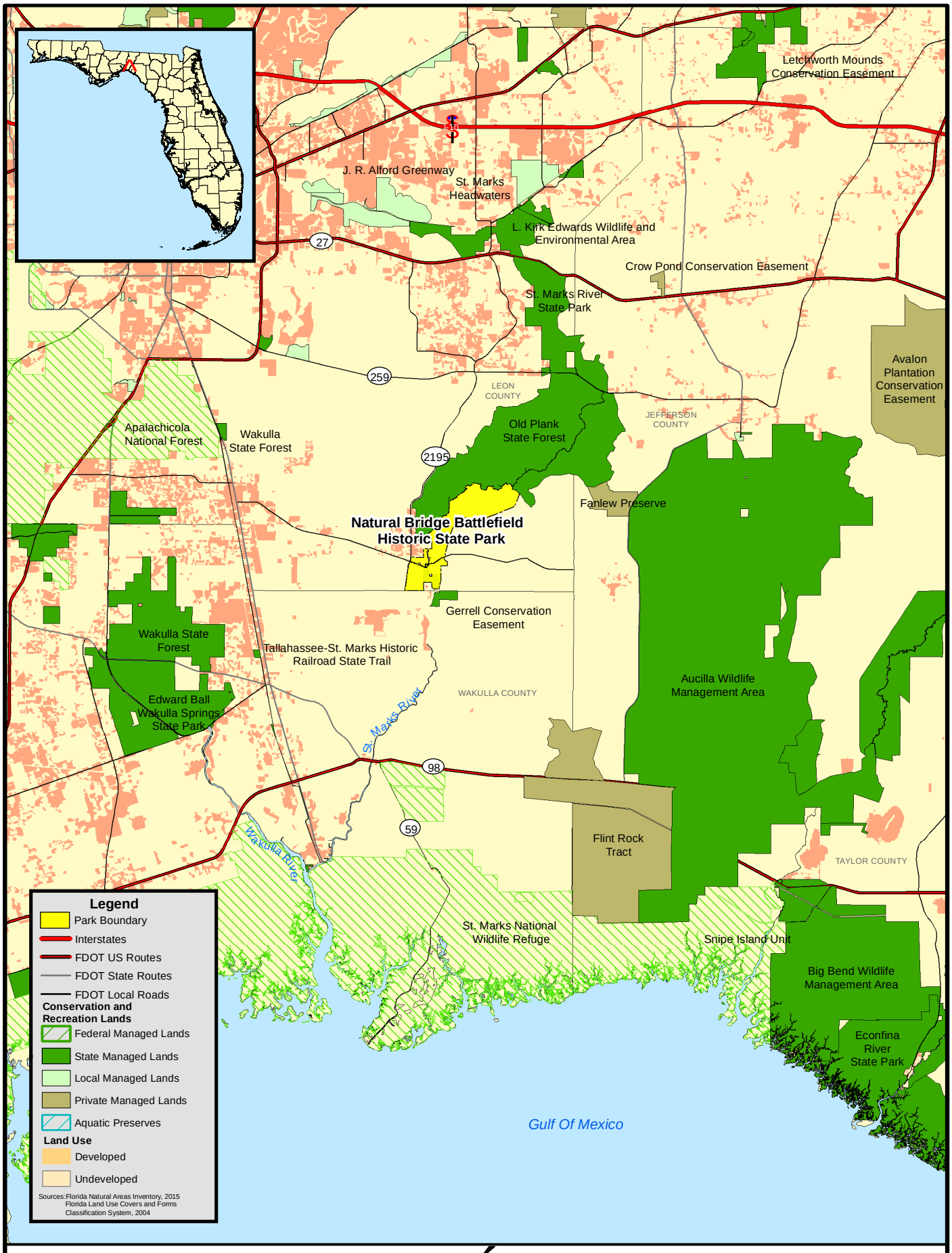
Purpose and Scope of the Plan

This plan amendment serves as the basic statement of policy and direction for the management of the Horn Springs Addition to the Natural Bridge Battlefield Historic State Park as a unit of Florida's state park system. It identifies the goals, objectives, actions and criteria or standards that guide each aspect of park administration, and sets forth the specific measures that will be implemented to meet management objectives and provide balanced public utilization. The plan is intended to meet the requirements of Sections 253.034 and 259.032, Florida Statutes, Chapter 18-2, Florida Administrative Code, and is intended to be consistent with the State Lands Management Plan. With approval, this management plan amendment will be included with the February 24, 2016 approved plan.

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

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

The Implementation Component consolidates the measurable objectives and actions for each of the park’s management goals. An implementation schedule and cost estimates are included for each objective and action.



NATURAL BRIDGE BATTLEFIELD HISTORIC STATE PARK

0 1.25 2.5 5 Miles

Florida Department of Environmental Protection
Division of Recreation and Parks

VICINITY MAP

OLD PLANK
STATE FOREST

Horn Springs

NATURAL BRIDGE BATTLEFIELD
HISTORIC STATE PARK

RAL BRIDGE ROAD

OLD PLANK ROAD

St. Marks River

LEON COUNTY
WAKULLA COUNTY

bing

LEGEND

- Florida Springs (2016)
- Horn Springs Addition
- Park Boundary
- Old Plank State Forest
- County Line
- St. Marks River

HORN SPRINGS ADDITION
NATURAL BRIDGE BATTLEFIELD
HISTORIC STATE PARK

N

0 0.25 0.5 1 Miles

Florida Department of Environmental Protection
Division of Recreation and Parks
Date of aerial 2018

REFERENCE MAP

Included in this table are (1) measures that will be used to evaluate the DRP's implementation progress, (2) timeframes for completing actions and objectives and (3) estimated costs to complete each action and objective.

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

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

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

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

Management Program Overview

Management Authority and Responsibility

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

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

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

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

Park Management Goals

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

- Provide administrative support for all park functions.
- Protect water quality and quantity in the park, restore hydrology to the extent feasible and maintain the restored condition.
- Restore and maintain the natural communities/habitats of the park.

- Maintain, improve or restore imperiled species populations and habitats in the park.
- Remove exotic and invasive plants and animals from the park and conduct needed maintenance-control.
- Protect, preserve and maintain the cultural resources of the park.
- Provide public access and recreational opportunities in the park.
- Develop and maintain the capital facilities and infrastructure necessary to meet the goals and objectives of this management plan.

Management Coordination

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

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

Public Participation

DRP provided an opportunity for public input by conducting a public workshop and an Advisory Group meeting to present the draft management plan to the public. These meetings were held on August 6 and 7, 2018, respectively. Meeting notices were published in the Florida Administrative Register, DATE, Volume, Number, included on the Department Internet Calendar, posted in clear view at the park, and promoted locally. The purpose of the Advisory Group meeting is to provide the Advisory Group members an opportunity to discuss the draft management plan (see Appendix 2).

Other Designations

Natural Bridge Battlefield Historic State Park is not within an Area of Critical State Concern as defined in Section 380.05, Florida Statutes, and it is not presently under study for such designation.

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

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RESOURCE MANAGEMENT COMPONENT

Introduction

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

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

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

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

Management Goals, Objectives and Actions

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

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

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

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

Natural and Cultural Resource Management

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

Table 1: Horn Springs Addition Management Zones

Management Zone	Acreage	Managed with Prescribed Fire	Contains Known Cultural Resources
7	116.1	Y	Y
8	265.6	Y	Y
9	83.5	Y	Y
10	343.0	Y	Y
11	452.4	Y	Y
12	290.7	Y	N

Table 1: Horn Springs Addition Management Zones			
Management Zone	**Acreage**	**Managed with Prescribed Fire**	**Contains Known Cultural Resources**
13	252.1	Y	N
14	179.3	Y	N

Soils and Geological Resources

Description and Assessment

Topography

The park is situated in the major physiographic division known as the Gulf Coastal Lowlands, which is subdivided into the Apalachicola Coastal Lowlands and the Woodville Karst Plain. The Woodville Karst Plain, on which the park is located, is a gently sloping landscape with elevation generally not exceeding 60 feet. It is characterized by loose quartz sands thinly veneering a limestone substratum that has resulted in sinkhole-sand dune topography throughout this landscape.

The Woodville Karst Plain is further divided into two areas based on elevation, the Lake Munson Hills and the Wakulla Sand Hills. The park is situated in the Wakulla Sand Hills at the plain's southern edge, immediately adjacent to the St. Marks River. This area consists of a series of relict sand dunes associated with an ancient shoreline existing when sea levels were higher. Another significant topographical feature at the park is a narrow strip along the river and its floodplain valley called the St. Marks River Valley Lowlands. Soils are sandy and frequently wet in this strip; the river itself generally flows upon or is slightly incised into the bedrock.

On the larger-scale, the park's landscape slopes gently toward the shoreline of the St. Marks River with an overall elevation gradient decreasing from north to south along the river's direction of flow. The Horn Springs Addition, especially on the property south of Natural Bridge Road, and the Rakestraw Tract is particularly distinctive for its variety of dramatic karst features, including swallets, springs and spring-run streams of various sizes. North of the Horn Springs Addition, the river is heavily influenced by the surrounding interior swamp stands; the water supply is highly variable and dependent on recent rainfall amounts. The primary flow path is usually noticeably flowing only on the days following significant rain events. During moderately wet or dry times of the year, the floodplain surface is typically pooled and saturated or is mostly dry on the higher reaches, respectively. When the surface water flow from Horn Spring itself joins the St. Marks River, the river itself takes on a more definite form of a main channel surrounded by an undulating landscape of alluvial forests, bottomland forests, and floodplain swamps.

At the edge of the original park parcel, the river submerges below the landscape for about 0.6 mile before reemerging at the St. Marks River Rise located south of the

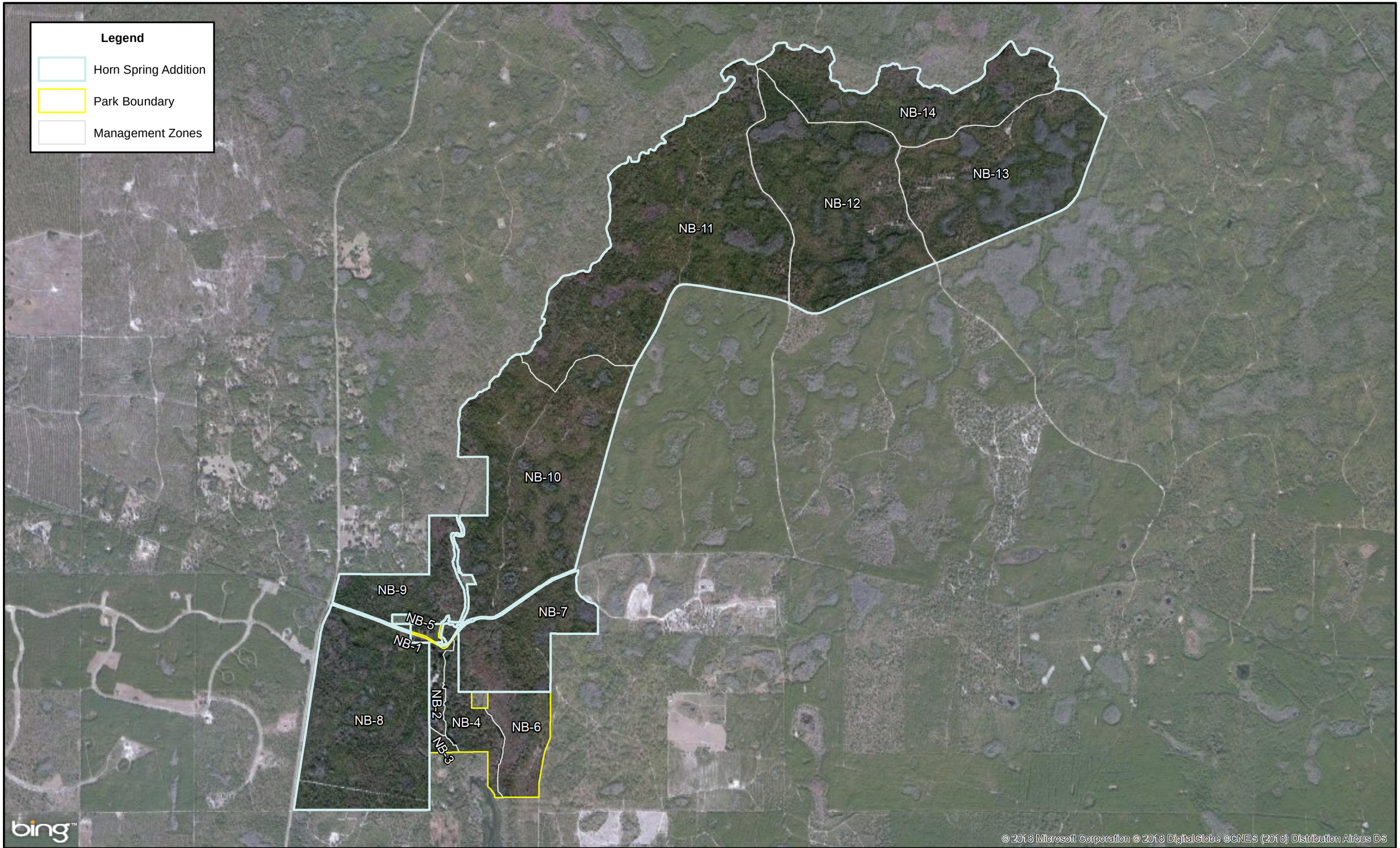
current park boundary; it is this landform, the natural bridge, that lends this park its name. Along this portion of the river's course, multiple sinkholes of varying depths may be observed; these conical depressions form when the overlying soil and rock collapse into voids in the limestone bedrock. The deeper sinkhole lakes, also referred to as karst windows, are essentially cave chambers open to the surface that have active inflows and outflows; ripples and currents are often visible on the water surface as water vents through these features. Elevation in the Natural Bridge park proper and the Horn Springs Addition ranges from about 36 feet along low sand ridges in the interior of management zones 11-14 to about 8 feet above sea level at the southernmost park boundary along the river (see Topographic Map).

Soils

According to the Natural Resources Conservation Service nine soil types are found at the Horn Springs Addition (see Soils Map). For detailed information on soils, see Appendix 4.

Soil type has a significant influence on the natural communities it is capable of supporting. In general, soils that promote rapid percolation of rainwater through their profiles support stands with vegetation adapted to periodic dry conditions, such as sandhills and mesic flatwoods; on this property, these communities tend to be underlain by Otela fine sand, Ortega sand, and Talquin fine sand. In the immediate vicinity of the St. Marks River, many stands of the alluvial forest community are underlain by Scranton sand, which interestingly consists of surface / subsurface and subsoil layers that are in fact rapidly permeable to rainwater. Drainage of groundwater toward this trough and periodic flooding is sufficient to offset this rapidly permeable property, though it also likely prevents the oxygen-poor quality that is a predominant characteristic of hydric soils. Many of the more isolated wetlands away from the immediate river valley area are underlain by the three local variants of the Tooles-Nutall fine sands associations as well as the Chipley fine sand type. Surface / subsurface soils are often rapidly permeable but the subsoil layer tends to have a low permeability. All soil types in the Horn Springs Addition tend to have surface / subsurface layers with rapid permeability and low / very low available water capacity, low to moderately low organic matter content, and low natural fertility.

Preliminary scouting of the Horn Spring parcel in preparation for this Resource Management Component did not identify areas of significant soil loss, or with a particularly high risk of erosion in the future. While this acreage has experienced a long history of economic use during the statehood years since the early 1800s, and probably had been subject to various land management strategies over the indigenous era since it lies within the Apalachee cultural area, vegetative cover on the landscape would have been intact during most years of recent decades. The upland habitats would have been occasionally cleared of pines for silvicultural harvest and then replanted in multi-decade cycles. Many portions of the upland soils had been altered in the course of the 20th century, presumably to promote timber production. The most significant alteration is the widespread bedding of the substrate in which surface soils are pushed up into slight lines to accommodate



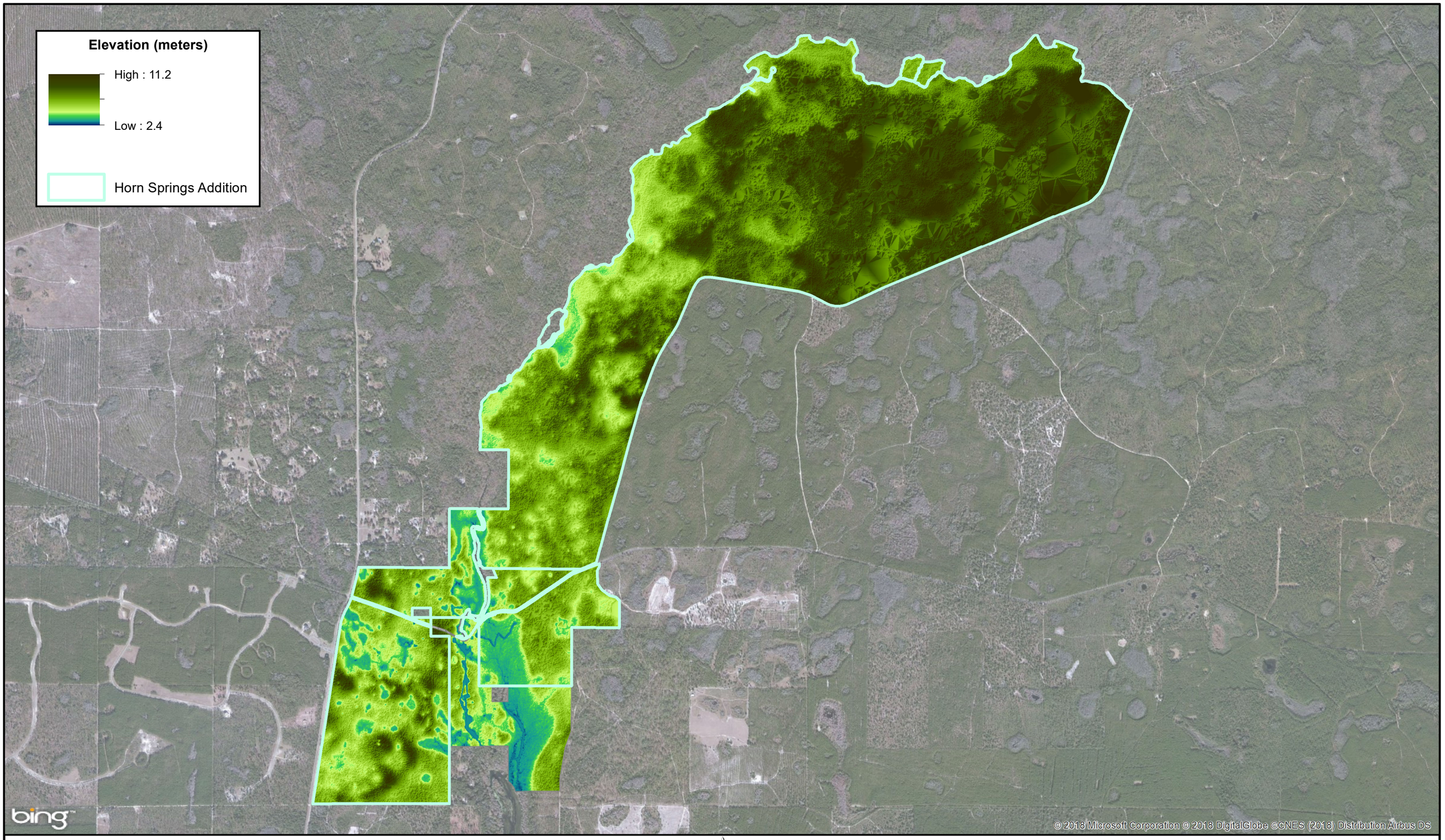
HORN SPRINGS ADDITION

NATURAL BRIDGE BATTLEFIELD
HISTORIC STATE PARK

0 750 1,500 3,000 Feet

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

MANAGEMENT ZONES MAP



HORN SPRINGS ADDITION

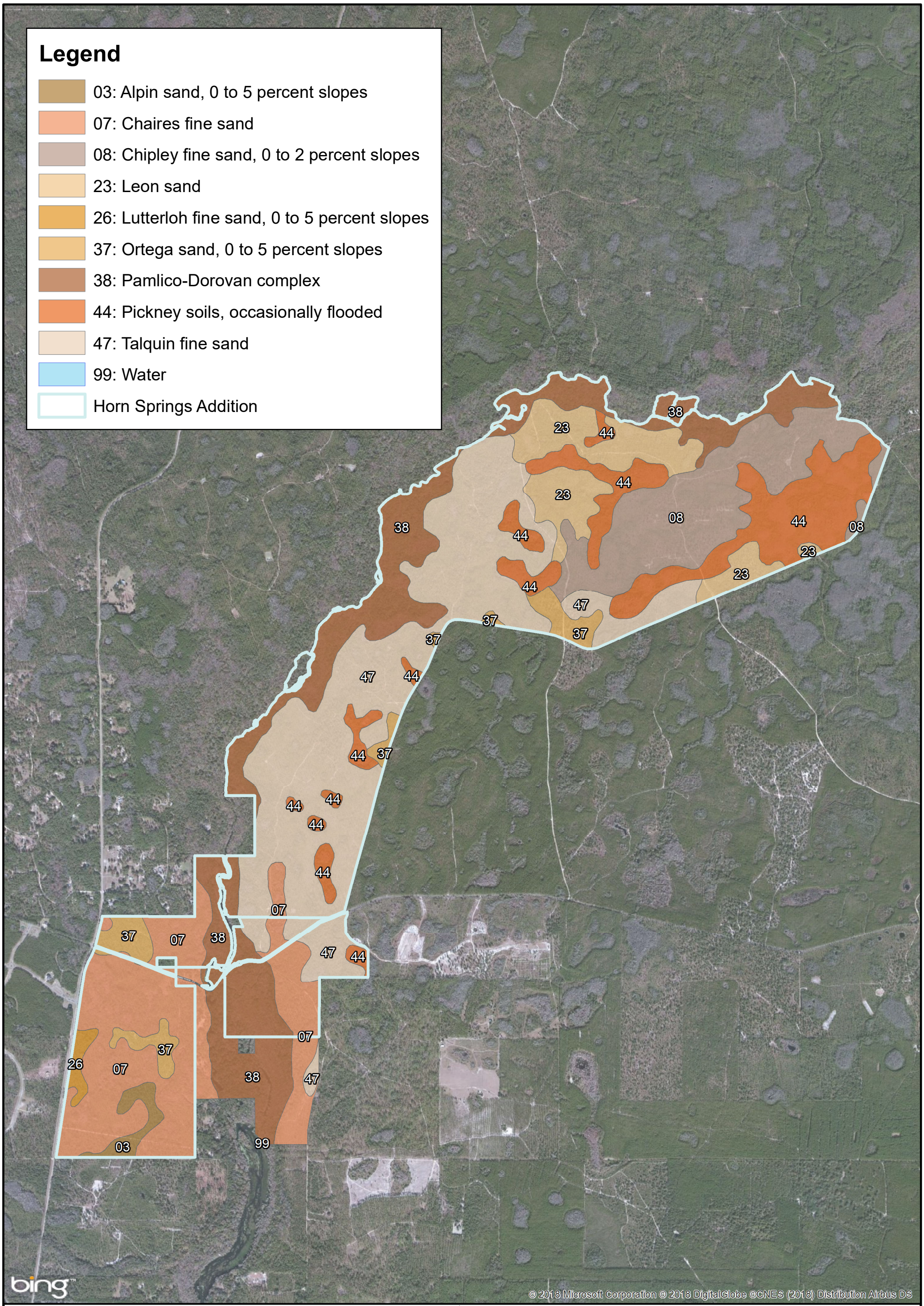
NATURAL BRIDGE BATTLEFIELD
HISTORIC STATE PARK

N

0 750 1,500 3,000 Feet

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

TOPOGRAPHIC MAP



HORN SPRINGS ADDITION

NATURAL BRIDGE BATTLEFIELD
HISTORIC STATE PARK

N

0 750 1,500 3,000 Feet

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

SOILS MAP

rows of planted pines. There is also sporadic evidence of past ditching along some of the access roads, presumably to raise the road base for accessibility, as well as portions of the interior along the northern boundary of management zone 10 (with exact purposes unclear). Floodplain habitat is dominated by hardwood forests and swamps that are not currently a focus of timber harvest; many large mature trees may be observed in these stands that have protected sediments from erosion for many years.

Substrate loss had previously been observed along an unpaved boat ramp near the now-replaced one lane bridge on Natural Bridge Road. Upgrades to the bridge and the boat ramp facility, were completed recently and both facilities are currently in excellent condition. The boat ramp area should continue to be monitored against deterioration over the next ten years. Park staff should continue to monitor for any progressive soil loss from along the river's shoreline in Management Zone NB-5 and the vicinity to the north; as these areas are regularly used for recreational shoreline fishing. In the event that a problem area is identified for restoration, a work plan would be developed and implemented. Where recommended, native vegetation should be planted in bare areas prone to erosion, particularly along shorelines. If necessary, fencing or cordons can be erected around some vulnerable shorelines to prevent visitor trampling and alleviate safety concerns.

Geology

Leon County is located along the north central boundary of the Floridan Plateau, which includes the current peninsula and surrounding submerged continental shelf down to the 300 foot bathymetric contour (Hendry and Sproul 1966; Soil Survey of Leon County 1981; Kincaid and Werner 2006). The Floridan Plateau, which was exposed during the last glacial maximum about 18,000 years ago, is composed of strata ranging in age from early Paleozoic to Recent and varies in thickness from about 5,000 feet to more than 15,000 feet. The oldest rocks are of sedimentary origin dating back to the Silurian and Ordovician periods at depths of about 7,000 feet. Mesozoic clastics and carbonates, sands, and clays extend to about 4,500 feet deep. The youngest strata are Quaternary beds dominated by sands and sandy clays and are less than 100 feet thick.

The upper layer of underlying limestone in the park is the St. Marks Formation, which was deposited about 15 million years ago during the early Miocene period. The Miccosukee and Hawthorn formations had originally overlain the St. Marks Formation, but erosion had removed these layers in subsequent years. Sediments of the St. Marks Formation are fine to medium grained, silty to sandy limestones that are normally composed of at least 90% calcium carbonate. The St. Marks Formation is exposed along the St. Marks River and in numerous sinks in this area.

Suwannee Limestone underlies the St. Marks Formation. The Suwannee Limestone is the only deposit of the Oligocene Age (30 million years old) found in Leon County. Elsewhere, it overlies the Crystal River Formation of the Jackson Stage from the Eocene Age. The Suwannee Limestone in Leon County holds the principal aquifer and most of the water wells penetrate into the formation.

Mineral Resources

There is no active mining of minerals in the park or adjacent to it.Limestone occurs in many locations beneath the sandy surface soils. Most of the limestone bedrock is itself slightly sandy, argillaceous, and partially dolomitized. These limestone deposits had been used in the past for road base and have a potential use as agricultural lime. However, the mining of limestone at this location is not considered economically viable in modern times.

Water Resources

Description and Assessment

The St. Marks River flows through the park at about the middle portion of its total length, though largely underground (Hutto and Tesar 1980). The river's course is marked by many karst features weathered into the limestone bedrock including the famous Natural Bridge and its associated aquatic cave system, swallets, and sinkhole lakes. Starting its journey in the Tallahassee Hills area of eastern Leon County, this river widens below Horn Spring and flows about 2.5 miles to the Natural Bridge, where it disappears underground until reemerging at the St. Marks River Rise about 0.6 miles downstream, just south of the current park boundary. At the St. Marks River Rise, the water flows out at an average rate of 433 cubic feet per second within its well-defined channel incised into the limestone (Barrios 2006). The river continues for about 11 miles to the south until its confluence with the Wakulla River, shortly thereafter emptying into the Gulf of Mexico. The St. Marks River traverses approximately 35 miles in total and drains 1,150 square miles within Leon, Jefferson, and Wakulla counties. Horn Spring flows out at about 12.5 cubic feet per second. By comparison, Wakulla Spring yields about 598 cubic feet per second of water.

The river is classified as a blackwater stream, which is characterized by acidic dark-colored water with a high content of particulate and dissolved organic matter derived from source wetlands. It gradually acquires more of the character of a spring-run stream as it absorbs more spring-fed water downstream and assumes a more neutral pH. For reference, the median pH value of Floridan aquifer water is 7.4, which is typical of groundwater dissolving the limestone bedrock when mixed with more acidic rain water; the St. Marks River and Wakulla River stretches generally run at about pH 7.2 (Barrios 2006). The water quality of the upper St. Marks River is generally good at the present. However, since Lake Lafayette receives stormwater runoff from Tallahassee, which in turn drains into the St. Marks River, the potential exists for water degradation resulting from increased nutrient loading and decreased oxygen concentrations as the regional population increases. The St. Marks River is classified as an Outstanding Florida Water (a Special Water). The extreme lower portion of the river far south of the park, between Rattlesnake Branch and its confluence with the Wakulla River, was polluted by petroleum residues from a former refinery and does not share the higher quality of the upper portion (Kincaid and Werner 2006).

On site, the most significant threat to the water resources within the addition would be the loss of native groundcover vegetation along the edge of the river, sinkhole lakes, and springs. This disturbance could lead to erosion and subsequent siltation of the water bodies, potentially impacting the productivity of the aquatic ecosystem in the park. To prevent this problem, shorelines in the park should be monitored for erosion resulting from visitor usage.

Horn Spring itself was subject to alterations inside the feature and around its vicinity. Most notably, the immediate approach from the southeast appears to be the former site of a hunt camp dominated by an open grassy field about a half-acre in extent with a dilapidated pavilion structure to the side. A short dock, also dilapidated, extends down the sloped edge and over the open water. The far shoreline appears to be better preserved and the alluvial forest extends to the spring edge.

One significant hydrological change to Horn Spring is the apparent siltation of a slight tributary that drained the area immediately to the east of the spring. An old unimproved road crosses this watercourse. It is now dry and vegetated so that no obvious signs of erosion are visible. FWC divers reconnoitered the bottom of the spring and reported that it is covered with a layer of sediment (possibly reducing the flow rate) and litter.

Due to the lower relief of the site and the tendency for some areas to hold floodwaters long after the rains, several spots on the existing unimproved access roads can be difficult to pass without high tire clearance and four-wheel drive. To facilitate vehicle access, designated service roads should have low water crossings (LWC) installed to provide firm traction to the wheels; and be stabilized against erosion if necessary. Unimproved roads not needed for management or recreational purposes should be abandoned and restored to the appropriate natural condition.

Resource Management Activities

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

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

Objective A: Restore natural hydrological conditions and functions to approximately 0.2 acres of spring-run stream. natural community.

Action 1 Complete hydrological assessment of Horn Spring feature.
Action 2 Execute recommended actions (e.g. dredge out sediment accumulation, recontour surrounding substrate).
Action 3 Replant margins of spring feature with native vegetation.

Drawing from the initial observations of FWC divers, a formal assessment by expert hydrologists should be conducted on Horn Spring itself. This process would analytically describe the current condition, suggest engineered solutions toward restoring this feature to a maintenance condition, and detail methods of achieving this goal. Possible procedures could include a dredging operation to remove the sediment deposition and refuse from the depression's bottom, and contouring of the sinkhole lake's depression and its sloping edges if necessary to restore natural hydrological function. The experts could also determine if the small tributary inflow should be restored for the health of this feature and the practicality of doing so. Finally, native vegetation should be planted in any areas significantly disturbed by this project.

Natural Communities

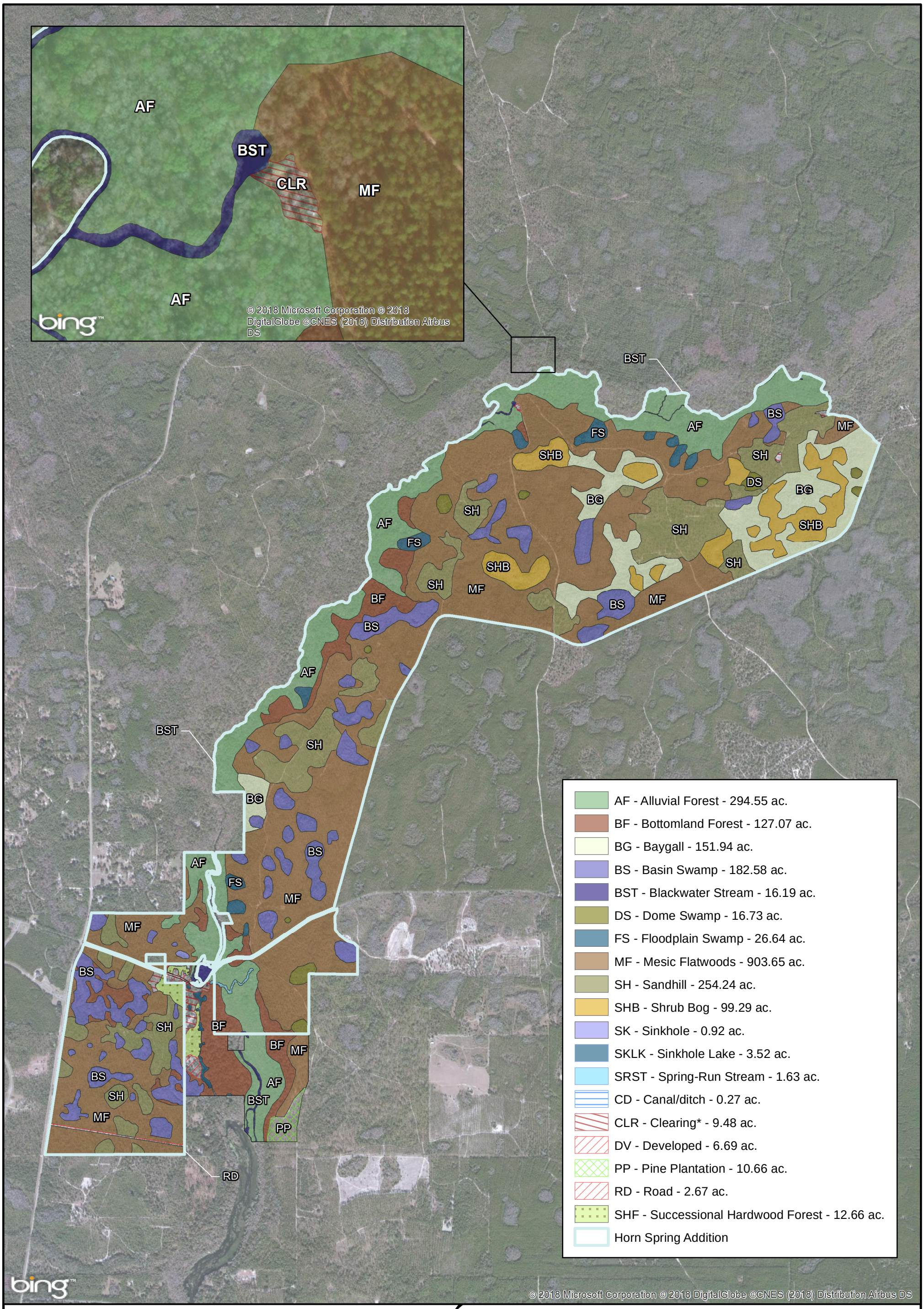
Description and Assessment

The system of classifying natural communities employed in this plan was developed by the Florida Natural Areas Inventory (FNAI). The premise of this system is that physical factors such as climate, geology, soil, hydrology and fire frequency generally determine the species composition of an area. Some physical influences, such as fire frequency, may vary from FNAI's descriptions for certain natural communities in this plan.

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

ALLUVIAL FOREST
Description and Assessment: At more than 13%, alluvial forest accounts for a large proportion of the natural communities found on the Horn Spring parcel. This community occurs along large stretches of the St. Marks River shoreline and is in good condition. Its predominant topography is flat to slightly rolling with an elevation that is only marginally higher than the water level in the river Alluvial forest usually receives floodwaters during a portion of a typical year, but the landscape generally allows adequate drainage to aerate the soils and replenish oxygen after a short time. In contrast, a floodplain swamp with lower local relief can pool water for extended periods and maintain hydric conditions with low oxygen content that biota must tolerate in order to survive.

Crawfish chimneys are abundant elements distributed throughout this community. Cypress knees are also very common ground features; in addition to bald cypress,



HORN SPRINGS ADDITION

NATURAL BRIDGE BATTLEFIELD
HISTORIC STATE PARK

0 750 1,500 3,000 Feet

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

NATURAL COMMUNITIES MAP

other hardwood tree species contribute to a diverse canopy. Most of the canopy is occupied by deciduous trees, resulting in a high degree of light penetration to the soil surface during the cooler months of the year. Nonetheless, groundcover plants and shrubs are relatively sparse over the leaf strewn forest floor and present few hindrances to walking where the ground is firm. Much of the riverbank is readily accessible to approach from the alluvial forest. Alluvial forest becomes particularly broad and virtually continuous along the ~0.6 mile of the natural bridge landform, east of the Rakestraw Tract; even though most of the river flow along this segment is subterranean, this low lying community is readily washed over by the floodwaters coming in from the north. Plant species typical of this natural community include bald cypress (*Taxodium distichum*), American elm (*Ulmus americana*), red maple (*Acer rubrum*), Walter's viburnum (*Viburnum obovatum*), American devilwood (*Osmanthus americana*), American hornbeam (*Carpinus caroliniana*), Virginia willow (*Itea virginica*), parsley hawthorn (*Crataegus marshallii*), dwarf palmetto (*Sabal minor*), wax myrtle (*Myrica cerifera*), spider lily (*Hymenocallis* sp.), butterweed (*Packera glabella*), cardinal flower (*Lobelia cardinalis*), and lizard tail (*Saururus cernua*).

This community is in maintenance condition, the primary management action required to retain this quality is exotic plant and animal control. Periodic surveys of this area should be undertaken to locate and treat invasive plants as they are encountered. Exotic plants adapted to moist shorelines [e.g. purple sesban (*Sesbania punicea*), Chinese tallow (*Sapium sebiferum*), wild taro (*Colocasia esculenta*)] would readily establish in the remote stretches of the river away from easy road access if source populations occurred nearby; park staff should monitor for the species while traveling along the river. Exotic animals, especially armadillos and feral hogs, should be removed when observed. Hog damage was not frequently observed, but the intensity of disturbance to the groundcover and soil in observed rooting areas was considerable. This represents the largest threat at this time to this natural community's conservation value.

Desired Future Condition: Alluvial forest is a seasonally flooded, closed canopy, hardwood forest that occurs on ridges or slight elevations within the floodplain of alluvial rivers. Typical overstory trees may include water hickory, American elm, sweet gum, Carolina ash (*Fraxinus carolinana*), and red maple. Understory species may include swamp dogwood, willow species (*Salix* sp.), and black cherry (*Prunus serotina*). Presence of groundcover is variable. Species such as netted chain fern and other shade tolerant herbaceous species may be present.

BASIN SWAMP
Description and Assessment: Due to the low, undulating terrain of the Horn Springs AdditionAddition, many of the broad troughs in the landscape are occupied by basin swamps. These swamps are more isolated from the St. Marks River as their floodwaters are derived from rainwater falling on or relatively close to the immediate area with some subsurface flow possible for short distances. Soils under basin swamps often consist of a hard pan or other virtually impermeable layer at or below the surface that prevents water percolation deeper into the ground. Standing water will become oxygen poor in a short time as decomposer organisms assimilate

the dissolved oxygen as they consume biomass without rapid replenishment (the diffusion rate of oxygen through liquid is slower than through a gas). These oxygen poor, saturated conditions demand specialized adaptations for the plants to withstand this environment. The canopy is typically dominated by pond cypress and tupelo trees, though the vertical structure of the trees and the outline dimensions are generally more irregular than that observed in dome swamps. Groundcover and midstory vegetative coverage is variable, though basin swamps will often be surrounded by a dense thicket of shrubby vegetation with the interior stand containing older trees and a more open profile. Preliminary observations suggest that feral hog damage was more regularly noted in the wetland communities more directly integrated into the river floodplain as opposed to the more isolated basins. Plant species observed in basin swamps includes bald cypress, pond cypress (*Taxodium ascendens*), slash pine (*Pinus elliotii*), red maple, titi (*Cyrilla racemiflora*), black titi (*Cliftonia monophylla*), sweet bay, large gallberry (*Ilex coriacea*), saw palmetto (*Serenoa repens*), fetterbush, rusty lyonia, swamp azalea (*Rhododendron viscosum*), sweet pepperbush (*Clethra alnifolia*), wax myrtle (*Myrica cerifera*), possum haw (*Viburnum nudum*), netted chain fern (*Woodwardia areolata*), royal fern, cinnamon fern, bracken fern (*Pteridium aquilinum*), lizard's tail (*Saururus cernuus*), and maiden cane (*Panicum hemitomon*).

Desired Future Condition: Basin swamps are forested basin wetlands that are highly variable in size, shape and species composition and will hold water most days of the year. While mixed species canopies are common, the dominant trees will be pond cypress and swamp tupelo. Other canopy species can include slash pine (*Pinus elliottii*), red maple, dahoon holly (*Ilex cassine*), sweetbay, loblolly bay (*Gordonia lasianthus*), and sweet gum. Depending upon fire history and hydroperiod, the understory shrub component can be distributed throughout or concentrated around the perimeter. Shrub species can include a variety of species including Virginia willow, swamp dogwood (*Cornus foemina*), wax myrtle, and titi. The herbaceous component will also be variable and may include a wide variety of species such as maidencane, ferns, arrowheads (*Sagittaria* spp.), lizard's tail, false nettle, and sphagnum moss (*Sphagnum* spp.). Soils will be typically acidic, nutrient poor peat often overlying a clay lens or other impervious layer.

BAYGALL

Description and Assessment: The baygall natural community is mainly concentrated in the northernmost portions of the Horn Springs Addition with most acreage occurring inside a few larger patches?of? this sentence seems incomplete. Since these wetter habitats rarely burn, standing biomass is dense in the understory with foliage resistant to fire. Bay trees are common in the canopy with other swampy tree species also frequent; much of the edge and interior habitat is practically impenetrable with tangled thickets of shrubs and vines. Since the ground surface is heavily shaded, herb and grass cover is sparse. Typical vegetation includes the following plant species: sweet bay, swamp bay, loblolly bay, swamp tupelo, fetterbush, rusty lyonia, titi, black titi, large gallberry, wax myrtle, red maple, Virginia willow, sweet pepperbush, and muscadine.

Desired Future Condition: Baygall consists of a wet densely forested, peat filled depression typically near the base of a slope. Seepage from adjacent uplands will maintain saturated conditions. Medium to tall trees will mainly consist of sweet bay (*Magnolia virginiana*), loblolly bay, and/or swamp bay (*Persea palustris*). Occasionally sparse pines may also exist. A thick understory consisting of gallberry (*Ilex glabra*), fetterbush (*Lyonia lucida*), dahoon (*Ilex cassine*), titi, and red maple will be typical with climbing vines such as greenbriar (*Smilax* spp.) and muscadine grape often abundant. The dominant baygall species are fire intolerant, which indicates an infrequent Optimal Fire Return Interval of 25-100 years. Frequent fires from adjacent communities should be allowed to enter the baygall ecotone during prescribed fire operations, with the staff being aware of the challenges associated with potential peat fires.

BOTTOMLAND FOREST
Description and assessment: The bottomland forest is in very good condition and contains multiple trees of exceptional girth and height. It primarily occurs adjacent to the alluvial forest stands at a slightly higher elevation where flooding is an infrequent event. Bottomland forest often occurs as a transition zone between wetlands along the river and the pyric natural communities of the upland: the mesic flatwoods and the sandhill. This is a diverse community possessing a variety of woody plants and substrate conditions.

Canopy cover tends to be fairly consistent throughout the stands, though the age distribution and spacing of individual trees is variable. Groundcover vegetation also varies a good deal with some areas more open between trees and others with relatively dense concentrations of shrubs, dwarf palmettos, and saw palmettos. Since the bottomland forest is already in maintenance condition, the primary necessity to retain this quality consists of keeping it free of exotic plants and animals. Periodic surveys of this area should be undertaken to locate and treat invasive plants as they are encountered. While the feral hog damage was not as extensive as within the alluvial forest stands during preliminary observations, this community type is adjacent to the river network and is vulnerable to higher visitation rates by the hogs; thus, it should be monitored against hog damage. The vegetation includes sweet gum, swamp chestnut oak (*Quercus michauxii*), , American holly (*Ilex opaca*), A cabbage palm (*Sabal palmetto*), common buttonbush, swamp bay, sweet bay, deer berry, fetterbush, rusty lyonia, yaupon, American strawberrybush (*Euonymus americanus*), , royal fern (*Osmunda regalis*), cinnamon fern (*Osmunda cinnamomea*), southern grape fern (*Botrychium biternatum*), w, angle pod (*Gonolobus suberosus*), jack-in-the-pulpit (*Arisaema triphyllum*), sedges, yellow stargrass, smart weed (*Polygonum* sp.), basketgrass, ebony and ladies tresses (*Spiranthes* sp.).

Desired Future Condition: This is a fairly low lying, mesic community prone to periodic flooding. Vegetation consists of a mature closed canopy of deciduous and evergreen trees. Overstory species consist of species such as sweet gum, sweet bay, water oak, live oak, swamp chestnut oak, loblolly pine, and spruce pine. The understory may be open or dense. Understory species typically include wax myrtle,

saw palmetto, and buttonbush. Presence of groundcover is variable and may consist of wood oats and various sedges.

DOME SWAMP

Description and assessment: Since this community occurs in the midst of the upland habitats, the higher elevation areas dominated by sandhill and mesic flatwoods generally envelop the dome swamps on the Horn Springs Addition. The condition of dome swamps surveyed for this plan is generally fair to good with overstory structure intact and typical for this type, though duff accumulation was substantial in many locations. Standing water present on the surface was often interspersed with mounded “islands” of vegetative debris in various states of decomposition. The fringing shrub barrier around the perimeter could also be considerable. As the prescribed fire program proceeds on the tract, the ground fires will go far toward reestablishing a more open understory and the maintenance condition. Some plant species found in dome swamps include pond cypress, swamp tupelo, slash pine, black gum, red maple, swamp bay, button bush, Dahoon holly (*Ilex cassine*), large gallberry, chaffhead, royal fern, cinnamon fern, maiden cane, and arrow arum.

Desired Future Condition: A dome swamp is an isolated, forested depression-wetland occurring within a fire maintained matrix such as a mesic flatwoods stand. The characteristic dome appearance will be created by smaller trees that grow on the outer edge (shallower water and less peat) and larger trees that grow in the interior. Pond cypress will typically dominate, but swamp tupelo may also form a pure stand or occur as a co-dominant. Other subcanopy species may include red maple, dahoon holly, swamp bay, sweetbay, and loblolly bay. Shrubs may be absent to moderate, which is a function of fire frequency, and can include Virginia willow, fetterbush, buttonbush, wax myrtle, and titi. An herbaceous component may range from absent to dense and include ferns, maidencane, sawgrass (*Cladium jamaicense*), sedges (Carex spp.), lizards tail, and sphagnum moss. Vines and epiphytes will commonly be found. Maintaining the appropriate hydrology and fire frequency is critical for preserving the structure and species composition of the community. Dome swamps should be allowed to burn on the same frequency as the adjacent fire type community, allowing fires to naturally burn across ecotones.

FLOODPLAIN SWAMP

Description and assessment: Occurring in association with and at a slightly lower elevation than the alluvial forests, the frequency of flooding is the main influence structuring plant assemblages. Since the floodplain swamps hold water for a more extended periods, vegetation in these habitats must be able to withstand periods of low oxygen availability as it is depleted in the water column by decomposer organisms. Thus, even though both communities are likely supplied by the same floodwater inputs, the longer retention time for surface water in the floodplain swamp translates to a harsher growth environment for plants. At the time of survey, woody debris from river floods in recent weeks was very abundant on the soil surface. Cypress and tupelo dominate the canopy in the swamp habitat to a greater extent than the mixed hardwood species common in the alluvial forests. Feral hog damage from their rooting and foraging in surface soil layers was also

more significant in these wet soils than in the upland habitats. Nonetheless, this damage was generally localized for the most part so that most floodplain swamp stands could be described as being in good condition. Plant species in this natural community include bald cypress, water tupelo, swamp tupelo, American elm, red maple, black gum, overcup oak, red maple, ashes, saw palmetto, common buttonbush, red mulberry (*Morus rubrum*), giant cane, walter viburnum, witch grass, angle pod, royal fern, cinnamon fern, yellow passionflower (*Passiflora lutea*), green arrow arum, lizard's tail, marsh pennywort, smartweed, nodding ladies tresses (*Spriranthes cernua*), and basket grass.

Desired Future Condition: This is a frequently or permanently-flooded community in low lying areas along streams and rivers. Soils consist of a mixture of sand, organics, and alluvial materials. Closed canopy is typically dominated by bald cypress, but commonly also includes tupelo species, water hickory, red maple, and overcup oak. Tree bases are often buttressed. The understory and groundcover is typically sparse.

MESIC FLATWOODS
Description and assessment: The sparse canopy of the mesic flatwoods is dominated by slash pine that had been planted at higher densities in some areas then thinned over the years; longleaf and loblolly pines may also occasionally be observed in the canopy. The acreage in the northernmost management zones (NB-11 to 14) is generally more fire suppressed and has very high levels of off-site hardwood biomass accumulation. Site preparation efforts, including mechanical fuel reduction with a Gyrotrac and upgrades to the access road network, would be necessary to reintroduce prescribed fires to these areas. The layout of roads and their penetration into the Horn Springs Addition mean that the network as is likely offers adequate accessibility into the interior, though many of these routes would need mowing and widening. Another pressing need for prescribed fire operations would be to construct low water crossings and better stabilize the road surface; if it has rained recently, very large puddles and loose mud spots prevent passage by most vehicles. Standing biomass is too tall and dense to safely burn right now in many areas, presenting the risk of wildfire during dry conditions, and would need one or more rounds of mechanical reduction. Portions of the interior of management zones 7 and 10, plus the southern end of 11, appear to have been more regularly burned and are much closer to maintenance condition. Mesic flatwoods along Natural Bridge Road and Planck Road west of the river are extremely burn suppressed with woody fuels reaching from the ground to the mid-canopy in many areas.

Another factor to consider in managing mesic flatwoods is the extensive bedding apparent in aerial photography of the area. Silvicultural operations frequently push surface soils up into short lines prior to replanting pines, resulting in a network of parallel "ridges" still obvious to the bird's eye view despite the vegetative coverage. Decisions on whether to flatten these features in the course of future restoration efforts would be a site-specific determination based on localized habitat conditions in the event a stand is thinned or cleared. The most common approach would be to thin the pine canopy down to a density and dispersion that approximates the

natural distribution of a mesic flatwoods stand. As the slash pine die with the passage of time, any new plantings would be of longleaf pine, which would gradually become a more dominant feature of the canopy. Common plant species in mesic flatwoods include slash pine, loblolly pine, saw palmetto, gallberry, sand blackberry (*Rubus cuneifolius*), beautyberry, coastalplain staggerbush (*Lyonia fruticosa*), St. Johns wort (*Hypericum* sp.), dwarf huckleberry (*Gaylussacia dumosa*), wiregrass, dropseed (*Sporobolus* sp.), chalky bluestem (*Andropogon virginicus* var. *glaucus*), foxglove (*Agalinis* sp.), dwarf live oak (*Quercus minima*), and dwarf huckleberry

Desired Future Condition: Longleaf pine would have been the dominant pines in northern Florida. With the region's history of logging, longleaf pines have mostly been replaced with slash pines through wide-scale planting. Native herbaceous groundcover is over at least 50 percent of the area and is generally less than three feet in height. The saw palmetto and the shrub component comprises no more than about 50 percent of the total shrub species cover, and they are less than three feet in height. Shrub species include saw palmetto, gallberry, fetterbush, runner oak, dwarf live oak, shiny blueberry and dwarf huckleberry. Shrubs are generally knee-high or less, and there are few if any large trunks of saw palmetto along the ground.

SANDHILL

Description and assessment: The highest and driest elevations in the Horn Springs Addition are occupied by sandhill natural communities. While the sandhill stands to the north and east are substantially burn suppressed, the interior of management zone 10 contains large areas of sandhill that had apparently been periodically burned and contain a vertical distribution of biomass typical for this community: high ground coverage by perennial grasses and forbs, widely scattered pines dominating the tall canopy, and midstory trees and shrubs periodically distributed across the landscape. The classic oak complement for sandhill communities (turkey oak, sand post oak, and bluejack oak) may be readily identified. Since the access roads tend to follow the highest ridges on the site, these interior roads often pass through the sandhill stands. Similar precautions previously noted for the management of the mesic flatwoods would also be observed in the sandhill natural communities.

Sandhill stands west of the St. Marks River also appear to have been burn suppressed for the longest time; fuel loads are considerable in these areas. Slash pine is the most common canopy tree species, though occasional longleaf pine and loblolly pine can also be observed. Typical plant species include sand live oak (*Quercus geminata*), turkey oak (*Quercus laevis*), bluejack oak (Quercus incana), southern red oak (*Quercus falcata*), persimmon (*Diospyros virginiana*), swamp bay, devilwood (*Osmanthus americanus*), post oak (*Quercus stellata*), beautyberry, laurel oak, deer berry, yaupon, winged sumac (*Rhus copallina*),shiny blueberry, slim-leaf pawpaw (*Asimina angustifolia*), wiregrass, *Lespedeza* sp., yellow eyed grass (*Xyris* sp.), gopher apple (*Licania michauxii*), blazing star (*Liatris* sp.), chaffhead (*Carphephorus* sp.), chalky bluestem, sneezeweed (*Helenium* sp.), narrowleaf silkgrass (*Pityopsis graminifolia*), blue curls (*Trichostema* sp.), jointweed

(*Polygonella* sp.), St, Johns wort, yellow Jessamine (*Gelsemium sempervirens*), and partridge pea.

Desired Future Condition: The dominant pine of sandhill in northern Florida will usually be longleaf pine. Herbaceous cover will be very dense, typically of wiregrass and low in stature. Most of the plant diversity is contained in the herbaceous layer that includes other three-awn grasses (*Aristida* spp.), piney-woods dropseed (*Sporobolus junceus*), lopsided Indian grass (*Sorghastrum secundum*), bluestems, and little bluestem (*Schizachyrium scoparium*). In addition to groundcover and pines, there will be scattered individual trees, clumps, or ridges of on-site oak species, usually turkey oaks, sand post oak, and blue-jack oak. In old growth conditions, sand post oaks will commonly be 150-200 years old and some turkey oaks will be over 100 years old.

SHRUB BOG

Description and assessment: Several large shrub bogs are located in the northernmost management zones (NB-11 to 13). The tree canopy is extremely sparse to absent and is composed of large slash pines or pond cypresses towering over a virtually solid coverage of dense shrub thickets dominated by titi, black titi, large gallberry, and fetterbush; one can readily resolve the long shadows of these scattered trees on aerial photography. These basin areas are underlain by impermeable hard pan layers that often hold standing water for weeks or months after the most recent rainstorms. These communities are extremely difficult to access and pass through. When field surveillance was conducted for this plan, the interior of these areas held water that became progressively deeper as one penetrates the stand from the transitional habitat along the edge, exceeding knee-depth. While the composition of these habitats prior to modern silvicultural use is unknown, it is likely that these stands had been preceded by pond cypress-dominated basin swamps. Since aerial photography does not indicate open water lying deep within the shrub bogs, rather the vegetative coverage is virtually continuous, the water level does not exceed that sufficient to permit shrub establishment.

Desired Future Condition: A shrub bog is a peat filled wetland that will often remain saturated or inundated and will occur on acidic soils. Vegetation structure may consist of dense shrubs or open and marsh like conditions with no woody species present. Typical plant species may include sphagnum moss, titi, fetterbush, buttonbush, wax myrtle, bay species, and occasionally scattered pines. The Optimal Fire Return Interval for this community is dependent on the surrounding communities. Fires from adjacent uplands should be allowed to enter the bog ecotone. This community is highly susceptible to hydrologic alteration. All hydrologic disturbances negatively impacting this community should be restored.

SINKHOLE

Description and assessment: Unlike the prominent and always water-filled sinkhole lakes just south of the roadside fence lining the Rakestraw Tract, these depressions are too shallow to hold perennial water reserves though the soil moisture content is higher than the upland communities bordering them. However, these particular

karst features are usually lined with sandy soils or sediment, and so do not provide the degree of seepage typical of limestone-walled sinkholes; they do not support the delicate and uncommon species of ferns and bryophytes found in wetter sinkholes as at Falling Waters State Park, for example. Dense shade from the tree and shrub canopy also prevents the development of significant groundcover; much of the bottom surface is covered with decaying leaves. Temporary pooling from rainwater will preclude many plants from establishing there. For the most part, species found in these sinkholes are reflective of those abundant in the locality. One notable sinkhole is a short distance north of the former staff residence on the original park parcel. It has very steep walls that drop about ten feet to a flat floor with very mossy tree stumps, topped with thick tufts of royal fern. Most of these dry sinkholes are located a short distance on either side of the river from the northern portion of the Natural Bridge. Plant species common in this habitat includes sweet gum, American elm, southern magnolia, black gum, red maple, swamp dogwood, fetterbush, high bush blueberry, parsley haw, common buttonbush, deer berry, royal fern, lizard's tail, partridge berry, sarsaparilla vine (*Smilax pumila*), muscadine, and sphagnum moss.

Desired Future Condition: Sinkholes are characterized by cylindrical or conical depressions with limestone or sand walls. Sinkholes do not contain standing water for long periods of time as do sinkhole lakes. Depending upon the age of the sinkhole, the vegetation of sandy sinkholes may be reflective of a well-developed forest stand with species such as southern magnolia, sweet gum, wax myrtle, grape vines, Virginia creeper, water oak, and pignut hickory. Sinkholes with vertical limestone walls may be covered by a variety of mosses, liverworts, ferns, and small herbs. Sinkholes will generally have a very moist microclimate due to seepage and since they are buffered by the lower elevation and tree canopy. One should limit unnatural erosion on the site and protect the micro-fauna and their habitat from disturbance.

BLACKWATER STREAM
Description and assessment: The St. Marks River and a portion of its larger tributaries are classified as blackwater stream natural communities. While it receives large inputs from notable springs along its course, including the magnitude 2 Horn Spring, the water chemistry and most of its annual input would primarily derive from surface runoff and swamp basin overflow following heavy rains. As the name indicates, blackwater streams contain appreciable quantities of tannic acids released from decaying vegetative material, particulates, dissolved organic matter, and iron. The flow rate is more variable from surface runoff derived sources versus from artesian springs, and high water periods will tend to lower the pH of the water as the influence from wetlands increases relative to groundwater inputs. Most of the shoreline is bordered by more gently sloping alluvial forest and floodplain swamp, but it will occasionally be steeper along short bluffs where it transitions to bottomland forest and drier communities.

Water quality at this point of the river is generally good, though impacts from upstream urban runoff originating in Tallahassee will likely increase over time with expanding population. A variety of wildlife (e.g., alligators, wading birds, turtles)

may be viewed on the water surface or along the shorelines. Several aquatic emergent plant species, which seasonally develop impressive flowers, can be observed along the river shallows [e.g., grassy arrowhead (*Sagittaria graminea*), spider-lily (*Hymenocallis rotata*), pickerelweed (*Pontederia cordata*), arrow arum (*Peltandra* sp.)]. Duckweed and marsh pennywort occasionally cover large expanses of the water surface where flow is limited, and scatterings of American white waterlily (*Nymphaea odorata*) may be present. Hydrilla (*Hydrilla verticillata*) can be problematic in some sections of the river; it seems to become more abundant as one travels downstream. Water lettuce (*Pistia stratioides*) and water hyacinth (*Eichhornia crassipes*) may also be observed, but they tend to be more episodic and localized in their distribution. Control of aquatic exotic plants is the most pressing issue affecting the ecological integrity of the river and its tributaries. Park staff should also monitor shorelines against the establishment of various exotic plant infestations by species such as wild taro and/or purple sesban (*Sesbania punicea*). The shoreline areas should also be monitored against erosive loss and a management plan should be drafted for corrective action if necessary.

Desired Future Condition: This community consists of perennial or intermittent watercourses originating in lowlands where extensive wetlands with organic soils collect rainfall and runoff, discharging it slowly to the watercourse. The stained waters are laden with tannins, particulates, and dissolved organic matter derived from drainage through adjacent swamps resulting in sandy bottoms overlain by organic matter. Emergent and floating vegetation may occur along the surface, but it is often limited by steep banks and dramatic seasonal fluctuations in water levels. One should minimize disturbance and alterations to the habitat and should rather preserve adjacent natural communities.

SPRING-RUN STREAM
Description and assessment: While the wetlands and surface flows in the St. Marks River drainage basin dominate its water quality as a blackwater stream, there are several spring-run streams that receive their flows almost exclusively from perennial springs supplied with groundwater from the Floridan aquifer. This deep water source is typically less influenced by the vagaries of recent weather events such as rainfall, and so will tend to release a more constant volume of water over time at a cooler temperature (66 to 75 degrees F: FNAI 2010) regardless of the season. As a matter of fact, the point on the St. Marks River where it merges with the Horn Spring stream indicates a transition from a more ephemerally flowing river with an ill-defined channel braiding between pools and wetland expanses to the north into a more distinct, consistently running waterway mostly confined to a central riverbed under average flow conditions. Water clarity is usually high (except shortly following rains) and chemistry is generally more alkaline, reflecting the influence of limestone in the bedrock. The river bottom is often sandy or limestone-dominated versus the organic matter infused sediments more commonly lining blackwater streams.

There are several impressive spring-runs just south of Natural Bridge Road on either side of the river. A large spring (likely corresponding to the name Natural Bridge Spring: Barrios 2006) just east of the river feeds a beautiful stretch of

spring-run stream flowing through alluvial forest as its rushing, clear waters support vibrantly vegetated banks until it abruptly disappears underground through a swallet that will then merge with the main St. Marks River channel just north of the Natural Bridge. There are two other very short spring-runs in management zone 8 within the forest between the parking area clearing and Planck Road that only run for a short distance before also descending into a swallet; while they have impressive spring flows along their brief lengths, these streams also unfortunately contain hydrilla infestations that presumably established in these isolated water courses after being transported underground through the subterranean cave network.

Desired Final Condition: These communities consist of perennial water courses which derive the entirety or majority of their water from limestone artesian openings of the underground aquifer. The waters will typically be cool, clear, and circum-neutral to slightly alkaline. These factors allow for optimal sunlight penetration and minimal environmental fluctuations, which promotes plant and algae growth. However, the characteristics of the water itself can change significantly downstream as surface water runoff becomes a greater factor. Areas of high flow will typically have sandy bottoms while organic materials are more likely to be concentrate around fallen trees and limbs and slow-moving pools. Typical vegetation includes eel grass (*Valisneria americana*), arrowhead arum, southern naiad (*Najas guadalupensis*), and pondweeds (*Potamogeton* spp.).

CLEARING
Description and assessment: A clearing may be found just to the west of the official parking area and bathhouse in management zone 1. It simply consists of an open area several acres in extent with a turf grass and forb dominated groundcover. When this property had been previously owned by St. Joe company, it was used in recent years to accommodate overflow parking during the Battle of Natural Bridge annual reenactment event. It is a ruderal area that would still provide a valuable park visitor resource and does not have erosion issues, exotic plants, or significant negative influences on surrounding natural communities. There are no plans to restore this area at this time.

SUCCESSIONAL HARDWOOD FOREST
Description and assessment: The area south of the bathhouse and picnic pavilion in management zone 1, containing the remains of the earthen Confederate breastworks, is dominated by a successional hardwood forest. There are very large pines towering over this site and other hardwood trees, but there are no pine seedlings or smaller stature individuals, indicating decades without recruitment. Due to fire suppression and possibly past protection efforts of this historic site, hardwood trees and shrubs have established and now dominate the ecological dynamics of this stand. There are no plans at this time to restore this area to a natural community because the cultural importance takes precedence, the earthen structures show no sign of erosion (largely on account of the existing vegetative cover) and it is limited in size. Changes to this site to facilitate historical interpretation or research needs would have the priority. Plant species observed here include water oak, laurel oak, sweet gum, southern magnolia, live oak, pignut

hickory, American holly, black gum, sassafras, devilwood, saw palmetto, dwarf palmetto, shiny blueberry, bracken fern, dwarf live oak, horse sugar, sparkleberry, flowering dogwood, Carolina holly (*Ilex ambigua*), deer berry, black cherry (*Prunus serotina*), high bush blueberry (*Vaccinium corymbosum*), wax myrtle, muscadine, cross vine, narrowleaf silkgrass, slender wood oats, dwarf huckleberry, poison ivy, broomsedge, bracken fern, elephant's foot, sarsaparilla vine, Carolina jessamine, witch grass, sedge, partridge berry, and deer lichen (*Cladina* sp.).

Resource Management Activities

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

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

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

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

Prescribed fire is planned for each burn zone on the appropriate interval. The park's burn plan is updated annually because fire management is a dynamic process. To provide adaptive responses to changing conditions, fire management requires careful planning based on annual and very specific burn objectives. In order to track fire management activities, the DRP maintains the the Natural Resource Tracking System (NRTS). NRTS allows staff to track various aspects of each park's fire management program. NRTS is used for annual burn planning which allows the DRP to document fire management goals and objectives on an annual basis. Each annual burn plan is developed to support and implement the broader objectives and actions outlined in this ten-year management plan. Each quarter reports are produced that track progress towards meeting annual burn objectives.

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

treatment of vegetation or soils and reintroduction or augmentation of native plants and animals. For the purposes of this management plan, restoration is defined as the process of assisting the recovery and natural functioning of degraded natural communities to desired future condition, including the re-establishment of biodiversity, ecological processes, vegetation structure and physical characters.

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

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

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

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

Since the DRP has just acquired the Horn Springs Addition, the property has not yet been subject to a comprehensive survey of animal and plant species inhabiting its natural communities. The preliminary scouting of these resources in preparation for this plan provides a general indication of flora and fauna, but these efforts could only cover a limited area and could potentially under-survey imperiled taxa that are, of course, too rare for regular observation. Park and district staff should work to locate collaborators that could offer skilled surveillance for different functional groups to build up a comprehensive inventory. Various agencies and organizations could lend their services to subsets of the whole (e.g. gopher tortoise survey by FWC, imperiled salamander survey by USFWS, vegetative survey by the local Native Plant Society chapter). If particular funding sources become available, then contractors could be hired to complete the surveys for focal taxa.

Objective B: Within 10 years, have 100 acres of the park maintained within the optimum fire return interval.

Action 1 Develop/update annual burn plan
Action 2 Manage fire dependent communities by burning between 287 – 573 acres annually.

Table 2 contains a list of all fire-dependent natural communities found within the park, their associated acreage and optimal fire return interval, and the annual average target for acres to be burned.

Table 2: Prescribed Fire Management		
Natural Community	**Acres**	**Optimal Fire Return Interval (Years)**
Sandhill	256	2 – 4
Mesic Flatwoods	891	2 – 4
Annual Target Acreage	287 - 573	

Since there is an abundance of sandhill and mesic flatwood acreage on this property, prescribed fire will be one of the most important natural resource management priorities. While a portion of the pyric communities in management zone 10 and the southern portion of 11 appear to have been periodically burned on some interval in the recent past, the majority of fire-type acreage to the northeast and southwest is substantially burn suppressed. The access road network provides a good start for establishing an effective burning infrastructure, but it will need to be enhanced through mowing and widening to provide containment; additional firelines will likely need to be added following targeted surveillance. Also crucial is mechanical reduction of the extensive standing fuel biomass with a Gyrotrac for at least the first one or two prescribed fires to reduce the height of flames and risk of spread to the canopy or areas outside the perimeter.

Extensive mechanical treatment is needed for some areas that appear to have been suppressed for years; the mesic flatwoods south and east of Horn Spring, as well as those between the river and Planck Road, have widespread blending of groundcover, understory, and overstory components and strong connectivity between that pyric community and adjacent wetlands. These regions will need months or even years of intensive preparation to allow for these stands to safely burn on the regular fire return interval, which means they are unlikely to be returned to a maintenance condition within this planning cycle.

One fact that may help with making progress on this task would be that the Florida Forest Service will also be managing the adjacent property along the St. Marks River and have a similar priority. Thus, the DRP and FFS could potentially collaborate on joint prescribed fire operations involving, for example, helicopter-based ignition, large-scale Gyrotrac projects, and prescribed burns staffed with larger numbers of personnel than usual.

In terms of returning pyric natural communities to a maintenance condition, those areas of NB-10 and 11 referred to above and here estimated to consist of about 100 acres, would be the furthest along in burning and the easiest to reach this state during this planning cycle. Note that while the Optimal Fire Return Interval indicated in Table 2 for both natural communities is 2 to 4 years, the DRP would strive toward aiming its fire operations during year 3 of that interval (depending on climatic factors and other logistical constraints).

Imperiled Species

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

During the preliminary scouting for this plan, four plant species with state-level imperiled status were observed on the Horn Springs Addition. Angle pod (*Gonolobus suberosus*) is a threatened species that was repeatedly located in the groundcover vegetation of the bottomland forests. This species is a rather delicate slender vine with broad leaves typically found in mature hardwood-dominated stands that have lacked significant influence from fire for decades. It is not unusual to find this species in high quality habitat, and maintaining that quality is generally sufficient to conserving the species. Cardinal flower (*Lobelia cardinalis*) may be observed along the wet soils at the river's shoreline and in the floodplain swamps and alluvial forests. Its brilliant red flowers are a common sight for canoe and kayak paddlers. Protecting the wetland habitats from disturbance is the best way to preserve this threatened species in the park. Royal fern and cinnamon fern are both considered to be imperiled by FDACS due to having been commercially exploited (CE) in the past. Both species are frequent in moist soil habitats that are protected from frequent disturbance.

Two other imperiled animal species were observed so far on the Horn Springs Addition. The American alligator has state and federal levels of protection and is abundant in the various watercourses and bodies across the landscape. As a matter of fact, a medium sized alligator has been observed on multiple occasions by DRP staff visiting the Horn Spring pool for different purposes. To prevent adverse encounters between park visitors and alligators, signage and/or kiosks should be posted around water use areas (e.g. close to the Horn Spring pool, St. Marks River shorelines near the original park at Natural Bridge Road, selected sinkhole lakes on the Rakestraw Tract). If any particular alligator becomes problematic or threatening to park visitors, park staff should consult with FWC on further preventative action. Wood storks are currently listed as federally-threatened, though this species had been considered to be endangered only several years ago. Park staff has observed this species foraging and roosting in groups along the river and its tributaries. While it is not known to be breeding at this location, the Horn Springs Addition would offer these birds with feeding territory, adequate cover, and possibly one of the few significant rivers in this region without appreciable boat traffic along its length.

As park staff become more familiar with the Horn Springs Addition, they would have future opportunities to note any additional imperiled species present on the property and their habitat preferences. Also, the comprehensive species surveys would allow this imperiled species inventory to be expanded. There are surely other taxa not yet identified on the property. For example, some of the more open and recently burned upland communities would contain excellent habitat for gopher tortoises that should only improve and increase as the park's prescribed fire

program progresses. However, burrows were not observed during the preliminary scouting done recently for this section, so they were excluded from the table until verified. In other locations of the state, one may find tracts of conservation land with high quality foraging and nesting opportunities for gopher tortoises but with few to no known individuals on account of past hunting or land management practices on adjacent properties.

Table 3 contains a list of all known imperiled species within the park and identifies their status as defined by various authorities. It also identifies the types of management actions that are currently being taken by DRP staff or others, and identifies the current level of monitoring effort. The codes used under the column headings for management actions and monitoring level are defined below the table. Explanations for federal and state status as well as FNAI global and state rank are provided in Appendix 6.

Table 3: Imperiled Species Inventory

Common and *Scientific Name*	**Imperiled Species Status**				**Management Actions**	**Monitoring Level**
	FWC	**USFWS**	**FDACS**	**FNAI**		
PLANTS						
Angle pod *Gonolobus suberosus*			LT	G2,S2	2,10	Tier 1
Cardinal flower *Lobelia cardinalis*			LT		2,10	Tier 1
Cinnamon fern *Osmunda cinnamomea*			CE		2,10	Tier 1
Royal fern *Osmunda regalis*			CE		2,10	Tier 1
REPTILES						
American alligator *Alligator mississippiensis*	FT (S/A)	T (S/A)		G5,S4	2,10, 13	Tier 1
BIRDS						
Wood stork *Mycteria Americana*	ST	FT		G4,S2	2,10, 13	Tier 1

Management Actions:

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

Monitoring Level:

Tier 1.	Non-Targeted Observation/Documentation: includes documentation of species presence through casual/passive observation during routine park activities (i.e., not conducting species-specific searches). Documentation may be in the form of Wildlife Observation Forms, or other district specific methods used to communicate observations.
Tier 2.	Targeted Presence/Absence: includes monitoring methods/activities that are specifically intended to document presence/absence of a particular species or suite of species.
Tier 3.	Population Estimate/Index: an approximation of the true population size or population index based on a widely accepted method of sampling.
Tier 4.	Population Census: A complete count of an entire population with demographic analysis, including mortality, reproduction, emigration, and immigration.
Tier 5.	Other: may include habitat assessments for a particular species or suite of species or any other specific methods used as indicators to gather information about a particular species.

Resource Management Activities

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

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

In the preparation of this management plan, DRP staff consulted with staff of the FWC's Imperiled Species Management Section or that agency's Regional Biologist and other appropriate federal, state and local agencies for assistance in developing imperiled animal species management objectives and actions. Likewise, for imperiled plant species, DRP staff consulted with FDACS. Data collected by the USFWS, FWC, FDACS and FNAI as part of their ongoing research and monitoring

programs will be reviewed by park staff periodically to inform management of decisions that may impact imperiled species in the park.

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

Action 1 Develop full inventory of imperiled species on the Horn Springs Addition.

Action 2 Verify gopher tortoise population presence and begin monitoring efforts for active burrows.

Objective A under the Restoration Section above also addresses the need to create an inventory of animal and plant species, both imperiled and common, on the Tract to more effectively direct land management efforts to improve foraging and nesting resources available to them. For this item, part of the larger survey effort would be a targeted search for evidence of current gopher tortoise population occupation of the site, initial burrow locations, and any other data that could be used to estimate population parameters or potential carrying capacity for this site. Post-burn surveys could take advantage of low vegetative cover in focal habitat to map active or dormant gopher tortoise burrows. Secondary priority areas to search would be on the burn-suppressed portions of the sandhill and mesic flatwoods communities on both sides of the river. While it is doubtful for the current planning cycle given the prescribed fire needs and uncertainty about the population status, the acreage of the Horn Spring parcel and possibly some of the neighboring properties would likely surpass the 40 acre threshold of high quality habitat to support a gopher tortoise reintroduction program in cooperation with FWC. This determination would be made at the beginning of the next planning cycle.

Exotic and Nuisance Species

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

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

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

case basis in accordance with the DRP's Nuisance and Exotic Animal Removal Standard.

Preliminary scouting for exotic plant infestations located three problem species: Japanese climbing fern (*Lygodium japonicum*), showy rattlebox (*Crotalaria spectabilis*; no FLEPPC status), and hydrilla (*Hydrilla verticillata*). Japanese climbing fern was sparsely scattered at low densities along the main interior access road leading up to Horn Spring itself, starting from its intersection with the larger road running along the upper eastern boundary and extending to the spring. It was not observed growing beyond the immediate road shoulder. Its initial establishment could have been a recent event, and it was infrequent and not extensive where it did occur. Several subsequent treatments by park staff could likely bring it to a maintenance condition. A clump of showy rattlebox plants was located in October 2017 on a cement chunk / spoil mound along the side of the main eastern boundary road, about a half mile north of Natural Bridge Road. DRP staff members hand pulled about one hundred individuals large and small. Though some fruits had already matured and dispersed, a substantial portion of the seed crop was prevented from completing development. This rattlebox patch appeared to be limited to the spoil mound, but other similar roadside disturbance areas should be monitored for exotic plant infestations. This rattlebox patch should also be checked and treated several times per year to ensure the seed bank is depleted.

The most serious exotic plant control issue on the Horn Spring parcel is the hydrilla infestation affecting the St. Marks River and major tributaries / connections. Periodic blooms of hydrilla, and to a lesser extent water lettuce (*Pistia stratiotes*) and water hyacinth (*Eichhornia crassipes*), have been noted along the rivershore of the original park parcel (management zone 5) for quite a while, but DRP land acquisitions in recent years that now include locally infested waterways have emphasized the larger problem on this river system. While it is likely not practical for the DRP to eradicate all infestations along the course of the river where it is adjacent to relatively remote stretches of park property, a priority natural management necessity is to reduce the thick clumps of hydrilla along spring pools and short spring-runs if possible, including Horn Spring itself and other distinctive spring features south of Natural Bridge Road.

The DRP will consult with the Florida Fish and Wildlife Conservation Commission – Invasive Plant Management Section (FWC-IPMS) regarding potential resources and effective strategies for confronting the hydrilla infestation of the springs. Two issues with these infestations include the fact that these would not be considered navigable waters (for purposes of IPMS jurisdiction) and potential funds IPMS allocates to exotic plant control in upland habitats would not apply. Nonetheless, a potential economical approach to reducing these clumps could involve park staffers dispersing Aquathol (herbicide) granules onto the hydrilla foliage several times during the growing season. It would not eliminate the source populations elsewhere along the river but bringing the spring features to a maintenance condition, with retreatments when needed, could be an achievable goal.

Similar to the Natural Bridge park property, armadillos should be removed when the opportunity presents itself. These animals are native to Latin America and can disturb native groundcover plants and soils when they root around and forage for small prey items, such as insects and lizards.

Feral hog damage was noted to be a more significant problem for the plants and moist soils of the alluvial forests, bottomland forests, and floodplain swamps that occur along the St. Marks River corridor. Comparable damage was not observed in the basin swamps that were more isolated from the river network, presumably from lower visitation rates, though more extensive scouting in the future would be needed to determine if this is truly the case.

The feral hog issue can be difficult to address given the larger-scale disturbance damage to the natural resources as well as the large regional population that is unhindered from dispersing throughout the landscape and recolonizing conservation properties. However, hogs must be periodically removed from the parcel to limit the damage as much as possible. Park staff should work to reduce the local hog population through trapping efforts; if funds are available, USDA contractors could be hired to visit the parcel and conduct sweeps.

Table 4 contains a list of the Florida Exotic Pest Plant Council (FLEPPC) Category I and II invasive, exotic plant species found within the park (FLEPPC, 2011). The table also identifies relative distribution for each species and the management zones in which they are known to occur. An explanation of the codes is provided following the table. For an inventory of all exotic species found within the park, see Appendix 5.

Table 4. Inventory of FLEPPC Category I and II Exotic Plant Species

Common and *Scientific* Name	**FLEPPC Category**	**Distribution**	**Management Zone**
PLANTS			
Water hyacinth *Eichhornia crassipes*	I	3	9,10
Hydrilla *Hydrilla verticillata*	I	3	7,8,9,10,11,14
Japanese climbing fern *Lygodium japonicum*	I	2	11,12
Water lettuce *Pistia stratiotes*	I	0	9,10

Distribution Categories:

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

4 = Dominant cover: Multiple plants or clumps of a single species that occupy a majority of the gross area infested.

5 = Dense monoculture: Generally, a dense stand of a single dominant species that not only occupies more than a majority of the gross area infested, but also covers/excludes other plants.

6 = Linearly scattered: Plants or clumps of a single species generally scattered along a linear feature, such as a road, trail, property line, ditch, ridge, slough, etc. within the gross area infested.

Plant and Animal Disease and Nuisance Insects

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

Mosquito control occurs on some state parks. All DRP lands are designated as "environmentally sensitive and biologically highly productive" in accordance with Section 388.4111, Florida Statutes. If a local mosquito control district proposes treatment, the DRP works with them to adopt a mutually agreeable plan. By policy of the DEP since 1987, treatment plans may not include aerial adulticiding but typically allow larviciding. DRP policy also allows park managers to request typical truck spraying (adulticide fogging) in public use areas even in the absence of a treatment plan. The DRP does not authorize new physical alterations of marshes through ditching or water control structures. Mosquito control plans temporarily may be set aside under declared threats to public or animal health, or during a Governor's Emergency Proclamation. Should Leon County initiate mosquito control operations at this park, a general arthropod management plan drafted in 1987 would guide these activities. A copy of the draft Arthropod Control plan is available upon request.

Resource Management Activities

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

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

Objective A: Annually treat one infested acre of exotic plant species in the park.

Action 1 Annually develop/update exotic plant management work plan.

Action 2 Implement annual work plan by treating one acre in park, annually, and continuing maintenance and follow-up treatments, as needed.

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

more accurately estimates the actual acres of plants removed (DRP Invasive Exotic Plant Protocol 2013).

As mentioned in the Description above, small and scattered roadside recurrent infestations of Japanese climbing fern and showy rattlebox should be scouted for along the access road margins and treated by park when necessary. The one infested acre listed in Objective A refers to the approximate acreage occupied by dense hydrilla patches within some of the spring pools and spring-runs. Principal target areas include the Horn Spring pool and some of the more isolated karst features south of Natural Bridge Road and west of the Rakestraw Tract. These areas would likely be treated by park staffers using Aquathol granules unless other funding sources or contracting services can be arranged. As these infestations are brought into a maintenance condition, annual treatment acreage would be expected to decrease over time.

Objective B: Implement control measures on two exotic animal species in the Horn Springs Addition, feral hogs and armadillos.

Armadillos should be removed from the park by staffers as encountered to prevent the soil disturbance that their rooting behavior promotes. Park staff should initiate a program to trap feral hogs that had been causing disturbance primarily to some of the wetland communities connected to the St. Marks River system. If funding is available, then contracts with USDA trappers or other parties should be pursued in order to work toward reducing the hog population impacting the natural resources in the Horn Spring parcel.

Special Natural Features

The Horn Springs Addition property contains ten springs, including Hom Spring, for which the property is named. Hom Spring reaches a depth of 22 feet deep and is located approximately two miles north of Natural Bridge Road. Additionally, there are three other springs in this same vicinity named Little Hom Spring #1, 2, and 3, that connect into the St. Marks River.

South of Natural Bridge Road, there are six additional springs. These springs are named Rhodes Springs #1 and 4, Natural Bridge Spring (a/k/a Jim French Spring), Natural Bridge Spring #2, and Gerrell Spring #4 and 5. The Natural Bridge Spring is approximately 33 feet deep. The spring run is approximately 6 feet deep and flows swiftly over a limestone and sand bottom. The majority of the spring water run flows southwest to the St. Marks River and disappears into a siphon spring and then flows underground, then re-emerges in the spring run and again flows into a siphon spring underground. The St. Marks River, re-emerges approximately a mile away at St. Marks River Rise or St. Marks River Spring.

This complex mosaic of active karst and riverine features is considered one of the unique and defining features of Natural Bridge Battlefield Historic State Park.

Cultural Resources

Description and Assessment

This section addresses the cultural resources present in the park that may include archaeological sites, historic buildings and structures, cultural landscapes and collections. The Florida Department of State (FDOS) maintains the master inventory of such resources through the Florida Master Site File (FMSF). The DRP maintains the master inventory of its collections. Section 267.061, F.S., requires that all state agencies locate, inventory and evaluate cultural resources that appear to be eligible for listing in the National Register of Historic Places (NRHP). Appendix 8 contains the FDOS, Division of Historical Resources (DHR) management procedures for archaeological and historical sites and properties on state-owned or controlled properties; the criteria used for evaluating eligibility for listing in the National Register of Historic Places (NHRP), and the Secretary of the Interior's definitions for the various preservation treatments (restoration, rehabilitation, reconstruction and preservation). For the purposes of this plan, the term "significant" refers to those cultural resources listed, eligible for listing or potentially eligible for listing in the NRHP. To be eligible for listing, cultural resources must be at least 50 years old or of exceptional importance if younger. This plan includes cultural resources that are at least 50 years old or of exceptional importance or that will reach 50 years of age during the term of this plan.

Evaluating the condition of cultural resources is accomplished using a three-part evaluation scale, expressed as good, fair and poor. These terms consider the site's current level of stability and the rate and amount of decline in its condition. The rating is not a comparison of the site's present condition to an idealized condition. "Good" describes a condition of structural stability and physical wholeness, where no obvious deterioration other than normal occurs. "Fair" describes a condition in which there is a discernible decline in condition between inspections, and the wholeness or physical integrity is and continues to be threatened by factors other than normal wear. A fair assessment is usually a cause for concern. "Poor" describes an unstable condition where there is palpable, accelerating decline, and physical integrity is being compromised quickly. A resource in poor condition suffers obvious declines in physical integrity from year to year. A poor condition suggests immediate action is needed to reestablish physical stability.

Table 5 contains the name, FMSF number, cultural or temporal period and cultural resource type (FMSF category) of all the cultural sites within the park that are listed in the FMSF. The table also summarizes each site's level of significance, present condition and recommended preservation treatment. An explanation of the codes is provided below the table.

Table 5: Cultural Sites Listed in the Florida Master Site File					
Site Name and FMSF #	**Cultural/Temporal Period**	**Resource Type**	**Significance**	**Condition**	**Treatment**
Natural Bridge Road 8LE5731	19th/20th Century	Historic structure	NR	Good	P
Natural Bridge Road bridge (dismantled) 8LE5792	20th Century	Historic structure	NE	NA	N/A
Natural Bridge Site 8LE188	Prehistoric, Civil War, 19th/20th Century	Archaeological Site	NR	Good	P
Natural Bridge 1 8LE0008	Prehistoric	Archaeological Site	II	G	P
Natural Bridge 2 8LE00045	Prehistoric	Archaeological Site	II	G	P
NN 8LE00160	Weeden Island	Archaeological Site	II	G	P
NN 8LE00486	Weeden Island / Fort Walton	Archaeological Site	II	G	P
NN 8LE00487	Deptford	Archaeological Site	II	G	P
NN 8LE00488	Prehistoric	Archaeological Site	II	G	P
NN 8LE00506	Prehistoric	Archaeological Site	II	G	P
NN 8LE00523	Prehistoric	Archaeological Site	II	G	P

Significance:
- NRL National Register listed
- NR National Register e ligible
- NE Not evaluated
- NS Not significant
- II Insufficent Information

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

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

Prehistoric and Historic Archaeological Sites

Description and Assessment:
FMSF item 8LE188 describes the entire Natural Bridge site in its totality, which extends beyond the original parcel and the Rakestraw Tract. With the acquisition of

the Horn Springs Addition, all parts of this cultural area are now preserved on park property. Artifacts found within this area represent their origins from a variety of time periods: the indigenous era (unknown prehistoric times or during definite cultural periods, such as Weeden Island, Deptford, and Fort Walton), 19th century (especially Civil War), and 20th century. Arbuthnot et al. (2010) report that their phase I archaeological survey of the battlefield on park property yielded many artifacts from this range of periods. Their methodology consisted of a pedestrian inspection of the ground surface, subterranean shovel tests on a regularly spaced grid system (small pits excavated at 25 meter intervals in upland areas and sifted through screens) and in "zones of special interest", and metal detector surveys conducted at varying degrees of intensity based on surface features. Items found included aboriginal lithics (of or relating to stone tools) and pottery sherds, civil war munitions, and various modern items (e.g., glass pieces, dinnerware fragments, nails/screws/bolts, coins, fishing items). An extensive literature review from multiple sources and interviews with local residents provided a wealth of information about the context of this site. The authors also recommended that two sites previously listed in the FMSF should be deleted since they describe elements that are fully contained within this item: the natural bridge itself (8LE9) and the Rakestraw Field (8LE5698).

Even though the Horn Springs Addition has only been under the management of the DRP for several months, many cultural sites had been located on this property when it was owned by the St. Joe Company. These sites mostly correspond to low density artifact scatters of lithics or ceramics left by indigenous people. Many were either located during ground-disturbing land management activities, especially site preparation for pine planting, or after the fact following discovery by experts along roads and other corridors or at other points of interest. Most are located just beyond the present boundaries of the original parcel and Rakestraw Tract, but sites had also been located close to Horn Spring and the access roads leading up to it.

Three smaller-scale cultural surveys had been executed in areas close to Natural Bridge Road and the northern portion of the Rakestraw Tract. Cremer (2010) conducted pedestrian inspections, regular interval shovel testing, and metal detecting to describe artifacts sampled from a two-acre test area on property west of the bridge; this project collected artifacts likely dating from the Civil War battle, including an iron shell fragment, shot (minie balls and cannister), a canteen stopper, and a metal band. Porter (2009) reported on an Archaeological Resources Management Training Exercise consisting of a transect of shovel tests along the western fenced boundary of the Rakestraw Tract. Most items were tertiary and secondary stone waste flakes from tool production, but a few reworked bifacial scrapers were also located. Keel (2011) reported on a survey effort associated with the bridge replacement project that collected 13 shovel tests spaced 100 feet apart; no significant artifacts were recovered from this zone, which is subject to periodic river floods.

Desired Future Condition: All significant archaeological sites within the park that represent Florida's cultural periods or significant historic events or persons are

preserved in good condition in perpetuity, protected from physical threats and interpreted to the public.

Resource Management Activities

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

The management of cultural resources is often complicated because these resources are irreplaceable and extremely vulnerable to disturbances. The advice of preservation and archaeological experts is required in this effort. All activities related to land clearing, ground disturbing activities, major repairs or additions to historic structures listed or eligible for listing in the NRHP must be submitted to the FDOS, Division of Historical Resources (DHR) for review and comment prior to undertaking the proposed project. DHR recommendations may include, but are not limited to concurrence with the project as submitted, monitoring of the project by a certified archaeological monitor, cultural resource assessment survey by a qualified professional archaeologist or modifications to the proposed project to avoid or mitigate potential adverse effect. In addition, any demolition or substantial alteration to any historic structure or resource must be submitted to the DHR for consultation and the DRP must demonstrate that there is no feasible alternative to removal and must provide a strategy for documentation or salvage of the resource. Section 267.061, F.S., further requires that the DRP consider the reuse of historic buildings in the park in lieu of new construction and must undertake a cost comparison of new development versus rehabilitation of a building before electing to construct a new or replacement building. This comparison must be accomplished with the assistance of the DHR.

Objective A: Assess and evaluate the physical condition of 8 cultural resources in the park.

Action 1 Complete DRP condition assessment of archaeological sites.

Over the next planning cycle, park staffers should assess and evaluate eight archaeological sites primarily consisting of scatterings of indigenous lithics and ceramics were found on the Horn Springs Addition property on either side of the river as well as along the road to Horn Spring itself. While the specific locations of the lithic scatter sites are not always well recorded on the FMSF documents, park staff should attempt to find them or determine whether the immediate vicinity is experiencing erosion or another risk to the site's integrity.

Two items on Table 4 can be disregarded for this objective, including the Natural Bridge Road bridge (built in 1938 and dismantled several years ago in favor of a replacement) and Natural Bridge Road itself (this is a Leon County feature maintained by their transportation department personnel).

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

Action 1 Ensure all known archaeological sites, historic structures and cultural landscapes are recorded or updated in the Florida Master Site File.

Action 2 Complete archaeological sensitivity model for the Horn Spring parcel acreage.

Action 3 Arrange for follow up archaeological surveys of park property based on knowledge gained from previous projects.

As park staff become more familiar with the Horn Springs Addition, it is possible that other cultural resource sites may be discovered; new sites or refinements to previous documentation should be updated accordingly in the FMSF. Natural Bridge park proper was subjected to an archaeological resource sensitivity modeling analysis by personnel at the University of South Florida to determine locations with a higher probability of containing historic artifacts (Collins et al. 2012); this information can be used to guide future efforts. If the opportunity arises, the Horn Springs Addition could also be examined in a similar future analysis. If significant target areas are discovered that had not been previously surveyed by Arbuthnot et al. (2010) or other projects, arrangements should be made for further archeological excavation by agency experts, academics, or contractors. One area that may be fertile ground for a cultural survey would be the immediate vicinity of Horn Spring, the clearing, and the nearby dilapidated bridge spanning the river.

Special Management Considerations

Timber Management Analysis

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

Since this park is now beyond the 1,000-acre threshold established by Section 253.036, F.S., a timber management plan will be drafted to guide future land management decisions. An assessment of forest stands on the Horn Springs Addition will advise staff about potential ecological restoration projects for the future.

Resource Management Schedule

A priority schedule for conducting all management activities that is based on the purposes for which these lands were acquired, and to enhance the resource values, is located in the Implementation Component of this management plan amendment. Upon approval, this priority schedule will be amended to the February 26, 2016 approved plan.

Land Management Review

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

This property has not been the subject of a Land Management Review.

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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, and then proceeds through the creation of a conceptual land use plan to guide the location and extent of future park development. Input to the plan is provided by experts in environmental sciences, cultural resources, park operation and management, and through public workshops, and user groups. With this approach, the DRP objective is to provide quality development for resource-based recreation with a high level of sensitivity to the natural and cultural resources at each park throughout the state.

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, regional demographics, adjacent land uses and park interaction with other facilities.

The Horn Springs Addition to the Natural Bridge Battlefield Historic State Park is located within Leon County**,** about 15 miles southeast of Tallahassee and approximately six miles east of the town of Woodville, on Natural Bridge Road. The property is a critical component of a planned conservation corridor extending from Tallahassee to the Gulf of Mexico and part of an expanding network of connected conservation lands managed by various local, state and federal entities.

Fishing and boating are popular pursuits on the St. Marks River, which flows underground at the park’s namesake Natural Bridge. The property is in close

proximity to the Tallahassee-St. Marks Historic Railroad State Trail that is a popular place for bicycling, roller-skating, walking and jogging. L.Kirk Edwards Wildlife Management Area, Old Plank State Forest and the St. Marks River Preserve State Park are located directly north of Natural Bridge Battlefield Historic State Park. The park is also within a short drive of Edward Ball Wakulla Springs State Park, San Marcos de Apalache Historic State Park, Apalachicola National Forest and Wakulla State Forest.

Table 6 identifies significant resource-based recreation opportunities within 15 miles of Natural Bridge Battlefield Historic State Park.

Table 6. Resource-Based Recreational Opportunities

Name	Biking	Hiking	Swimming	Boating / Paddling	Fishing	Wildlife Viewing	Overnight Stay	Hunting	Equestrian Facilities
Tom Brown Park (City of Tallahassee)	✓	✓				✓			
Lafayette Heritage Trail Park (City of Tallahassee)	✓	✓		✓	✓	✓			✓
Old Plank State Forest		✓			✓	✓		✓	
J.R. Alford Greenway (Leon County)	✓	✓				✓			✓
L. Kirk Edwards Wildlife and Environmental Management Area (FWC)		✓		✓	✓	✓		✓	
Aucilla Wildlife Management Area (FWC)	✓	✓		✓	✓	✓	✓	✓	
Wood Sink/Fanlew Preserve (Private)									
St. Mark's National Wildlife Refuge (USFWS)	✓	✓		✓	✓	✓	✓	✓	✓
St. Mark's River Preserve State Park (FDEP)	✓	✓			✓	✓			✓
Edward Ball Wakulla Springs State Park (FDEP)	✓	✓	✓			✓			✓
Tallahassee St. Mark's State Trail	✓	✓				✓			✓

Existing and Planned Use of Adjacent Lands

Natural Bridge Road runs east-west through the park. Public access is available to the park via a parking area just south of Natural Bridge Road on the west side of the St. Mark's River. The road has been paved east to the Jefferson County line and receives sparse local traffic.

Much of the land due north of the park is associated with the St. Marks River floodplain and is unsuitable for development. Less than one half mile northwest of the park is a single-family residential development. A lumber company still owns most of the land surrounding the park to the east. The Florida Forest Service (FFS) manages Old Plank State Forest, located on the west side of the river and extending westward to Old Plank Road. This includes land directly across the river from Horn Springs. The FFS has designated a 500-ft. no-hunting buffer on the west side of the river within the state forest, centered on the area around the Horn Springs Complex.

The entire park boundary is located within unincorporated Leon County (Leon County 2014). The current zoning is Rural, as are the lands adjacent to the park boundary. With this zoning, very low residential density and minimal commercial development is allowed, as well as passive recreational land uses. The single-family residential development northwest of the park is designated as "Residential Preservation" (Leon County 2014). Future development of this area is limited to only adding residential units within the confines of the existing residential area. Additional residential development is anticipated on undeveloped private lands around the park as the city of Woodville and nearby Wakulla County continues to grow. Potential impacts from additional development could include a decrease in the quality and supply of ground and surface water.

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
Upland areas within the Horn Springs Addition are dominated by mesic flatwoods and sandhill. The upland areas within the addition are suitable for resource-based recreation development and resource interpretation.

The property is largely characterized by broad areas of alluvial forest that lie along the upper St. Mark's River and other wetland areas such as bottomland forest, floodplain swamp, blackwater stream, and spring -run streams. These ecological sensitive areas not generally suited for recreational use, however limited access for interpretive purposes may be accommodated through the careful use of boardwalks and overlooks.

Water Area
From the Tallahassee Hills area of eastern Leon County, the St. Marks River widens and flows about 2.5 miles southward to the Natural Bridge, where it disappears underground until reemerging at the St. Marks River Rise, 0.6 miles downstream. At the park, the river flows at a relatively low average flow rate, providing opportunity for paddlers to paddle upstream above Natural Bridge toward Horn Springs. Stretches of the river north of Horn Spring are difficult to navigate due the character of the vegetation, water levels and numerous portages.

Shoreline
The banks of the St. Marks River provide opportunity for shoreline fishing. Fishing platforms and boardwalks will provide optimal access to fishing and interpretive opportunities while limiting shoreline erosion impacts and ensuring visitor safety. At Natural Bridge, the low alluvial shoreline is well-suited for the launching of paddle craft. As you move north the shoreline is characterized by steeper banks more susceptible to erosion. Shoreline access in this portion of the river should be avoided. Approximately one half of the shoreline around Horn Spring is a clearing, created due to past recreational use. The reminder of the spring shoreline is undisturbed.

Natural Scenery
Scenic views are common along the St. Marks River shoreline as the river makes its way towards the Natural Bridge. These views can be enjoyed while hiking or paddling. Excellent views are found on a small bluff located just south of Horn Springs known as "Rock Bluff." Areas on the west side of the river are managed by the Florida Forest Service. Maintaining the scenic viewshed along the river is critical and will require regular cooperation and collaboration with the FFS.

Significant Wildlife Habitat
The St. Marks River and Horn Springs provide critical habitat for a diversity of wildlife including the Florida black bear (*Ursus americanus floridanus*), bald eagles (*Haliaeetus leucocephalus*), little blue herons (*Egretta caerulea*) and wood storks (*Mycteria americana*). The broad riverine forest provides good

habitat for neo-tropical migrants in fall migration. Opportunities for birding and wildlife viewing are excellent.

Natural Features

The most significant natural feature is the Horn Springs complex, comprised of Horn Spring and Little Horn Spring and their associated spring runs. There are eight additional springs on the property as well as numerous swallets and other karst features. These areas are rare and highly sensitive. Access should be carefully monitored and limited to overlooks and boardwalks for interpretive purposes.

Archaeological and Historic Features

The Horn Springs addition protects a significant portion of the original Confederate earthworks, that appears as low hillocks currently dominated by successional forest. Direct access to the earthworks is not recommended due to erosion concerns and protection of the archaeological resource. Portions of this successional forest could be cleared to expose a portion of the earthworks for historical interpretation. The property also protects a number of prehistoric and historic sites that are not accessible for public interpretation.

Assessment of Use

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

Past Uses

Prior to the acquisition by the state in 2017 the property was used for timber production.

Future Land Use and Zoning

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

The entire Horn Springs Addition is located within unincorporated Leon County (Leon County 2014) and is zoned as Rural, which allows for low density development (one unit per ten acres). Other permitted uses in the current zoning designation that are applicable to the DRP include hiking and nature trails, picnicking, paddling trails, bicycle trails, equestrian trails and boat landings. Campgrounds and recreational vehicle parks are allowed on a restricted use basis.

Recreation Opportunity Spectrum (ROS)

The ROS is a series of land-use designations that inform the decision making on the development of the recreational opportunities to be provided in each area. The ROS allows DRP to develop a quality recreational experiences by conserving the park's resources and recreation diversity. The ROS designations can help

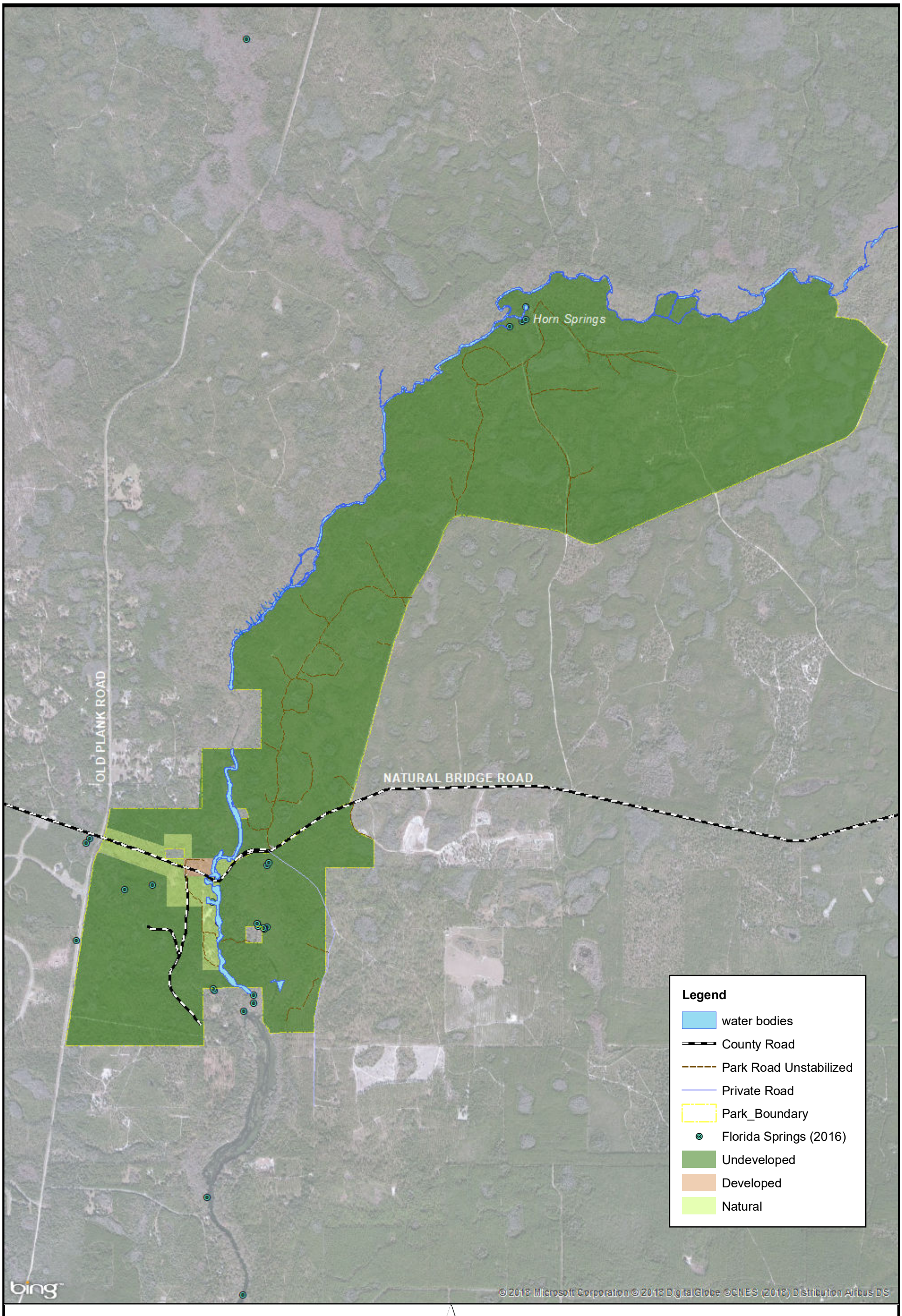
guide management of visitor use patterns, facility design and placement, and recreational carrying capacity.

The following designations are established for the Horn Springs Addition to Natural Bridge Battlefield Historic State Park (see ROS map):

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

Natural
The natural designation is most often associated with a scenic transportation corridor such as a main park drive. It is the area between developed use areas and the more primitive experience associated with the undeveloped designation. The average park user will experience this setting from a vehicle travelling to a use area along a park road. Socialization with others outside one's group is not very important, although the presence of others is expected and tolerated. Most visitor activities are limited to passive day use recreation opportunities including hiking, biking, paddling, and wildlife viewing. Other than paved park roads, most park facilities under the natural designation, including trailheads, kayak launches, etc. are unpaved in order to minimize impacts to natural resources. Occasional support facilities are found in the natural area. The natural area can enhance the overall visitor experience in a park through the facilitation of a distinct entranceway that communicates to visitors that they are entering a state park separate from adjacent land uses.

Undeveloped
A sense of independence, freedom, tranquility, relaxation, appreciation of nature, testing of outdoor skills, and responsibility for resource stewardship is typical. The opportunity to experience a natural ecosystem with little human imprint, a sense of challenge, adventure, risk, self-reliance, and a feeling of solitude are all important characteristics of the undeveloped designation. This is where longer distance hiking trails and primitive camping opportunities are located. It is an area of very limited development with any development utilizing permeable surfaces and prioritizing the minimizing of human impact visually and physically to help create as austere and rustic of a visitor



HORN SPRINGS ADDITION
NATURAL BRDIGE BATTLEFIELD
HISTORIC STATE PARK

N

0 0.25 0.5 1 Miles

Office of Park Planning
Division of Recreation & Parks
Date of aerial: 2018

RECREATION
OPPORTUNITY SPECTRUM

experience as is practical. There is little evidence of management presence with a leave no trace policy promoted. Park visitors in this area are likely to stay overnight in the park due to the time and effort needed to experience this level of solitude in a natural environment. Support facilities are rare to non-existent.

Existing Facilities

The majority of the Horn Springs Addition contains no existing facilities (see Base Map). The park's existing paddling launch is located on the north side of Natural Bridge Road, on the east side of the river within a parcel previously managed by the park under a management agreement with Natural Bridge Timberlands, LLC. This shoreline paddling launch for canoes and kayaks provides paddling access upstream on the St. Marks River.

The main day-use area of the current park is located on the south side of Natural Bridge Road; it contains a parking area picnic shelters and a small restroom. The Civil War Monument donated by the Anna Jackson Chapter of the United Daughters of the Confederacy is located on the north side of Natural Bridge Road. Reconstructed picket lines, and interpretive panels explain the battlefield and its significance.

On the north end of the park, within the original park property, a ranger residence, shop, and equipment storage provide staff presence and facilitate park operations. Three additional structures are located on the Rakestraw Tract. The northernmost building, known as the Rakestraw House, is visible from Natural Bridge Road, and serves as a meeting space for park operations and volunteer events. The two southern buildings, the Blockhouse and the River House, are utilized as staff residences and for park operations.

Recreation Facilities

Canoe/Kayak Launch

Conceptual Land Use Plan

The following narrative represents the current conceptual land use proposal for the Horn Springs Addition. 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.

The conceptual land use plan described here is the long-term optimal development plan for the park, based on current conditions and knowledge of the park's resources, landscape and social setting. The development plan will be

reassessed during the next update of the park management plan, and modified to address new conditions, as needed.

During the development of the management plan, the DRP assessed potential impacts of proposed uses or development on the park resources and applied that analysis to decisions on the future physical plan of the park as well as the scale and character of proposed development. Potential impacts are more thoroughly identified and assessed as part of the site planning process once funding is available for facility development. At that stage, design elements (such as existing topography and vegetation, sewage disposal and stormwater management) and design constraints (such as imperiled species or cultural site locations) are more thoroughly investigated. Municipal sewer connections, 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.

Infrastructure development within the Horn Springs Addition will be limited, due to the extensive floodplain, numerous wetland and karst features, and known cultural resources. Within the park boundary, private vehicles will not be allowed north or south of Natural Bridge Road except for the designated special event area and within existing developed areas. Vehicular access will be available to park staff, and to private vehicles needed for accessibility, safety, interpretive programming or tours and special events.

North of Natural Bridge Road, proposed recreational facilities will support limited passive recreational uses, such as hiking, paddling, nature study and cultural resource interpretation. The majority of the Horn Springs Addition located south of Natural Bridge Road is to be dedicated to resource conservation and protection. Public access in this area will be limited to ranger-led tours and other similar specialized interpretive programming.

Potential Uses

Public Access and Recreational Opportunities

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

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

Legend

- Horn Spring Addition
- Structures
- County Road
- Park Road Unstabilized
- Private Road
- Parking Lots
- Park Boundary

HORN SPRING

OLD BRIDGE

LITTLE HORN SPRINGS

INSET

NATURAL BRIDGE ROAD

RHODES SPRINGS

GERRELL SPRING

ST MARKS RISE ROAD

ST MARKS RIVER RISE SPRING

ST MARKS RIVER

JIM FRENCH ROAD

bing™

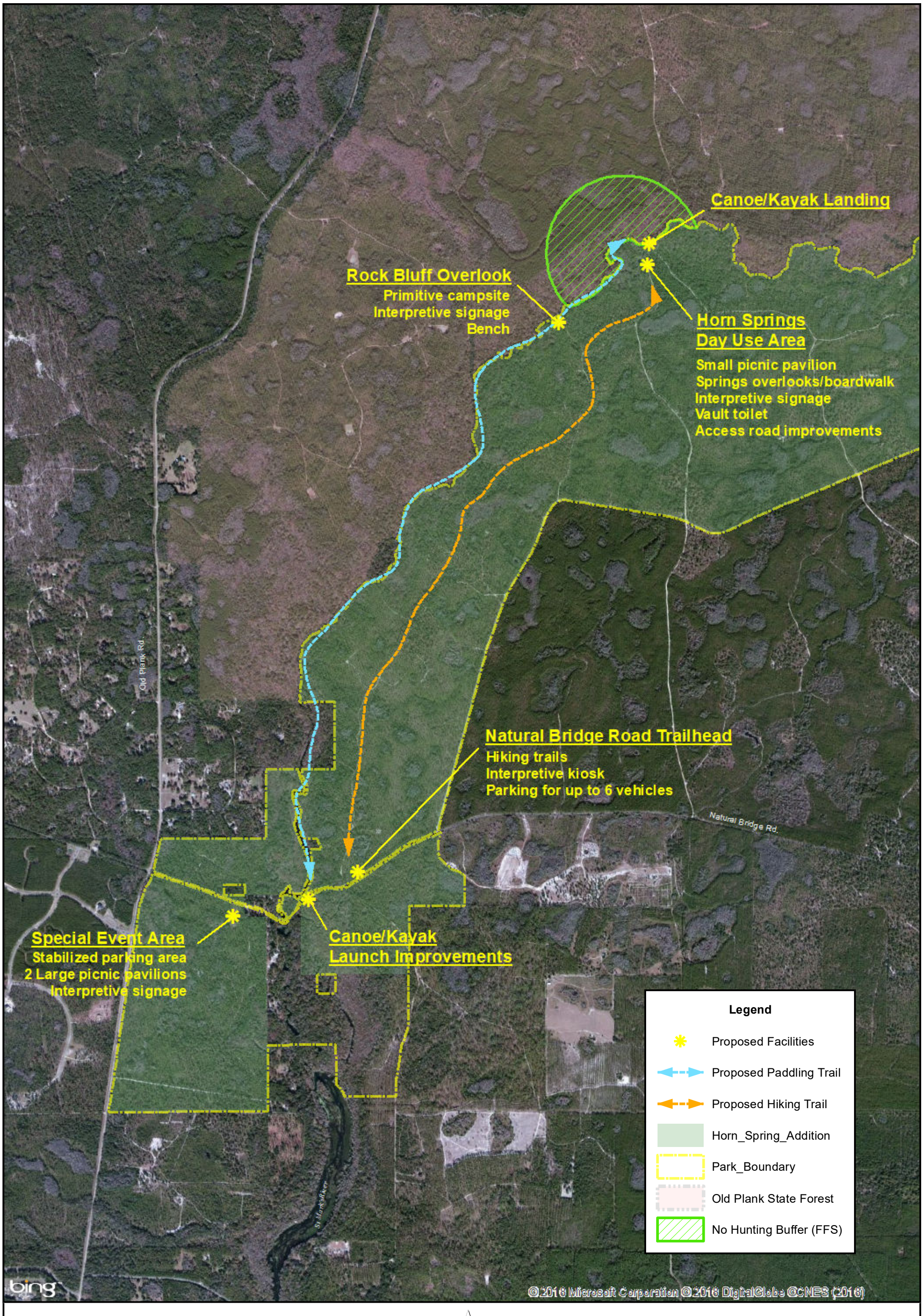
HORN SPRINGS ADDITION

NATURAL BRIDGE BATTLEFIELD
HISTORIC STATE PARK

0 750 1,500 3,000 Feet

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

BASE MAP



HORN SPRINGS ADDITION
NATURAL BRIDGE BATTLEFIELD
HISTORIC STATE PARK

N

0 0.2 0.4 0.8 Miles

Florida Department of Environmental Protection
Division of Recreation and Parks
Date of aerial; 2018

DRAFT
CONCEPTUAL LAND USE PLAN

Objective: Maintain the park's current recreational carrying capacity of 444 users per day.

At Natural Bridge Battlefield Historic State Park, the primary emphasis is placed on protection and maintenance of the unique natural and cultural resources located at the park, while allowing the public an opportunity to experience these features. The park provides visitors with the opportunity to enjoy, reflect, and interpret the geological and historic features of the park through canoeing, kayaking, fishing, nature trails, and picnicking facilities. The current low-impact public use of the site is appropriate and should continue.

Objective: Expand the park's recreational carrying capacity by 284 users per day.

The recent acquisitions at Natural Bridge Battlefield Historic State Park, increased the park's acreage to nearly 2,000 acres and additional recreation opportunities are now available. New and improved recreation opportunities include enhanced paddling access to the Upper St. Marks River, additional trails, picnicking, additional interpretive opportunities, and a dedicated space for use during special events.

Objective: Develop 2 new interpretive, educational and recreational program.

The Horn Springs Addition provides the opportunity for improved interpretation of the park's natural and cultural resources. Improved interpretation for the confederate breastworks can occur at the existing day use area by installing an interpretive kiosk and clearing small diameter vegetation to allow for enhanced viewing of the breastworks.

New interpretive programming and signage can provide important information on the unique character and ecological sensitivity of Horn Springs. Signange and interpretive programming and can be developed along with the proposed expansion to the park's trail network, the development of the Horn Springs Day Use Area and the improved canoe and kayak launch.

Proposed Facilities

Capital Facilities and Infrastructure

Goal: Develop and maintain the capital facilities and infrastructure necessary to implement the recommendations of the management plan.
New construction, as discussed further below, is recommended to improve the quality and safety of the recreational opportunities that visitors enjoy while in the park, to improve the protection of park resources, and to streamline the efficiency of park operations. The following is a summary of improved and new facilities needed to implement the conceptual land use plan for the Horn Springs Addition to Natural Bridge Battlefield Historic State Park:

Objective: Improve/repair 1 existing facility.

Major repair projects for park facilities may be accomplished within the 10-year term of this management plan, if funding is available. These include the modification of existing park facilities to bring them into compliance with the Americans with Disabilities Act (a top priority for all facilities maintained by the DRP). The following discussion of other recommended improvements and repairs are organized by use area within the park.

Improvements to the existing canoe/kayak launch on the north side of Natural Bridge Road is identified in the park's current approved management plan. The existing launch is difficult and unsafe to access. Improving this facility would enhance access to the upper St. Marks River Horn as well as shoreline fishing. Improvements should provide erosion control and universal access. The new facility should include limited stabilized parking for vehicles and boat trailers, interpretive signage and a canoe/kayak drop-off for paddlers.

The existing unimproved access road network within the Horn Springs addition should be stabilized before it is regularly used for park operations. Several spots can be difficult to pass without high tire clearance and four-wheel drive. To facilitate resource management, the existing service road network should be inventoried and assessed. Primary service roads should have low water crossings (LWC) installed. The remaining roads should be removed, converted to trail use or stabilized against erosion as necessary.

Objective: Construct 4 new facilities and 6 miles of trail.

Recreation opportunities within the Horn Springs Addition will promote a passive resourced based recreation experience with emphasis on paddling, hiking, wildlife viewing, and cultural resource interpretation.

<u>Horn Spring Day Use Area</u>

Past uses have left a large clearing adjacent to Horn Spring and also access to the St. Mark's River. This area is well suited for passive day use activities compatible with the long-term preservation of the springs complex. The proposed day use area will be accessed through the future trail system and trailhead located on Natural Bridge Road.

The remaining hunt camp elements will be demolished and new picnic tables, a small picnic shelter, potable water, vault toilet and interpretive signage will be installed. Construction of a viewing platform with interpretive signage is recommended along the shoreline of Horn Spring to protect the spring shoreline from future foot traffic. The construction of a boardwalk from the day use area to Little Horn Spring would also provide an outstanding overlook of Little Horn Spring and the spring run stream.

The DRP will encourage paddling along the St. Marks River and access to Horn Springs. One of the primary recreational benefits of the Horn Springs Addition is the ability to establish a paddling trail between Natural Bridge north to Horn Springs. Visitors will be able to launch at the park's existing canoe/kayak launch and paddle to a proposed canoe/kayak landing to be established along the St. Mark's River near Horn Spring. Paddlers can visit Horn Spring then return, approximately 3 miles each way. DRP will demolish the remnants of a former bridge and create the canoe/kayak landing along river at the former bridge site. The location proposed for the canoe/kayak landing is easily reached from established access routes. However, the launching of private paddle craft from the Horn Springs Day Use Area is not proposed now. As the recreational program at the Horn Springs Addition develops, the need for a paddling launch at the Horn Springs Day Use Area will be considered in the next update to the park's management plan.

River Bluff

This is one of the more scenic vistas along the St. Mark's River corridor. Current conditions support the creation of a primitive campsite and overlook at this location. Installation of interpretive signage and seating would create a rest stop along the trail with exceptional views of the Upper St. Mark's River. These facilities would be accessed via the future trail system. Careful placement of the both the overlook and campsite will be required to provide adequate privacy for primitive campers, and minimize any potential erosion or impacts to cultural resources.

Natural Bridge Road Trailhead/Trail Network

The creation of a trail network north of Natural Bridge Road will allow access to Horn Spring and River Bluff and provide interpretation of the property's natural and cultural resources. The trail system will be accessed via a trailhead to be located on Natural Bridge Road. The trailhead will support a trailhead kiosk and provide pervious stabilized parking for up to 6 vehicles (include 1 ADA space).

Special Event Area

The Horn Springs Addition contains an area that has been historically used as overflow and event parking for the annual reenactment of the Battle at Natural Bridge with the permission of the former property owner. The addition of this property provides the opportunity to stabilize and formalize the parking area and add two large picnic shelters for day use and special events. There is also an opportunity to redesign the park's existing day use area to incorporate this new property and potentially relocate the Rakestraw House to this location to remove it from the boundaries of the actual battlefield site.

Facilities Development

Preliminary cost estimates for these recommended facilities and improvements are provided in the Ten-Year Implementation Schedule and Cost Estimates

(Table 8), located in the Implementation Component of this plan. These cost estimates are based on the most cost-effective construction standards available at this time. Preliminary estimates are provided to assist the DRP in budgeting proposed park improvements, and may be revised as more information is collected through the planning and design processes.

New facilities and improvements to existing facilities recommended by the plan include:

Horn Spring Day Use Area
Small Picnic Pavilion
Springs Overlooks and Boardwalk
Interpretive signage
Potable water
Vault toilet
Access road improvements
Canoe/Kayak Landing

Rock Bluff Overlook
Primitive campsite
Interpretive signage
Seating

Canoe/Kayak Launch Improvements
Shoreline Stabilization and Erosion Control
Improve Canoe/Kayak Launch

Horn Springs Trailhead/Trail System
Hiking trails
Interpretive Kiosk
Parking for up to 6 vehicles

Recreational Carrying Capacity

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

The recreational carrying capacity for this park is a preliminary estimate of the number of users the unit could accommodate after the current conceptual development program has been implemented. When developed, the proposed

new facilities would approximately increase the unit's carrying capacity as shown in Table 7.

Table 7. Recreational Carrying Capacity

	Existing Capacity		Proposed Additional Capacity		Estimated Recreational Capacity	
Activity / Facility	**One Time**	**Daily**	**One Time**	**Daily**	**One Time**	**Daily**
Trails						
Nature Trail	30	120			30	120
General Hiking			24	48	24	48
Picnicking	80	160	84	168	164	328
Primitive Camping			4	4	4	4
Interpretive Program	32	128			32	128
Fishing	8	16	22	44	30	60
Canoeing / Kayaking	10	20	10	20	20	40
TOTAL	**160**	**444**	**144**	**284**	**304**	**728**

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IMPLEMENTATION COMPONENT

The resource management and land use components of this management plan provide a thorough inventory of the park's natural, cultural and recreational resources. They outline the park's management needs and problems, and recommend both short and long-term objectives and actions to meet those needs. The implementation component summarizes the management goals, objectives and actions expressed in the separate parts of this management plan amendment for easy review. Estimated costs for the 10-year period of this plan are provided for each action and objective, and the costs are summarized under standard categories of land management activities.

MANAGEMENT PLAN IMPLEMENTATION

This management plan is written for a timeframe of ten years, as required by Section 253.034 Florida Statutes. The Ten-Year Implementation Schedule and Cost Estimates (Table 8) summarizes the management goals, objectives and actions that are recommended for implementation over this period, and beyond. Measures are identified for assessing progress toward completing each objective and action. A time frame for completing each objective and action is provided. Preliminary cost estimates for each action are provided and the estimated total costs to complete each objective are computed. Finally, all costs are consolidated under the following five standard land management categories: Resource Management, Administration and Support, Capital Improvements, Recreation Visitor Services and Law Enforcement.

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

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

costs identified in Table 8 may need to be adjusted during the 10-year management planning cycle.

Table 8
Natural Bridge Battlefield Historic State Park Ten-Year Implementation Schedule and Cost Estimates

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

Goal I: Provide administrative support for all park functions.		**Measure**	**Planning Period**	**Estimated Manpower and Expense Cost* (10-years)**
Objective A	**Continue day-to-day administrative support at current levels.**	Administrative support ongoing	C	**$6,706**
Objective B	**Expand administrative support as new lands are acquired, new facilities are developed, or as other needs arise.**	Administrative support expanded	UFN	**$119,400**
Goal II: Protect water quality and quantity in the park, restore hydrology to the extent feasible, and maintain the restored condition.		**Measure**	**Planning Period**	**Estimated Manpower and Expense Cost* (10-years)**
Objective A	**Restore natural hydrological conditions and functions to approximately 0.2 acres of spring-run stream natural community.**	# Acres restored	UFN	**$80,000**
Action 1	Complete hydrological assessment of Horn Spring feature.	Assesment completed	ST	$20,000
Action 2	Execute recommended actions (e.g. dredge out sediment accumulation, recontour surrounding substrate).	Date implemented	ST	$50,000
Action 3	Replant margins of spring feature with native vegetation.	# Acres restored	LT	$10,000
Goal III: Restore and maintain the natural communities/habitats of the park.		**Measure**	**Planning Period**	**Estimated Manpower and Expense Cost* (10-years)**
Objective A	**Complete a comprehensive floral and faunal survey and create/update the park's baseline plant and animal list for the Horn Spring Addition.**	List developed updated	ST	**$21,000**
Action 1	Complete a comprehensive survey.	Survey complete	ST	$16,000
Action 2	Create/update a baseline plant and animal list.	List developed updated	C	$5,000
Objective B	**Within 10 years, have 100 acres of the Horn Spring Addition maintained within the optimum fire return interval.**	# Acres	UFN	**$95,600**
Action 1	Develop/update annual burn plan	Plan developed/updated	ST	$16,000
Action 2	Manage fire dependent communities by burning between 287 –573 acres annually	# Acres	UFN	$79,600
Goal IV: Maintain, improve or restore imperiled species populations and habitats in the park.		**Measure**	**Planning Period**	**Estimated Manpower and Expense Cost* (10-years)**
Objective A	**Develop/Update baseline imperiled species occurrence inventory lists for plants and animals within the Horn Spring Addition.**	List developed updated	ST	**$10,000**
Action 1	Develop full inventory of imperiled species on the Horn Spring Addition.	List developed updated	ST	**$4,000**
Action 2	Verify gopher tortoise population presence and begin monitoring efforts for active burrws within the Horn Spring Addition.	Survey complete	ST	**$6,000**

* 2018 Dollars
ST = actions within 2 years
LT = actions within 10 years
C = long term or short term actions that are continuous or cyclical
UFN = currently unfunded need

Table 8
Natural Bridge Battlefield Historic State Park Ten-Year Implementation Schedule and Cost Estimates
Sheet 2 of 3

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

Goal V: Remove exotic and invasive plants and animals from the park and conduct needed maintaince-control.		**Measure**	**Planning Period**	**Estimated Manpower and Expense Cost* (10-years)**
Objective A	**Annually treat 1 acre of exotic plant species in the Horn Spring Addition.**	# Acres treated	C	**$27,500**
Action 1	Update exotic plant management annual work plan.	Plan Updated	C	$16,000
Action 2	Implement annual work plan by treating 1 acre in Horn Spring Addition, annually, and continuing maintenance and follow-up treatments, as needed.	# Acres treated	C	$10,000
Objective B	**Implement control measures on 2 exotic and nuisance animal species in the Horn Sping Addition, feral hogs and armadillos.**	# Species for which control measures implemented	C	**$1,500**
Goal VI: Protect, preserve and maintain the cultural resources of the park.		**Measure**	**Planning Period**	**Estimated Manpower and Expense Cost* (10-years)**
Objective A	**Assess and evaluate the physical condition of 8 cultural resources in the Horn Spring Addition.**	Documentation complete	LT	**$239**
Action 1	Complete DRP condition assessment of archaeological sites.	Assesment completed		
Objective B	**Compile reliable documentation for all recorded historic and archaeological resources within the Horn Spring Addition.**	Documentation complete	C	**$7,382**
Action 1	Ensure all known archaeological sites, historic structures and cultural landscapes are recorded or updated in the Florida Master Site File.	Documentation complete	ST	$2,229
Action 2	Complete archaeological sensitivity model for the Horn Spring parcel acreage.	Research conducted	LT	$3,762
Action 3	Arrange for follow up archaeological surveys of park property based on knowledge gained from previous projects.	Research conducted	LT	$1,072

* 2018 Dollars
ST = actions within 2 years
LT = actions within 10 years
C = long term or short term actions that are continuous or cyclical
UFN = currently unfunded need

Table 8
Natural Bridge Battlefield Historic State Park Ten-Year Implementation Schedule and Cost Estimates

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

Goal VII: Provide public access and recreational opportunities in the park.		**Measure**	**Planning Period**	**Estimated Manpower and Expense Cost* (10-years)**
Objective B	**Expand the park's recreational carrying capacity by 284 users per day.**	# Recreation/visitor opportunities per day	UFN	**$24,335**
Objective C	**Continue to provide the current repertoire of 5 interpretive, educational and recreational programs on a regular basis.**	# Interpretive/Education programs	C	**$15,000**
Objective D	**Develop 2 new interpretive, educational and recreational programs for the Horn Spring Addition**	# Interpretive/Education programs implemented	UFN	**$137,300**
Action 1	Update and implement Statement for Interpretation	Statement Updated/Implemented	ST	$7,300
Action 2	Develop 2 new interpretive programs.		UFN	$130,000
Goal VIII: Develop and maintain the capital facilities and infrastructure necessary to meet the goals and objectives of this management plan.		**Measure**	**Planning Period**	**Estimated Manpower and Expense Cost* (10-years)**
Objective A	**Maintain all public and support facilities in the park.**	Facilities maintained	C	**$26,823**
Objective B	**Improve and/or repair 1 existing facilites as identified in the Land Use Component.**	# Facilities/Miles of Road	UFN	**$80,000**
Objective C	**Construct 5 new facilites and 3 miles of trail as identified in the Land Use Component.**	# Facilities/Miles of Trail/Miles of Road	UFN	**$212,000**
Objective D	**Expand maintenance activities as existing facilities are improved and new facilities are developed.**	Facilities maintained	UFN	**$477,600**

Summary of Estimated Costs		
Management Categories		**Total Estimated Manpower and Expense Cost* (10-years)**
Resource Management		**$241,721**
Administration and Support		**$126,106**
Capital Improvements		**$292,000**
Recreation Visitor Services		**$654,235**
Law Enforcement Activities[1]		**$0**
	[1]Law enforcement activities in Florida State Parks are conducted by the DEP Division of Law Enforcement and by local law enforcement agencies.	

* 2018 Dollars
ST = actions within 2 years
LT = actions within 10 years
C = long term or short term actions that are continuous or cyclical
UFN = currently unfunded need

Appendix 1—Acquisition History

LAND ACQUISITION HISTORY REPORT

Park Name	Natural Bridge Battlefield Historic State Park
Date Updated	10/28/2015
County	Leon
Trustees Lease Number	3635 (originally Lease No. 2324)
Current Park Size	135.20 acres
Purpose of Acquisition	The State of Florida initially acquired Natural Bridge Battlefield State Park to establish and maintain suitable park and erect a monument and memorial at the scene of the Battle of Natural Bridge.

Acquisition History

Parcel Name or Parcel DM-ID	Date Acquired	Initial Seller	Initial Purchaser	Size in acres	Instrument Type
MDID359819	2/25/2009	James F. & Elania T. Rakestraw, John B. & Reta A. Rakestraw, and Irma Patricia Richardson (also known as I Patricia Hodnett)	The Board of Trustees of the Internal Improvement Trust Fund of the State of Florida (Trustees)	55.913	Warranty Deed
MDID368192	9/16/2011	Gerrell Plantation, Inc.	Trustees	55.736	Warranty Deed

Management Lease

Parcel Name or Lease Number	Date Leased	Initial Lessor	Initial Lessee	Current Term	Expiration Date
Lease No. 3635 (originally Lease No. 2324)	(original lease) 01/23/1968	The Trustees of the Internal Improvement Fund of the State of Florida	The Florida Board of Parks and Historic Memorials	99 years	1/22/2067

Outstanding Issue	Type of Instrument	Brief Description of the Outstanding Issue	Term of the Outstanding Issue
There is no known deed restriction or encumbrance that applies to Natural Bridge Battlefield Hitoric State Park.			

Appendix 2—Advisory Group Members and Report

Appendix 3—References Cited

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Appendix 4—Soil Descriptions

3 – Lutterloh sand, 0 to 5 percent slopes. This nearly level to gently sloping, somewhat poorly drained soil is on low uplands and in high areas on flatwoods. The mapped areas are irregular in shape and range from 5 to 80 acres in size. Typically, the surface layer is gray fine sand about 7 inches thick. The subsurface layer, to a depth of about 58 inches, is light gray fine sand. It is mottled with shades of yellow in the lower part. The subsoil is fine sandy loam mottled with shades of yellow and brown. The upper part to a depth of about 70 inches is light brownish gray. The lower part to a depth of more than 80 inches is light gray. Other soils occurring in areas of this map unit include Ocilla soils, which are similar to the Lutterloh soil but have a loamy subsoil between depths of 20 and 40 inches. Also occurring are some similar soils that are underlain by limestone bedrock. Included in this map unit are small areas of dissimilar soils. These are Plummer, Ridgewood, Otela, and Ortega soils. Plummer soils are lower on the landscape than the Lutterloh soil and are poorly drained. Ridgewood soils are sandy throughout. Otela and Ortega soils are in the higher positions and are better drained than the Lutterloh soil. Also, Ortega soils are sandy throughout. Dissimilar soils make up about 15 percent of the map unit. This Lutterloh soil has a seasonal high water table at a depth of 18 to 30 inches for 2 to 4 months of the year and at a depth of 30 to 72 inches for most of the remainder of the year. The available water capacity is very low in the surface layer and subsurface layer and is moderate in the subsoil. Permeability is rapid in the surface layer and subsurface layer and is moderate in the subsoil. The organic matter content is moderately low and natural fertility is low. The natural vegetation includes longleaf pine, slash pine, and mixed hardwoods, such as white oak, live oak, laurel oak, sweet gum, hickory, dogwood, and persimmon. The understory consists of native grasses and shrubs, such as huckleberry, briers, and pineland threeawn. This soil has severe limitations affecting cultivated crops because of periodic wetness and droughtiness in the root zone. The variety of suitable crops that can be grown is very limited unless intensive water control measures are used. With adequate water control, corn, soybeans, and peanuts are moderately well suited to this soil. Close growing, soil improving cover crops should be included in the rotation with row crops at least two thirds of the time. Applications of lime and fertilizer are needed for the best yields. This soil has moderate limitations affecting hay and pasture. Proper management is needed to obtain maximum yields. Coastal bermudagrass, bahiagrass, and clover are well suited to this soil. These plants respond well to applicants of fertilizer and lime. A simple drainage system is needed to remove excess subsurface water during wet periods. Controlled grazing helps to maintain plant vigor and obtain optimum yields. The potential of this soil for the production of slash pine, loblolly pine, and longleaf pine is high. A moderate equipment limitation, seedling mortality, and plant competition are the main management concerns. Slash pine and loblolly pine are the preferred trees to plant. This soil has severe limitations affecting septic tank absorption fields, trench and area sanitary landfills, shallow excavations, dwellings with basements, small commercial buildings, lawns and landscaping, and gold fairways. It has moderate limitations affecting dwellings without basements and local roads and streets. The wetness is main limitation. This soil has severe limitations affecting the development of camp areas, picnic

areas, playgrounds, and paths and trails. The main limitations are the wetness and the sandy texture of the surface layer.

7 – Otela fine sand, 0 to 5 percent slopes. This nearly level to gently sloping, moderately well drained soil is on low knolls and broad uplands. The mapped areas are elongated or irregular in shape and range from 5 to 200 acres in size. Typically, the surface layer is grayish brown fine sand about 7 inches thick. The upper part of the subsurface layer, to a depth of about 23 inches, is light gray fine sand. The next part, to a depth of about 67 inches, is a transitional layer of loamy fine sand mottled with shades of red, brown, yellow, and white. The subsoil, to a depth of about 80 inches, is light gray fine sandy loam mottled with strong brown and brownish yellow. Other soils occurring in areas of this map unit include Shadeville soils, which are similar to the Otela soil but have a loamy subsoil between depths of 20 to 40 inches and are underlain by limestone at a depth of 30 to 60 inches. Included in this map unit are small areas of dissimilar soils. These are Alpin, Lutterloh, and Ortega soils. Alpin soils are sandy and have lamellae. They are better drained than the Otela soil and are somewhat poorly drained. Lutterloh soils are lower on the landscape than Otela soil and are somewhat poorly drained. Ortega soils are sandy. Dissimilar soils make up about 15 percent of the map unit. This Otela soil has a perched water table above the subsoil during wet periods. Generally, the water table is at a depth of more than 72 inches. The available water capacity is very low in the surface layer and subsurface layer and is moderate in the subsoil. Permeability is rapid in the surface layer and subsurface layer and is moderate in the subsoil. The organic matter content and natural fertility is low. The natural vegetation includes mainly slash pine, loblolly pine, longleaf pine, bluejack oak, red oak, and live oak. The understory consists of dwarf huckleberry and pineland threeawn. This soil has severe limitations affecting most cultivated crops. Droughtiness and rapid leaching of plant nutrients limit the choice of plants that can be grown and reduce the potential yield of adapted crops. In the more sloping areas, row crops should be planted on the contour in alternating strips with close growing cover crops. Planting soil improving cover crops and leaving crop residue on the surface helps to maintain fertility and control erosion. Irrigation generally is feasible if water is readily available. This soil has moderate limitations affecting hay and pasture. Deep rooted plants, such as coastal bermudagrass and improved bahiagrass, are well suited to this soil, but yields are reduced by the periodic droughtiness. Regular applications of lime and fertilizer are needed for the best yields. Controlled grazing helps to maintain plant vigor and a good ground cover. The potential of this soil for the production of pine trees is moderately high. The equipment limitation, seedling mortality, and plant competition are the main management concerns. Slash pine is the preferred tree to plant. This soil has moderate limitations affecting septic tank absorption fields, trench sanitary landfills, dwellings with basements, lawns and landscaping, and golf fairways. It has severe limitations affecting area sanitary landfills and shallow excavations. The wetness and the sandy texture of the surface layer are main limitations. This soil has severe limitations affecting the development of camp areas, picnic areas, playgrounds, and paths and trails. The sandy texture of the surface layer is the main limitation.

8 – Chipley fine sand, 0 to 2 percent slopes. This somewhat poorly drained, nearly level soil is on moderately low uplands. Slopes are smooth. Typically, the surface layer is fine sand about 15 inches thick. The upper 5 inches is very dark gray and the lower 10 inches is dark grayish brown. The underlying layer is fine sand to a depth of 80 inches or more – the upper 8 inches is brown that has gray mottles; the next 14 inches is brownish yellow that has reddish yellow and gray mottles; and the lower 43 inches is brownish yellow, light brownish gray, and white. Included with this soil in mapping are small areas of Rutledge, Ortega, and Albany soils. Ortega soils are on slightly higher positions and Rutledge soils in low positions. These inclusions make up less than 20 percent of the map unit. This Chipley soil has a water table within a depth of 20 to 40 inches for 2 to 4 months in most years. The available water capacity is low in the surface layer and very low in the other layers. Permeability is rapid. Natural fertility is low. Native trees and understory consist mostly of slash and longleaf pine, scattered post, turkey oak, blackjack oak, and pineland threeawn. This soil has severe limitations for cultivated crops. Droughtiness and rapid leaching of plant nutrients limit the choice of crops and reduce potential yields of suitable crops. The presence of a water table within 20 to 40 inches of the surface in wet seasons affects the availability of water in the root zone by providing water through capillary rise to supplement the low available water capacity. In very dry seasons the water table drops well below the root zone and little capillary water is available to plants. The crop rotation should include close growing crops to cover the soil at least two thirds of the time. Lime and fertilizer should be applied as needed. Soil improving cover crops and all crop residue should be used to protect the soil from erosion. Irrigating high value crops is usually feasible where water is readily available. Tile and other drainage methods are needed for some crops that could be damaged by a high water table during the growing season. The soil is moderately well suited for pastures and hay. Suitable plants include coastal bermudagrass and bahiagrasses. The soils often require fertilizer and lime. Controlled grazing maintains vigorous plants. The potential for trees on this soil is high. Equipment use limitations, seedling mortality, and plant competition are management concerns. Slash and loblolly pine are the best suited trees to plant for commercial woodland production.

23 – Leon sand, 0 to 2 slopes. This poorly drained, nearly level soil is in the flatwoods. Slopes are less than two percent and smooth to concave. Typically, the surface layer is dark gray sand about six inches thick. The subsurface layer is sand about 19 inches thick. The upper 7 inches is light brownish gray sand, and the lower 12 inches is light gray sand. The upper part of the subsoil, to a depth of 29 inches, is black loamy sand and very slightly cemented; to about 41 inches, it is dark reddish brown sand. Below the subsoil is dark yellowish brown sand that extends 80 inches or more. Included with this soil in mapping are small areas of Talquin, Rutledge, and Sapelo soils. These inclusions make up less than 20 percent of the map unit. This Leon soil has a water table at depths of 10 to 40 inches for more than 9 months during most years, and at depths less than 10 inches for 1 to 4 months in most years during periods of high rainfall. Available water capacity

is very low in the surface and subsurface layers and low in the subsoil. Permeability is rapid in the surface and subsurface layers, moderate to moderately rapid in the subsoil, and very rapid in the substratutum. Natural fertility is low. Native trees include longleaf pine, slash pine, water oak, and myrtle; a thick understory includes saw palmetto, running oak, fetterbush, gallberry, and pineland three awn. This soil has very severe limitations for cultivated crops. Because of wetness and sandy texture, a water control system that removes excess water after heavy rainfall and supplies subsurface irrigations during dry seasons is needed for high yields for a few suited crops. This soil is well suited to pasture and hay crops; however, a good water control system is needed to remove excess water. Pasture and forage plants respond well to fertilizer and lime. Controlled grazing helps to maintain vigorous plant growth. This soil has moderate potential for pine trees. Slash pines are the best suited trees to plant for commercial woodland production. Equipment use limitations, seedling mortality, and plant competition are the main limitations. Planting the trees on beds lower the effective depth of the water table.

26 – Tooles-Nutall fine sands. These soils are nearly level and are poorly drained. They are in broad areas on flatwoods. The mapped areas are irregular in shape and range from 10 to 800 acres in size. Slopes are 0 to 1 percent. In 80 percent of the areas mapped as Tooles-Nutall fine sands, these soils and similar soils make up 75 to 91 percent of the map unit. Generally, the mapped areas are about 60 percent Tooles and similar soils and 24 percent Nutall and similar soils. Dissimilar soils make up about 16 percent. The soils in this map unit occur as areas so intermingled that mapping them separately at this scale used is not practical. The pattern of Tooles, Nutall, and similar soils is relatively consistent in most delineations of the map unit. Areas of each soil within the delineations range from about 0.25 acre to 4 acres in size. Typically, the Tooles soil has a black fine sand surface layer about 6 inches thick. The upper part of the subsurface layer to a depth of about 14 inches is pale brown fine sand. The lower part to a depth of about 26 inches is light gray fine sand. The subsoil to a depth of about 50 inches is light brownish gray fine sandy loam. Limestone bedrock is at a depth of about 50 inches. The Tooles soil has a seasonal high water table within 10 inches of the surface for 6 to 8 months of the year. The available water capacity is low in the surface layer and subsurface layer and is moderate in the subsoil. Permeability is rapid in the surface layer and slow in the subsoil. The organic matter content and natural fertility are low. Typically, the Nutall soil has a very dark gray fine sand surface layer about 5 inches thick. The subsurface layer to a depth of about 10 inches is gray fine sand. The upper part of the subsoil to a depth of about 20 inches is mixed brownish yellow and gray sandy clay loam. The lower part to a depth of about 37 inches is gray sandy clay loam mottled with yellowish brown. Limestone bedrock is at a depth of about 37 inches. The Nutall soil has a seasonal high water table within 10 inches of the surface for 6 to 8 months of the year. The available water capacity is low in the surface layer and subsurface layer and is moderate in the subsoil. Permeability is rapid in the surface layer and subsurface layer and is slow in the subsoil. The organic matter content and natural fertility are low. Other

soils occurring in areas of this map unit include some soils that are similar to the major soils but have a surface layer that is too think and too light in color to be within the defined range of the Tooles or Nutall series. Included in this map unit are small areas of dissimilar soils. These are Chaires, Leon, Plummer, and Surrency soils. Chaires and Leon soils have a sandy dark organic stained subsoil. Plummer soils are not underlain by limestone. Surrency soils are lower on the landscape than the major soils and are poorly drained. Also included are areas of soils that do not have a loamy subsoil and are underlain by limestone. The natural vegetation includes slash pine, laurel oak, sweetgum, cabbage palm, red maple, sweetbay, and wax myrtle. The soils in the map unit generally are not used for cultivated crops or for hay crops or pasture. Severe limitations affect these users. The wetness is the main limitation. The potential of these soils for the production of pine trees is moderately high. The equipment limitation and seedling mortality are the main management concerns. Slash pine is the preferred tree to plant. These soils have severe limitations affecting septic tank absorptive fields, trench and area sanitary landfills, shallow excavations, dwellings with or without basements, small commercial buildings, local roads and streets, lawn and landscaping, and golf fairways. The wetness of the soil is a major limitation. These soils have severe limitations affecting the development of camp areas, picnic areas, playgrounds, and paths and trails. The wetness is the main limitation. These soils have severe limitations affecting the development of camp areas, picnic areas, playgrounds, and paths and trails. The wetness is a major limitation.

28 – Tooles-Nutall fine sands, frequently flooded. These soils are nearly level and are very poorly drained. They are along the major drainageways on flatwoods. The mapped areas are irregular in shape and range from 20 to several thousand acres in size. Slopes are 0 to 1 percent. In 80 percent of the areas mapped as Tooles-Nutall fine sands, frequently flooded, these soils make up 80 to 90 percent of the map unit. Generally, the mapped areas are about 49 percent Tooles soil and 43 percent Nutall soil. Dissimilar soils make up 8 percent. The soils in this map unit occur as areas so intermingled that mapping them separately at the scale used is not practical. The pattern of Tooles and Nutall soils is relatively consistent in most delineations of the map unit. Areas of each soil within the delineations range from about 0.25 acre to 4 acres in size. Typically, the Tooles soil has a black fine sand surface layer about 3 inches thick. The next layer to a depth of about 8 inches is very dark gray fine sand. The subsurface layer to a depth of about 39 inches is sand. It is light brownish gray in the upper part and light gray in the lower part. The subsoil to a depth of about 59 inches is mottled light brownish gray and very pale brown sandy clay loam. Limestone bedrock is at a depth of about 59 inches. The Tooles soil is flooded for 6 to 8 months during the year and has a seasonal high water table within a depth of 12 inches for most of the remainder of the year. The available water capacity is low in the surface layer and slow in the subsoil. Permeability is rapid in the surface layer and slow in the subsoil. The organic matter content and natural fertility are low. Typically, the Nutall soil has a black fine sand surface layer about 7 inches thick. The next layer to a depth of 11 inches, is very dark brown sand. The

subsurface layer to a depth of about 17 inches, is gray sand. The subsoil to a depth of about 26 inches is light gray sandy clay loam. Limestone bedrock is at a depth of about 26 inches. The Nutall soil is flooded for 6 to 8 months during the year and has a seasonal high water table within a depth of 12 inches for most of the remainder of the year. The available water capacity is moderate in the surface layer and in the subsoil. Permeability is rapid in the surface layer and slow in the subsoil. The organic matter content and natural fertility is low. Included in this map unit are small areas of dissimilar soils. These are Chaires soils and Tooles and Nutall soils that are not subject to flooding. All of these included soils are higher on the landscape than the major soils and are poorly drained. In addition, Chaires soils have a sandy dark organic stained subsoil. Also included are areas of soils that are not underlain by limestone bedrock and some soils in depressional areas that have a sandy dark organic stained subsoil. The natural vegetation includes red maple, sweetgum, sweetbay, cabbage palm, tupelo, bald cypress, and water oak. The soils in this map unit are not suited to cultivated crops or hay crops or pasture. The wetness is the main limitation. The flooding is a hazard. The potential of the soils for woodland is moderately high. Hardwoods, bald cypress, and sweetgum grow well on these soils but pine trees do not. These soils have severe limitations affecting septic tank absorption fields, trench, and area sanitary landfills, shallow excavations, dwellings with and without basements, small commercial buildings, local roads and streets, lawns and landscaping, and golf fairways. The wetness and the flooding are the main limitations. These soils have severe limitations affecting the development of camp areas, picnic areas, playgrounds, and paths and trails. The wetness and flooding are the main limitations.

37 – Ortega sand, 0 to 5 percent slopes. This nearly level to gently sloping, moderately well drained soil is on small to medium areas on upland ridges. Typically, the surface layer is sand about 10 inches thick. The upper 4 inches is gray and the lower 6 inches is light brownish gray. The underlying layers are sand to a depth of about 44 inches and fine sand to 80 inches or more. From 10 to 18 inches is very pale brown, the next 16 inches is yellow, the next 28 inches is yellow that has brownish mottles, and the lower 8 inches is white that has yellowish mottles. Included with this soil in mapping are small areas of Blanton and Kershaw soils. These inclusions make up about 25 percent of the map unit. This Ortega soil has a water table that fluctuates between depths of about 60 to 72 inches in many years during rainy seasons and within depths of 40 to 60 inches occasionally during heavy rainfall periods. Available water capacity is low in the surface layer and very low in the underlying layers. Permeability is rapid, natural fertility is low. Native trees are dominantly longleaf pines that have a ground cover of pineland threeawn. This soil has severe limitations for most cultivated crops. Droughtiness and rapid leaching of plant nutrients limit the choice of plants and reduce potential yields of suitable crops. To reduce the erosion hazard, row crops should be planted on the contour. The crop rotation should include close-growing crops on the soil at least two thirds of the time. Crops respond well to fertilizer and lime. Soil improving cover crops and crop residue should be used to protect the soil from erosion. Irrigation of high value crops is usually feasible where

water is readily available. These soils are moderately well suited to pasture and hay. Plants such as coastal bermudagrass and bahiagrass are well suited. Fertilizer and lime are needed. Controlled grazing is needed to maintain vigorous plants. This soil has a moderately high potential for pine trees. Slash and longleaf pine are the best suited trees to plant for commercial woodland production.

38 – Scranton sand. This nearly level, poorly drained soil is in broad areas on flatwoods. The mapped areas are irregular in shape and range from 10 to 300 acres in size. Slopes are 0 to 2 percent. Typically, the surface layer very dark grayish brown sand about 7 inches thick. The upper part of the underlying material, to a depth of about 18 inches, is grayish brown sand. The lower part, to a depth of 80 inches or more, is light gray sand. Other soils occurring in areas of this map unit include Pottsburg soils, which are similar to the Scranton soil but have a sandy, dark, organic-stained subsoil at a depth of more than 50 inches. Included in this map unit are small areas of dissimilar soils. These are Chaires, Leon, Plummer, Ridgewood, and Rutledge soils. Chaires and Leon soils have a sandy, dark, organic-stained subsoil within 30 inches of the surface. Plummer and Rutledge soils are in different soils on the landscape than the Scranton soil. Dissimilar soils make up about 15 percent of the map unit. This Scranton soil has a seasonal high water table within 10 inches of the surface for 1 to 3 months of the year and at a depth of 10 to 40 inches for more than 6 months in most years. The available water capacity is very low in the surface layer and underlying material. Permeability is rapid in the surface layer and underlying material. The organic matter content is moderately low, and natural fertility is low. The natural vegetation includes longleaf pine, slash pine, and water oak. The understory consists of wax myrtle, saw palmetto, running oak, fetterbush, gallberry, and pineland three awn. This soil has severe limitations affecting cultivated crops. The wetness is the main limitation. This soil has severe limitations affecting hay and pasture. This seasonal high water table and rapid leaching of plant nutrients limit the choice of plants that can be grown and reduce the potential yields of adapted crops. Intensive management of soil fertility and water is required. The potential of this soil for the production of pine trees is moderate. Slash pine is the preferred tree to plant. The equipment limitation, seedling mortality, and plant competition are the main limitations. Windthrow is a hazard. Planting the trees on beds lowers the effective depth of the water table. This soil has severe limitations affecting septic tank absorption fields, trench and area sanitary landfills, shallow excavations, dwellings with or without basements, small commercial buildings, local roads and streets, lawns and landscaping, and golf fairways. The wetness is the main limitation. This soil has severe limitations the development of camp areas, picnic areas, playgrounds, and paths and trails. The wetness and the sandy texture of the surface layer are the main limitations. The land capacity classification is IVw.

44 – Tooles-Nutall fine sands, depressional. These soils are nearly level and are very poorly drained. They are in depressions on flatwoods. The mapped areas are irregular in shape and range from 4 to several hundred acres in size. Slopes are concave and are less than 1 percent. In 90 percent

of the areas mapped as Tooles-Nuttall fine sands, depressional, these soils and similar soils make up 76 to 99 percent of the map unit. Generally, the mapped areas are about 52 percent Tooles and similar soils and about 38 percent Nuttall and similar soils. Dissimilar soils make up about 10 percent. The soils in this map unit occur as areas so intermingled that mapping them separately at the scale used is not practical. The pattern of Tooles, Nuttall, and similar soils is relatively consistent in most delineations of the map unit. Areas of each soil within the delineations range from 0.25 to 4.0 acres in size. Typically, the Tooles soil has a black fine sand surface layer about 7 inches thick. The next layer, to a depth of about 15 inches, is dark grayish brown fine sand. The subsurface layer, to a depth of about 38 inches, is light gray sand that has common mottles of yellow. The subsoil is sandy clay loam to a depth of about 56 inches. The upper part is dark grayish brown and has common mottles of reddish brown. Limestone bedrock is at a depth of about 56 inches. In most years the Tooles 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 available water capacity is low in the surface layer and subsurface layer is high in the subsoil. Permeability is rapid in the surface layer and subsurface layer and is slow in the subsoil. The organic matter content and natural fertility are low. Typically, the Nuttall soil has a black fine sand surface layer about 8 inches thick. The next layer, to a depth of about 12 inches, is very dark gray fine sand. The subsurface layer, to a depth of about 18 inches, is light brownish gray sand that has many mottles of reddish yellow. The subsoil, to a depth of about 33 inches, is light gray sandy clay loam that has common mottles of strong brown. Limestone bedrock is at a depth of about 33 inches. In most years, the Nuttall soil is ponded for 4 to 6 months and has a seasonal high water table within a depth of 20 inches for the remainder of the year. The available water capacity is low in the surface layer and subsurface layer and is moderate in the subsoil. Permeability is rapid in the surface layer and subsurface layer and is slow in the subsoil. The organic matter content and natural fertility are low. Other soils occurring in areas of this map unit include other Tooles and Nutall soils, which are similar to the major soils but are in slightly higher positions on the landscape. Included in this map unit are small areas of dissimilar soils. These are Chaires, Rutledge, and Surrency soils. Chaires soils have a sandy, dark, organic-stained subsoil. Rutledge and Surrency soils are not underlain by limestone. In addition, Rutledge soils are sandy. The natural vegetation includes red maple, sweet gum, cabbage palm, tupelo, bald cypress, water oak. These soils are not suited to cultivated crops. The wetness and the ponding are the main limitations. The potential of the soils in this map unit for woodland is moderately high. Bald cypress and gum trees grow well and are the preferred species to plant. Pine trees do not grow well. These soils have severe limitations affecting septic tank absorption fields, trench and area sanitary landfills, shallow excavations, dwellings with or without basements, small commercial buildings, local roads and streets, lawns and landscaping, and gold fairways. The ponding and the wetness are the main limitations. These soils have severe limitations affecting the development of camp areas, playgrounds, and paths and trails. The wetness and the pondness are the main limitations. The land capability classification is VIIw.

47 – Talquin fine sand. This poorly drained, nearly level soil is on broad flatwoods. Slopes are 0 to 2 percent and smooth to concave. Typically, the surface layer is dark gray fine sand 7 inches thick. The subsurface layer is light gray fine sand about 15 inches thick. The subsoil is fine sand about 12 inches thick – the upper 2 inches is very dark gray and the lower 10 inches is brown. Below the subsoil is light yellowish brown fine sand that extends to 80 inches or more. Included with this soil in mapping are small areas of Chaires, Leon, Plummer, Rutledge, and Sapelo soils. Total inclusions make up about 15 percent of the map unit. This Talquin soil has a water table 10 inches below the surface for 1 to 3 months in most years and is at depths of 20 to 40 inches 9 or more months in most years. Available water capacity is very low in the surface, subsurface, and substratum layers and low in the subsoil. Permeability is rapid in the surface, subsurface, and substratum layers and moderate to moderately rapid in the subsoil. Natural fertility is low. Native plants include longleaf and slash pine, scattered water oaks and wax myrtle, and a thick undergrowth of saw palmetto, running oak, fetterbush, gallberry, and pineland threeawn. This soil has very severe limitations for cultivated crops. Because of wetness and sandy texture, a water control system that removes excess water after heavy rainfall and supplies subsurface irrigation during dry seasons is needed for high yields. With good water control this soil is fairly well suited to most local crops. These crops respond well to lime and fertilizer. Returning crop residue and cover crops to the soil helps to protect the soils from erosion. This soil is well suited to pasture and hay crops; however, a good water control system is needed to remove excess water. Fertilizer and lime are needed. Controlled grazing helps maintain vigorous plant growth. This soil has moderately high potential for pine trees. Equipment limitations, seedling mortality, and plant competition are management concerns. Planting the trees on beds lowers the effective depth of the water table. Slash and longleaf pine are the best suited trees to plant for commercial woodland production.

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Appendix 5—Plant and Animal List

Natural Bridge Battlefield Historic State Park
Plants

Common Name	*Scientific Name*	Primary Habitat Codes (for designated species)
	PLANTS	
Red Maple	*Acer rubrum*	
Mimosa *	*Albizia julibrissin*	
Common ragweed	*Ambrosia artemisiifolia*	
Broomsedge	*Andropogon virginicus*	
Wiregrass	*Aristida stricta*	
Three awn grass	*Aristida sp.*	
Cane	*Arundinaria gigantea*	
Slim leaf paw paw	*Asimina angustifolia*	
Small flowered paw paw	*Asimina parviflora*	
Salt bush	*Baccharis halimifolia*	
Rattan vine	*Berchemia scandans*	
Crossvine	*Bignonia capreolata*	
Heart of Jesus *	*Caladium bicolor*	
Beauty berry	*Callicarpa americana*	
Trumpet vine	*Campsis radicans*	
Sedge	*Carex sp.*	
Deer's tongue	*Carphephorus odoratissimus*	
Blue beech	*Carpinus caroliniana*	
Pignut hickory	*Carya glabra*	
Sugarberry	*Celtis laevigata*	
Buttonbush	*Cephalanthus occidentalis*	
Redbud	*Cercis canadensis*	
Partridge pea	*Chamaecrista fasciculata*	
Slender woodoats	*Chasmanthium laxum*	
Fringe-tree	*Chionanthus virginicus*	
Maryland goldenaster	*Chrysopsis mariana*	
Spotted water hemlock	*Cicuta maculata*	
Deer lichen	*Cladina sp.*	
Stinging nettle	*Cnidoscolus stimulosus*	
Swamp dogwood	*Cornus femina*	
Flowering dogwood	*Cornus florida*	
Seven sisters	*Crinum americana*	
Rabbit-bells	*Crotalaria rotundifolia*	
Healing croton	*Croton argyranthemus*	
Titi	*Cyrilla racemiflora*	
Woodvamp	*Decumaria barbara*	
Beggar's lice	*Desmodium rotundifolium*	
Witchgrass	*Dichanthelium sp.*	
Carolina ponysfoot	*Dichondra caroliniensis*	
Persimmon	*Diospyros virginiana*	
Water hyacinth *	*Eichhornia crassipes*	
Elephant’s foot	*Elephantopus sp.*	
Centipede grass *	*Eremochloa ophiuroides*	
Dog fennel	*Eupatorium capillifolium*	

*Non-native Species

Natural Bridge Battlefield Historic State Park
Plants

Common Name	*Scientific Name*	Primary Habitat Codes (for designated species)
Euphorbia	*Euphorbia inundata*	
American beech	*Fagus grandifolia*	
Carolina ash	*Fraxinus caroliniana*	
Cottonweed	*Froelichia floridana*	
Southern garua	*Garua angustifolia*	
Dwarf huckleberry	*Gaylussacia dumosa*	
Trumpetflower	*Gelsemium sempervirens*	
Rabbit-tobacco	*Gnaphalium obtusifolium*	
Loblolly bay	*Gordonia lasianthus*	
Witch hazel	*Hamamelis virginiana*	
Roundleaf bluet	*Houstonia procumbens*	
Marsh pennywort	*Hydrocotyl sp.*	
Hydrilla *	*Hydrilla verticillata*	
Spider-lily	*Hymenocallis rotata*	
St. Andrew's cross	*Hypericum hypericoides*	
Gallberry	*Ilex glabra*	
American holly	*Ilex opaca*	
Yaupon	*Ilex vomitoria*	
Florida anise-tree	*Illicium floridanum*	
Virginia willow	*Itea virginica*	
Leathery rush	*Juncus coriaceus*	
Soft rush; Lamp rush	*Juncus effusus*	
Eastern red cedar	*Juniperus virginiana*	
Lantana *	*Lantana camara*	
Duckweed	*Lemna sp.*	
Sweetgum	*Liquidambar styraciflua*	
Creeping primrose-willow	*Ludwigia repens*	
Rusty staggerbush	*Lyonia ferruginea*	
Coastal plain staggerbush	*Lyonia fruticosa*	
Fetterbush lyonia	*Lyonia lucida*	
Southern magnolia	*Magnolia grandiflora*	
Sweet bay	*Magnolia virginiana*	
Climbing hempvine	*Mikania scandens*	
Partridge berry	*Mitchella repens*	
Red mulberry	*Morus rubra*	
Southern bayberry	*Myrica caroliniensis*	
Wax myrtle	*Myrica cerifera*	
American white waterlily	*Nymphaea odorata*	
Swamp tupelo	*Nyssa biflora*	
Black gum	*Nyssa sylvatica*	
Basket grass	*Oplismenus sp.*	
Prickly pear	*Opuntia humifusa*	
Cinnamon fern	*Osmunda cinnamomea*	
Sorrel	*Oxalis dillenii*	
Butterweed	*Packera glabella*	
Beaked panicum	*Panicum anceps*	

*Non-native Species

Natural Bridge Battlefield Historic State Park
Plants

Common Name	*Scientific Name*	Primary Habitat Codes (for designated species)
Maiden cane	*Panicum hemitomon*	
Virginia creeper	*Parthenocissus quinquefolia*	
Bahiagrass	*Paspalum notatum*	
Green arrow arum	*Peltandra virginica*	
Red bay	*Persea borbonia*	
Swamp bay	*Persea palustris*	
Mistletoe	*Phoradendron serotinum*	
Slash pine	*Pinus elliottii*	
Spruce pine	*Pinus glabra*	
Longleaf pine	*Pinus palustris*	
Loblolly pine	*Pinus taeda*	
Water lettuce	*Pistia stratioides*	
Narrowleaf silkgrass	*Pityopsis graminifolia*	
Sycamore	*Platanus occidentalis*	
Tall jointweed	*Polygonella gracilis*	
Resurrection fern	*Polypodium polypodioides*	
Pickerelweed	*Pontederia cordata*	
Waterweed	*Potamogeton* sp.	
American plum	*Prunus americana*	
Chickasaw plum	*Prunus angustifolia*	
Black cherry	*Prunus serotina*	
Bracken fern	*Pteridium aquilinum*	
Blackroot	*Pterocaulon pycnostachyum*	
White oak	*Quercus alba*	
Sand live oak	*Quercus geminata*	
Laurel oak	*Quercus hemisphaerica*	
Turkey oak	*Quercus laevis*	
Diamond leaf oak	*Quercus laurifolia*	
Sand post oak	*Quercus margaretta*	
Swamp chestnut oak	*Quercus michauxii*	
Dwarf live oak	*Quercus minima*	
Water oak	*Quercus nigra*	
Runner oak	*Quercus pumila*	
Virginia live oak	*Quercus virginiana*	
Pink azalea	*Rhododendron canescens*	
Winged sumac	*Rhus copallinum*	
Beakrush	*Rhynchospora sp.*	
Dewberry	*Rubus trivialis*	
Ruellia	*Ruellia sp.*	
Dwarf palmetto	*Sabal minor*	
Cabbage palm	*Sabal palmetto*	
Swamp pink	*Sabatia calycina*	
Grassy arrowhead	*Sagittaria graminea*	
Black willow	*Salix nigra*	
Lyre-leaved sage	*Salvia lyrata*	
Elderberry	*Sambucus nigra*	

*Non-native Species

Natural Bridge Battlefield Historic State Park
Plants

Common Name	*Scientific Name*	Primary Habitat Codes (for designated species)
Black horse root	*Sanicula smallii*	
Sassafras	*Sassafras albidum*	
Lizard's tail	*Saururus cernuus*	
Saw palmetto	*Serenoa repens*	
Gum bully	*Sideroxylon languinosum*	
Blue-eyed grass	*Sisyrinchium nashii*	
Catbrier	*Smilax pumila*	
Greenbrier	*Smilax sp.*	
Marsh ladiestresses	*Spiranthes odorata*	
Dropseed	*Sporobolus sp.*	
St. Augustine grass	*Stenotaphrum secundatum*	
Horse sugar	*Symplocos tinctorum*	
American baldcypress	*Taxodium distichum*	
American basswood	*Tilia americana*	
Ball moss	*Tillandsia recurvata*	
Poison ivy	*Toxicodendron radicans*	
American elm	*Ulmus americana*	
Sparkleberry	*Vaccinium arboreum*	
Blueberry	*Vaccinium darrowi*	
Elliot's blueberry	*Vaccinium elliotii*	
Shiny blueberry	*Vaccinium myrsinites*	
Deer berry	*Vaccinium stamineum*	
Small-leaf arrowleaf	*Viburnum obovatum*	
Violet	*Viola sp.*	
Wild grape	*Vitis sp.*	
Netted chain fern	*Woodwardia areolata*	
Yellow eyed grass	*Xyris sp.*	
Adam's needle	*Yucca filimentosa*	

*Non-native Species

Natural Bridge Battlefield Historic State Park

Animals

Common Name	*Scientific Name*	Primary Habitat Codes (for all species)
	AMPHIBIANS	
Cricket frog	*Acris gryllus*	31, 33
Southern toad	*Bufo terrestris*	MTC
Green treefrog	*Hyla cinerea*	17, 50
Bullfrog	*Rana catesbeiana*	31, 33
Bronze frog	*Rana clamitans clamitans*	31, 33
Southern leopard frog	*Rana utricularia*	31, 33
	REPTILES	
Cottonmouth	*Agkistrodon piscivorus*	31, 33
American alligator	*Alligator mississippiensis*	50, 53
Green anole	*Anolis carolinensis carolinensis*	MTC
Common snapping turtle	*Chelydra serpentina*	50, 53
Suwannee cooter	*Chrysemys concinna*	50, 53
Florida cooter	*Chrysemys floridana*	50, 53
Southern black racer	*Coluber constrictor priapus*	MTC
Eastern diamondback rattlesnake	*Crotalus adamanteus*	8, 28
Gray rat snake	*Elaphe obsoleta*	MTC
Southeastern five-lined skink	*Eumeces inexpectatus*	MTC
Broad-headed skink	*Eumeces laticeps*	MTC
Gopher tortoise	*Gopherus polyphemus*	13, 81
Eastern kingsnake	*Lampropeltis getula*	MTC
Alligator snapping turtle	*Macroclemys termmincki*	50, 53
Brown water snake	*Nerodia taxispilota*	50, 53
Box turtle	*Terrapene carolina*	MTC
Southern fence lizard	*Sceloporus undulatus*	MTC
Ground skink	*Scincella laterale*	MTC
	BIRDS	
Red-winged blackbird	*Agelaius phoeniceus*	53, 81
Wood duck	*Aix sponsa*	50, 53
Northern pintail	*Anas acuta*	50, 53
Blue-winged teal	*Anas discors*	50, 53
Limpkin	*Aramus guarauna*	33, 53
Ruby-throated hummingbird	*Archilochus colubris*	MTC
Great egret	*Ardea alba*	53
Great blue heron	*Ardea herodias*	53
Tufted titmouse	*Baeolophus bicolor*	MTC
Cedar waxwing	*Bombycilla cedrorum*	MTC
Red-shouldered hawk	*Buteo lineatus*	OF
Red-tailed hawk	*Buteo jamaicensis*	MTC
Chuck-will's-widow	*Caprimulgus carolinensis*	OF

*Non-native Species

Natural Bridge Battlefield Historic State Park

Animals

Common Name	*Scientific Name*	Primary Habitat Codes (for all species)
Northern cardinal	*Cardinalis cardinalis*	MTC
Great egret	*Casmerodius albus*	53
Turkey vulture	*Cathartes aura*	MTC
Chimney swift	*Chaetura pelagica*	81
Common nighthawk	*Chordeiles minor*	OF
Yellow-billed cuckoo	*Coccyzus americanus*	MTC
Northern bobwhite	*Colinus virginianus*	OF
Common ground-dove	*Columbina passerina*	MTC
Black vulture	*Coragyps atratus*	MTC
American crow	*Corvus brachyrhynchos*	81
Fish crow	*Corvus ossifragus*	81
Blue jay	*Cyanocitta cristata*	81
Pine warbler	*Dendroica pinus*	31, 81
Pileated woodpecker	*Dryocopus pileatus*	13, 81
Little blue heron	*Egretta caerulea*	53
Swallow-tailed kite	*Elanoides forficatus*	OF
Acadian flycatcher	*Empidonax virescens*	81
Southern bald eagle	*Haliaeetus leucocephalus*	31
Mississippi kite	*Ictinia mississipiensis*	31
Belted kingfisher	*Megaceryle alcyon*	33, 53
Red-bellied woodpecker	*Melanerpes carolinus*	MTC
Red-headed woodpecker	*Melanerpes erythrocephalus*	28, 81
Wild turkey	*Meleagris gallopavo*	OF
Northern mockingbird	*Mimus polyglottos*	81
Brown-headed cowbird	*Molothrus ater*	MTC
Wood stork	*Mycteria americana*	OF
Great-crested flycatcher	*Myiarchus crinitus*	MTC
Osprey	*Pandion haliaetus*	OF
Northern parula	*Parula americana*	31, 81
Tufted titmouse	*Parus bicolor*	31, 81
Painted bunting	*Passerina ciris*	81
Downy woodpecker	*Picoides pubescens*	MTC
Hairy woodpecker	*Picoides villosus*	8, 28
Rufous-sided towhee	*Pipilo erythrophthalmus*	81
Summer tanager	*Piranga rubra*	31
Carolina Chickadee	*Poecile carolinensis*	28, 81
Blue-gray gnatcatcher	*Polioptila caerulea*	31, 81
Purple martin	*Progne subis*	81
Prothonotary warbler	*Prothonotaria citrea*	31, 81
Eastern bluebird	*Sialia sialis*	81
Yellow-bellied sapsucker	*Sphyrapicus varius*	28, 81
Barred owl	*Strix varia*	31
European starling*	*Sturnus vulgaris*	81
Carolina wren	*Thryothorus ludovicianus*	31,81
Brown thrasher	*Toxostoma rufum*	81
American robin	*Turdus migratorius*	MTC

*Non-native Species

Natural Bridge Battlefield Historic State Park

Animals

Common Name	*Scientific Name*	Primary Habitat Codes (for all species)
Northern mockingbird	*Turdus polyglottos*	81
Yellow-throated vireo	*Vireo flavifrons*	28, 31
White-eyed vireo	*Vireo griseus*	31
Red-eyed vireo	*Vireo olivaceus*	31
Mourning dove	*Zenaida macroura*	31, 81
	MAMMALS	
North American beaver	*Castor canadensis*	53
Nine-banded armadillo *	*Dasypus novemcinctus*	28, 81
Virginia oppossum	*Didelphis virginiana*	28, 81
Northern yellow bat	*Lasiurus intermedius*	OF
River otter	*Lutra canadensis*	53
Whitetail deer	*Odocoileus virginianus*	MTC
Raccoon	*Procyon lotor*	MTC
Gray squirrel	*Sciurus carolinensis*	28, 81
Feral hog *	*Sus scrofa*	MTC
Eastern cottontail	*Sylvilagus floridanus*	28, 81
Gray fox	*Urocyon cinereoargenteus*	MTC
Black bear	*Ursus americanus*	MTC

*Non-native Species

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
46. Flatwoods/Prairie Lake
47. Marsh Lake

LACUSTRINE—Continued

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

Appendix 6—Imperiled Species Ranking Definitions

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

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

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

FNAI GLOBAL RANK DEFINITIONS

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

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

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

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

G5 ..... demonstrably secure globally

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

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

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

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

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

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

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

LEGAL STATUS

FEDERAL

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

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

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

STATE

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

FE ..... Federally-designated Endangered

FT ..... Federally-designated Threatened

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

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

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

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

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

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

Appendix 7—Cultural Information

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

A. General Discussion

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

B. Agency Responsibilities

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

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

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

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

C. Statutory Authority

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

D. Management Implementation

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

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

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

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

E. Minimum Review Documentation Requirements

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

* * *

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

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

Phone: (850) 245-6425

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

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

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

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

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

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

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

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

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

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

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

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

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