

Haw Creek Preserve State Park

Approved Plan Unit Management Plan

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL PROTECTION

Division of Recreation and Parks
December 16, 2016





Florida Department of Environmental Protection

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

Rick Scott
Governor

Carlos Lopez-Cantera
Lt. Governor

Jonathan P. Steverson
Secretary

December 19, 2016

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

RE: Haw Creek Preserve State Park (Lease #2992)
Paynes Creek Historic State Park (Lease #2809)
Lake June-in-Winter Scrub Preserve State Park (Lease #4105)
Lake Griffin State Park (Lease #3631)
Deer Lake State Park (Lease #4123)

Dear Ms. Murray:

On **December 16, 2016**, the Acquisition and Restoration Council recommended approval of the above management plans. Therefore, the Division of State Lands, Office of Environmental Services, acting as agent for the Board of Trustees of the Internal Improvement Trust Fund, hereby approves the above mentioned management plans. The next management plan update for these plans is due December 16, 2026.

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

Sincerely,

A handwritten signature in blue ink, appearing to read "Ray Spaulding", is written over the typed name.

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

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INTRODUCTION

Haw Creek Preserve State Park is located in Flagler and Volusia Counties (see Vicinity Map). Access to the park is from State Road 100, south on Flagler CR 305, west on CR 2006 and south on CR 2007 to its terminus at Russell Landing Park (see Reference Map). The Vicinity Map also reflects significant land and water resources existing near the park.

Haw Creek Preserve State Park was initially acquired on December 2, 1976 as a donation by The Nature Conservancy. Currently, the park comprises 3,061 acres. The Board of Trustees of the Internal Improvement Trust Fund (Trustees) hold fee simple title to the park and on August 15, 1977, the Trustees leased (Lease Number 2991) the property to DRP under a 99-year lease. The current lease will expire on August 14, 2076.

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

Purpose and Significance of the Park

The purpose of Haw Creek Preserve State Park is to preserve, maintain and enhance the integrity of the park's natural communities and wildlife habitat and provide opportunities for resource-based outdoor recreation and nature appreciation.

Park Significance

- The extensive wetlands in the park (approximately 3,000 acres of floodplain swamp and basin marsh) contribute significantly to the protection of water quality in the Crescent Lake-Haw Creek watershed of the Lower St. John's River Basin.
- The wetlands of the park provide significant foraging and nesting habitat for a number of imperiled wading bird species including Little Blue Heron, Snowy Egret, Reddish Egret, Tri-colored Heron, White Ibis and Limpkin.
- Haw Creek provides an outstanding blackwater stream experience and opportunities for a variety of water-based recreational opportunities including paddling, boating, fishing, and wildlife viewing for Florida residents and visitors.

Haw Creek Preserve State Park is classified as a state preserve in the DRP's unit classification system. In the management of a state preserve preservation and enhancement of natural conditions is all important. Resource considerations are given priority over user considerations and development is restricted to the minimum necessary for ensuring its protection and maintenance, limited access, user safety and convenience, and appropriate interpretation. Permitted uses are primarily of a passive nature, related to the aesthetic, educational and recreational

enjoyment of the preserve, although other compatible uses are permitted in limited amounts. Program emphasis is placed on interpretation of the natural and cultural attributes of the preserve.

Purpose and Scope of the Plan

This plan serves as the basic statement of policy and direction for the management of Haw Creek Preserve State Park as a unit of Florida's state park system. It identifies the goals, objectives, actions and criteria or standards that guide each aspect of park administration, and sets forth the specific measures that will be implemented to meet management objectives and provide balanced public utilization. The plan is intended to meet the requirements of Sections 253.034 and 259.032, Florida Statutes, Chapter 18-2, Florida Administrative Code, and is intended to be consistent with the State Lands Management Plan. With approval, this management plan will replace the 2003 approved plan.

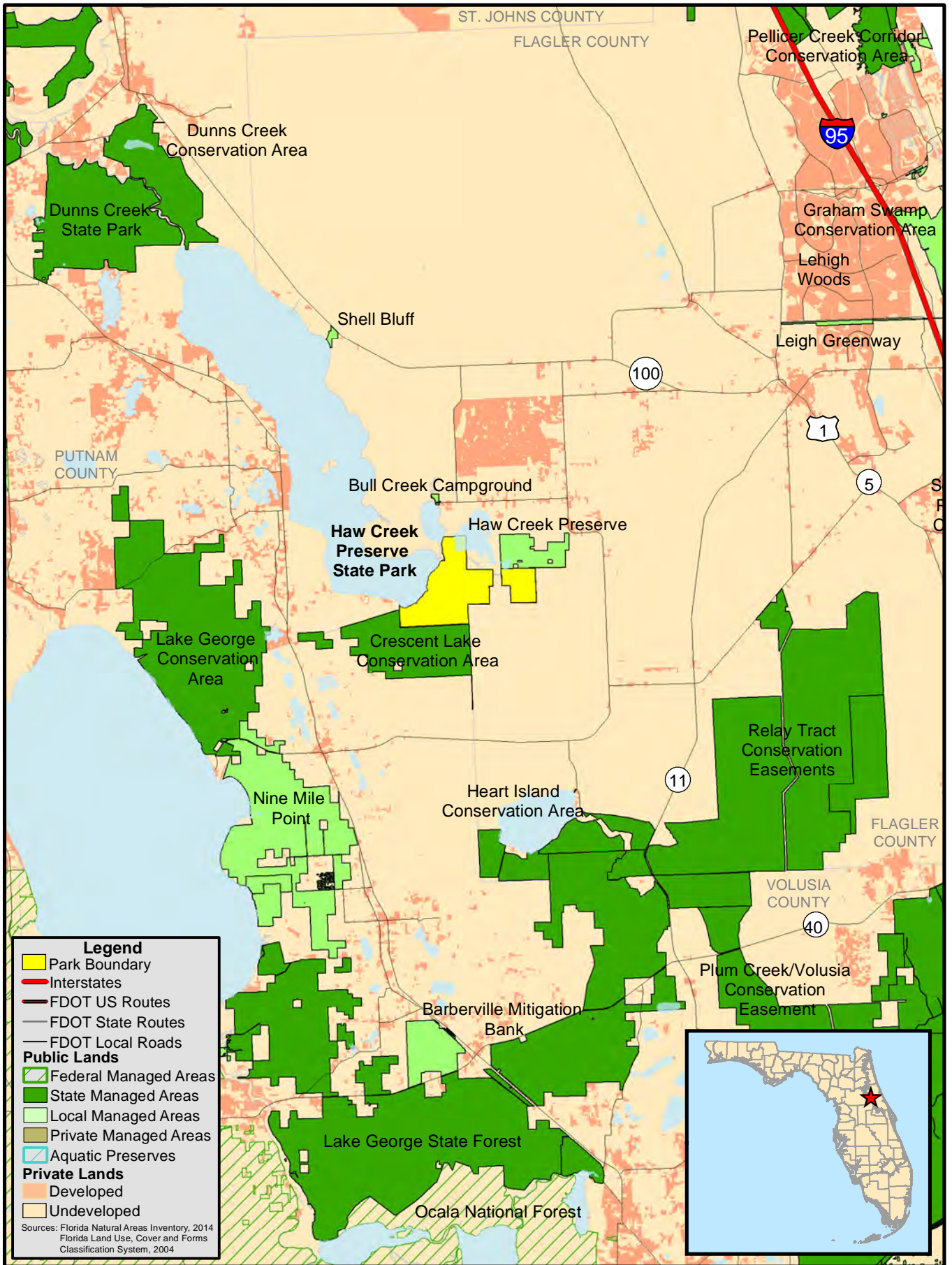
The plan consists of three interrelated components: the Resource Management Component, the Land Use Component and the Implementation Component. The Resource Management Component provides a detailed inventory and assessment of the natural and cultural resources of the park. Resource management needs and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

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

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

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

In the development of this plan, the potential of the park to accommodate secondary management purposes was analyzed. These secondary purposes were considered within the context of the DRP's statutory responsibilities and the



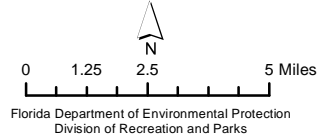
Legend

- Park Boundary
- Interstates
- FDOT US Routes
- FDOT State Routes
- FDOT Local Roads
- Public Lands**
- Federal Managed Areas
- State Managed Areas
- Local Managed Areas
- Private Managed Areas
- Aquatic Preserves
- Private Lands**
- Developed
- Undeveloped

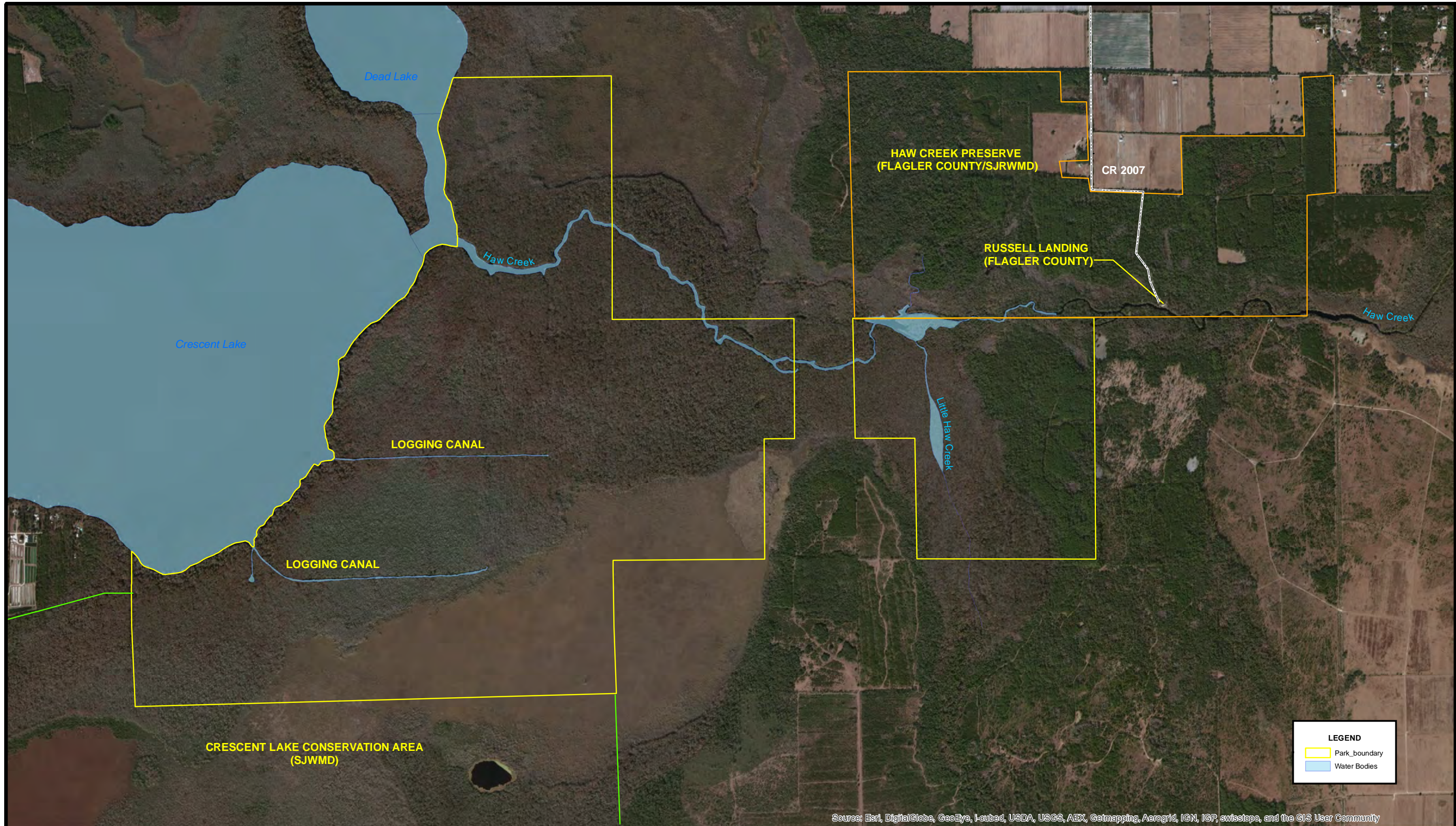
Sources: Florida Natural Areas Inventory, 2014
Florida Land Use, Cover and Forms Classification System, 2004



**HAW CREEK PRESERVE
STATE PARK**



**VICINITY
MAP**



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

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

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

Management Program Overview

Management Authority and Responsibility

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

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

preservation of historic sites and memorials of statewide significance and interpretation of their history to the people; to contribute to the tourist appeal of Florida.

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

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

Park Management Goals

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

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

Management Coordination

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

The Florida Department of Agriculture and Consumer Services (FDACS), Florida Forest Service (FFS), assists DRP staff in the development of wildfire emergency

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

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 June 15 and 16, 2016, respectively. Meeting notices were published in the Florida Administrative Register, June 9, 2016 [Volume 42/112], included on the Department Internet Calendar, posted in clear view at the park, and promoted locally. The purpose of the Advisory Group meeting is to provide the Advisory Group members an opportunity to discuss the draft management plan (see Addendum 2).

Other Designations

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

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

RESOURCE MANAGEMENT COMPONENT

Introduction

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

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

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

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

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

Management Zone	Acreage	Managed with Prescribed Fire	Contains Known Cultural Resources
HC 1	761.60	Partially	yes
HC 2	2,300.00	Partially	yes

Resource Description and Assessment

Natural Resources

Topography

The preserve is located in the Crescent Lake Basin subdivision of the Eastern Flatwoods District (Brooks 1981a). This physiographic region includes the lowlands surrounding Crescent Lake and Haw Creek. The highest elevation in the preserve is 10 feet MSL at the southeastern corner of the Management Zone HC 1. The pine flatwoods, which comprise most of the upland areas in the preserve, are on a gradual topographic slope from about 10 feet MSL to 5 feet MSL. The remainder of management zones HC 1 and all of HC 2 are in the floodplain of Haw Creek and Little Haw Creek, below the 5-foot elevation contour.

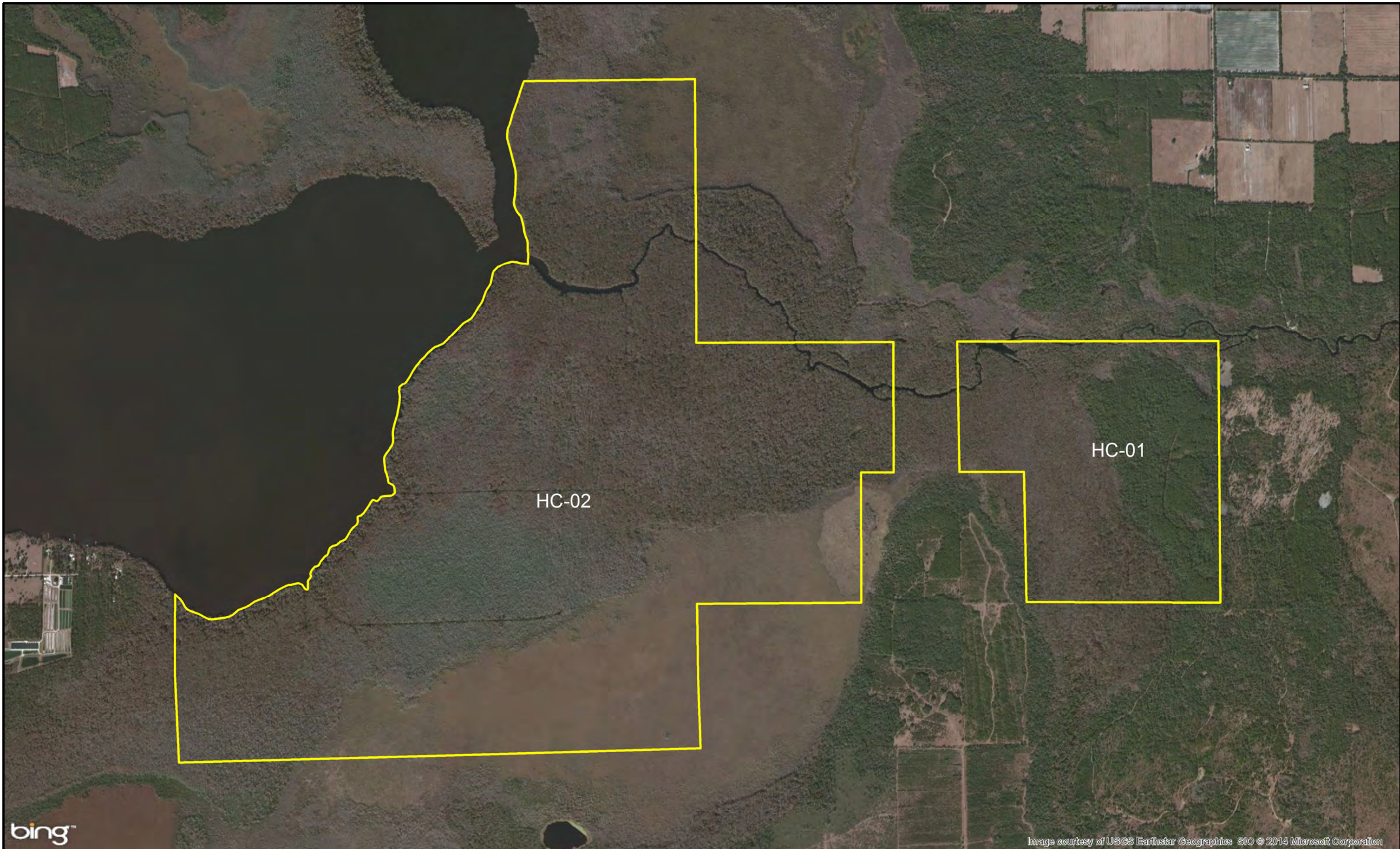
Geology

The lowlands around Crescent Lake and Haw Creek are mapped as Holocene fluvial sediments (Scott 1992). These are geologically recent deposits of river alluvium composed of quartz sands, silt, clay and shelly carbonate sediments. Peat and other organic-rich sediments are also present in this lowland basin. The subsurface strata are undifferentiated beds of sand, clay, and shell sediments that overlie the Eocene limestone formations of the Ocala Group, about 100 feet below mean sea level.

Soils

The Natural Resources Conservation Service (formerly the U.S. Soil Conservation Service) identified four soil types in Haw Creek Preserve State Park (see Soil Map) in the soil surveys of Flagler and Volusia Counties (Readle et al. 1993, Baldwin et al. 1980). Addendum 4 contains detailed descriptions of the soil types in Haw Creek Preserve.

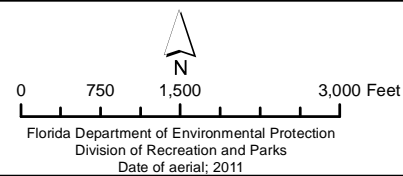
There are two areas in the preserve where soil erosion is evident. The first is the edge of the floodplain bordering Crescent Lake. Numerous trees along the shoreline have been uprooted by the combined action of waves and high winds. The exposed substrate is washed into the littoral sediments of lake. This erosion appears to be largely a natural process. Although powerboats use the lake, they tend to avoid the shallow littoral where anglers often anchor off the bull-lily beds.



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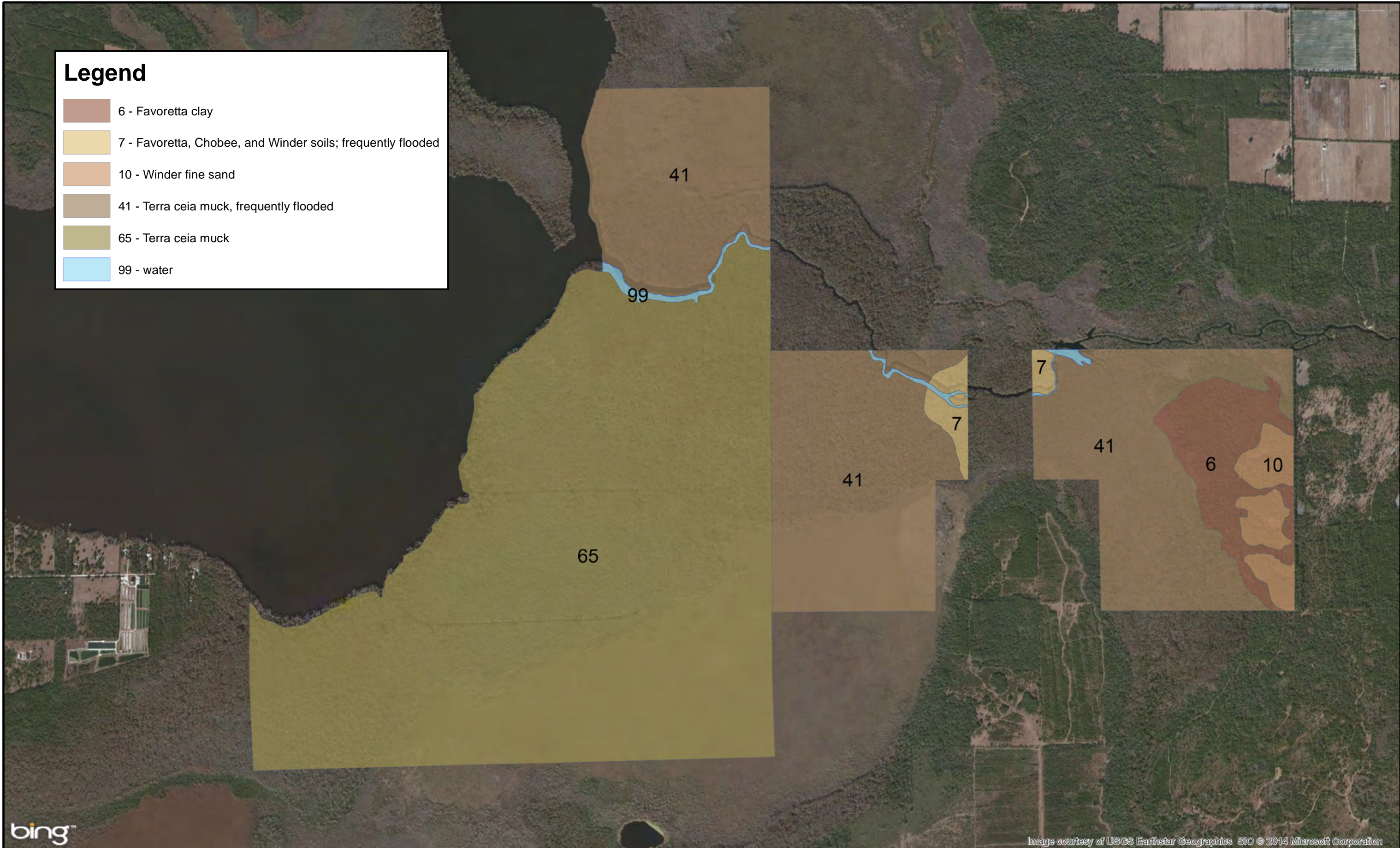
HAW CREEK PRESERVE STATE PARK



MANAGEMENT ZONES MAP

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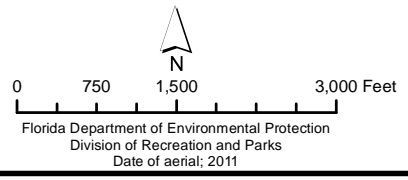
- 6 - Favoretta clay
- 7 - Favoretta, Chobee, and Winder soils; frequently flooded
- 10 - Winder fine sand
- 41 - Terra ceia muck, frequently flooded
- 65 - Terra ceia muck
- 99 - water



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HAW CREEK PRESERVE STATE PARK



SOILS MAP

The second source of soil erosion is ground disturbance in the pine flatwoods area of the preserve. The clay soils of the low flatwoods are especially vulnerable to erosion during the wet season. Use of wet roads by heavy equipment, or even service vehicles, may leave deep ruts and holes in the soft clay substrate, which being highly impermeable, will retain ponded water and produce silted runoff during heavy rains. Additionally, historic firebreaks and plowlines can channelize runoff, even decades after they were established.

Minerals

There are no known deposits of commercial value at Haw Creek Preserve State Park.

Hydrology

Haw Creek Preserve State Park is in the Crescent Lake-Haw Creek watershed of the Lower St. Johns River Basin (SJRWMD 1997). The preserve boundaries enclose portions of the lower reaches of Haw Creek between Russell Landing and the outlet of Dead Lake at the southeastern end of Crescent Lake. The eastern parcel includes the confluence of Haw Creek and Little Haw Creek, which flows north from Lake Disston, and the outlet of Gator Slough that flows southeasterly from Mud Lake. The western parcel includes about 1 mile of shoreline on Dead Lake and about 2.5 miles of shoreline along Green Bay, an embayment at the southeast end of Crescent Lake.

Crescent Lake is the ninth largest lake in Florida with a surface area of 26.8 square miles. Dead Lake is 5.7 square miles. The Haw Creek watershed drains a 400 square mile area in western Flagler and north central Volusia County (Rumenik and Grubbs 1996). The basin includes Haw Creek (109-sq. mi.), Middle Haw Creek (165-sq. mi.), Little Haw Creek (93-sq. mi.), Black Branch (15-sq. mi.), and Sweetwater Branch (11-sq. mi.).

Haw Creek, Little Haw Creek, and Crescent Lake are listed as Class III waters by the State of Florida. The portions of Haw Creek and Little Haw Creek within the preserve are Outstanding Florida Waters (OFW), a standard designation for surface waters in state parks and preserves. In January 2000, the Environmental Regulation Commission designated Lake Disston and portions of Little Haw Creek as OFW. This includes the channels and contiguous wetlands of Little Haw Creek between Lake Disston and the confluence of Haw Creek in the preserve. The designation will provide additional regulatory protection for Little Haw Creek, but other tributaries to Haw Creek will also require more protection to improve deteriorating water quality that has been documented in the watershed. The DEP Water Quality Assessment 305 (b) Report of 1996 (Hand et al. 1996) indicated "poor" water quality in lower Haw Creek above the outlet at Crescent Lake, which includes OFW waters in the preserve. Additionally, water quality data retrieved from St. Johns Water Management District in May 2012 still listed the overall water quality as low for the sampling station, which was located at the mouth of Haw

Creek near the confluence of Haw Creek and Crescent Lake (<http://www.sjrwmd.com/watershedfacts/factPages/HAW.html>).

Concentrations of several parameters exceeded FDEP water-quality standards (Chapter 62-302, F.A.C.). A comprehensive assessment, which includes an evaluation of non-point source pollution in the basin among other criteria, describes water quality conditions in lower Haw Creek that would not support the statutory uses for Class III waters that are designated "for recreation, propagation, and maintenance of a healthy, well-balanced population of fish and wildlife (F.A.C. 17-302.400). A 1990 lake study found blue-green algal blooms and high chlorophyll-a concentration in Dead Lake and Crescent Lake; both lakes were described as eutrophic. The discharge of Haw Creek was cited as a significant nutrient input to Crescent Lake, originating from agricultural runoff in the watershed. At the time of the 1990 study, the Bunnell wastewater plant discharged treated effluent to the Haw Creek watershed. According to SJRWMD in 2012, there were "no wastewater treatment facilities within a five-mile radius or within the drainage basin of this water quality site" (St. Johns River Water Management District 2012). Fortunately, mercury is not among the pollutants identified in Haw Creek. This metal accumulates in aquatic food chains, particularly in top carnivores such as largemouth bass. No public health advisories have been issued at Haw Creek due to mercury contamination.

Several logging canals in the preserve were used to float cut cypress out of the floodplain prior to state ownership. The hydrological impact of the canals has not been evaluated.

Natural Communities

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

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

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

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

Basin Marsh

Desired future condition: The basin marsh includes emergent herbaceous and low shrub species dominating most of the area with an open vista. Trees will be few and if present occur primarily in the deeper portions of the community. There will be little accumulation of dead grassy fuels due to frequent burning; one will be able to see the soil surface through the vegetation when the community is not inundated. Dominant vegetation in basin marsh will include maidencane (*Panicum hemitomon*), cutgrass (*Leersia sp.*), sand cordgrass (*Spartina bakeri*), soft rush (*Juncus effusus subsp. Solutus*) sawgrass (*Cladium jamaicense*), common reed (*Phragmites australis*), pickerelweed (*Pontederia cordata*), arrowheads (*Sagittaria sp.*), buttonbush (*Cephalanthus occidentalis*), St. John's wort (*Hypericum fasciculatum*), and coastalplain willow (*Salix caroliniana*). The Optimal Fire Return Interval for this community is 2-10 years depending on fire frequency of adjacent communities.

Description and assessment: There are 701 acres of basin marsh in Haw Creek Preserve; the majority are found in management zone HC 2. The dominant groundcover here is sawgrass with secondary components of sand cordgrass, soft rush, giant cutgrass (*Zizaniopsis miliacea*), swamp rosemallow (*Hibiscus grandiflorus*) and arrowhead. Some coastalplain willow is present. There is some hardwood encroachment, mainly by red maple (*Acer rubrum*), water locust (*Gleditsia aquatica*), and cypress (*Taxodium spp.*). There is also some scattered infestation of the FLEPPC Class II invasive exotic rattlebox (*Sesbania punicea*). This infestation was treated during the 09/10 and 10/11 fiscal years; follow-up will be necessary to ensure maintenance conditions are achieved. Because of the hardwood encroachment and required follow-up treatment on the rattlebox, the basin marsh at Haw Creek Preserve is assessed to be in fair to good condition.

General management measures: Continuation of the correct fire interval, in addition to follow-up treatments on the *Sesbania punicea* will bring this assemblage into the desired future condition. Fire lines and an agreement with the adjacent

land owner are needed in order to apply fire to this community since the park only manages a portion of the basin marsh.

Blackwater Stream

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

Description and assessment: There are 32 acres of blackwater stream at Haw Creek Preserve State Park. Haw Creek is a typical blackwater stream with dark tannic waters, naturally colored by swamp drainage. Blackwater streams are acidic (pH < 6) and may have low dissolved oxygen. The sparse vegetation within the preserve's blackwater streams is dominated by the emergent species spatterdock Nuphar advena and the waterlillies (*Nymphaea spp.*). Although biological diversity is often lower in blackwater streams than other stream types, Haw Creek supports an active recreational fishery for speckled perch (*Poxomis nigromaculatus*), shellcracker (*Lepomis microlopus*), largemouth bass (*Micropterus salmoides*), and catfish (*Ictalurus spp.*). Florida gar (*Lepisosteus platyrhincus*) and mudfish (*Amia calva*) are common in the blackwater streams of the preserve. The blackwater streams in the preserve are assessed to be in good to excellent condition.

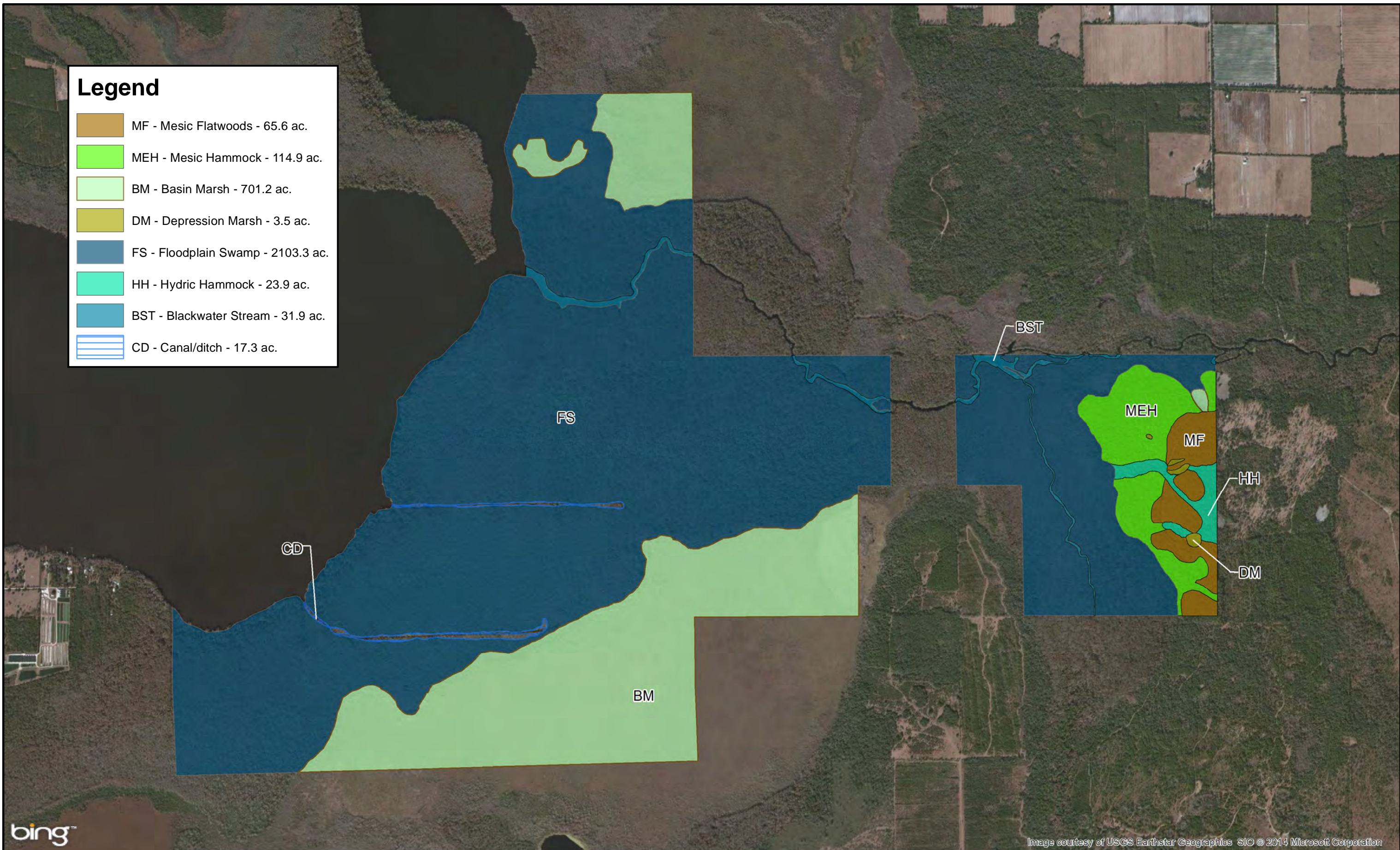
General management measures: Removal of the periodic influxes of water hyacinth (*Eichhornia crassipes*) and water spangles (*Salvinia minima*) will bring this assemblage into good condition. This effort will need to be coordinated through the FWC Invasive Plant Management Section, and the U.S. Army Corps of Engineers aquatic weed spraying program.

Depression Marsh

Desired future condition: Depression marsh is characterized as containing low emergent herbaceous and shrub species which will be dominant over most of the area and include open vistas. Trees will be few and if present, will occur primarily in the deeper portions of the community. There will be little accumulation of dead grassy fuels due to frequent burning; one can often see the soil surface through the vegetation when the community is not inundated. Dominant vegetation in basin marsh and depression marsh may include maidencane (*Panicum hemitomon*), panic grasses (*Panicum spp.*), cutgrass (*Leersia sp.*), common reed (*Phragmites australis*), pickerelweed (*Pontederia cordata*), arrowheads (*Sagittaria sp.*), buttonbush (*Cephalanthus occidentalis*), St. John's wort (*Hypericum fasciculatum*),

Legend

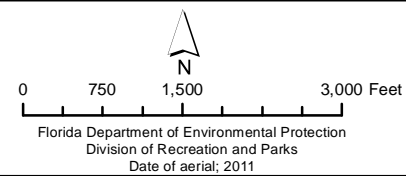
- MF - Mesic Flatwoods - 65.6 ac.
- MEH - Mesic Hammock - 114.9 ac.
- BM - Basin Marsh - 701.2 ac.
- DM - Depression Marsh - 3.5 ac.
- FS - Floodplain Swamp - 2103.3 ac.
- HH - Hydric Hammock - 23.9 ac.
- BST - Blackwater Stream - 31.9 ac.
- CD - Canal/ditch - 17.3 ac.



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HAW CREEK PRESERVE STATE PARK



NATURAL COMMUNITIES MAP

and coastalplain willow (*Salix caroliniana*). The Optimal Fire Return Interval for this community is 2-10 years depending on fire frequency of adjacent communities.

Description and assessment: There are 3.5 acres of depression marsh at Haw Creek Preserve State Park. The depression marshes here are quite similar to the basin marshes, they are just deeper with a slightly longer hydroperiod. The species composition is the same as in basin marsh. The basin marshes at Haw Creek Preserve are assessed to be in fair-good condition.

General management measures: Continuation of the correct fire-return interval will bring this assemblage into good condition. Fire lines and the appropriate adjacent landowner permissions are needed before fire can be applied to the depression marsh community.

Floodplain Swamp

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

Description and assessment: The floodplain swamp covers 2,103.3 acres at Haw Creek Preserve, and is comprised of bald cypress and a variety of deciduous hardwoods including swamp tupelo (*Nyssa sylvatica* var. *biflora*), red maple, pop ash (*Fraxinus caroliniana*), green ash (*Fraxinus pennsylvanica*), Florida elm (*Ulmus americana* var. *floridana*), sweetgum (*Liquidambar styraciflua*), water locust (*Gleditsia aquatica*) and laurel oak (*Quercus laurifolia*). The understory of the swamp is comprised of cabbage palm (*Sabal palmetto*), dwarf palm (*Sabal minor*), wax myrtle (*Morella cerifera*) and other vegetation growing on raised hammocks in the floodplain. The ground cover includes patches of swamp fern (*Blechnum serrulatum*), lizard's tail (*Saururus cernuus*), pickerweed (*Pontederia cordata*), and a several species of sedges (*Carex* spp.) and (*Cyperus* spp.). Epiphytic plants grow on the trunks and crown branches of floodplain trees, including greenfly orchid (*Epidendrum conopseum*) and butterfly orchid (*Encyclia tampensis*). There are six common epiphytic bromeliad species of Tillandsia: Spanish moss (*T. usneoides*), giant airplant (*T. utriculata*), Bartram's airplant (*T. bartramii*), Florida airplant (*T. simulate*), Florida airplant (*Tillandsia x floridana*), and ballmoss (*T. recurvata*). The floodplain swamps are in good condition.

General management measures: The floodplain swamp at Haw Creek is assessed to be in good condition. Due to its remote location and lack of disturbance, very little action currently needs to be taken to maintain this assemblage. Exotic species control will be needed to remove invasive exotic species as they are found.

Hydric Hammock

Desired future condition: Hydric hammock is characterized with a closed canopy, evergreen hardwood and/or palm forest with a variable understory dominated by palms, with sparse to moderate ground cover of grasses and ferns. Typical canopy species will include laurel oak, cabbage palm, live oak, sweetbay (*Magnolia virginiana*), swamp tupelo, American elm, red maple and other hydrophytic tree species. Soils will be poorly drained, with a normal hydroperiod seldom over 60 days per year. Hydric hammock should occasionally burn by allowing fires to naturally burn across ecotones from fires originating in adjacent upland natural communities.

Description and assessment: There are 23.8 acres of hydric hammock at Haw Creek Preserve, these mostly represent shallow-gradient ecotones rather than distinct assemblages. As fire has been excluded from the park, and feral swine do impact the area, the assemblage is assessed to be in fair condition.

General management measures: Periodic allowing of fires to cross the ecotone, plus the removal of feral swine will bring this assemblage into good condition.

Mesic Hammock

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

Description and assessment: There are 115 acres of mesic hammock at Haw Creek Preserve. These, as in the hydric hammock areas, are represented more as shallow-gradient ecotones between marsh areas and the mesic flatwoods than as distinct assemblages. The mesic hammock is dominated by live oak, red cedar (*Juniperus virginiana*) and cabbage palm, with occasional sweetgum, swamp red bay (*Persea palustris*), laurel oak and the occasional old-growth slash pine (*Pinus elliotii*). Some feral swine presence is noted.

General management measures: The mesic hammock is assessed to be in good condition. Removal of feral swine will assure this assemblage is maintained in desired state.

Mesic Flatwoods

Desired future condition: Within mesic flatwoods dominant pines will usually be longleaf pine (*Pinus palustris*) and slash pine. Native herbaceous groundcover should be over at least 50% of the area and less than 3 feet in height. Saw palmetto will comprise no more than 50% of total shrub species cover, and are also less than 3 feet in height. Other shrub species may include gallberry, fetterbush (*Lyonia lucida*), runner oak (*Quercus elliotii*), dwarf live oak (*Quercus minima*), shiny blueberry (*Vaccinium myrsinites*), and dwarf huckleberry (*Gaylussacia dumosa*). Shrubs will generally be knee-high or less, and there are few if any large trunks of saw palmetto along the ground. The Optimal Fire Return Interval for this community is 1-3 years.

Description and assessment: There were 65.6 acres of overgrown mesic flatwoods currently mapped at Haw Creek Preserve. Based on the historic aerial photographs and examining the soil types in the area, the extent of this community was slightly larger than it is today. Because fire has been excluded from this area, the negative impact of this exclusion is most evident in this community. Fuel loading is high; there is no gradation between canopy, midstory, or understory, and undesirable species such as sabal palm and wax myrtle are present in the midstory. Abundant evidence of turpentine (e.g., herty pots and catfaces on scattered large pine trees) also suggests the flatwoods were much more open in the 1930s and 1940's. Apparently, most of the flatwoods were harvested in the mid 1970's. Since then, natural regeneration of slash pine has dominated this community with an approximately 90% canopy closure. Groundcover is nearly absent. The mesic flatwoods at Haw Creek Preserve are in poor condition.

General management measures: A pine thinning through a timber harvest followed by a return of the proper burn interval will bring this assemblage into fair condition. Fire lines will need to be installed and a proper Right of Way (ROW) secured in order to carry out the above activities in a safe and affective manner. Extensive ground cover restoration, exotic plant control, and vegetation control will be needed to restore this community to a good state of health.

Altered Landcover Types

These areas comprise only a small acreage of the park. The one major type of altered landcover on the parcels that currently comprise the Haw Creek Preserve State Park is canal ditch. Based on observations of adjacent properties, most of the acreage that is currently as canal ditch was once floodplain swamp prior to conversion during timber operations. Below is a description of this altered landcover type.

Canal Ditch

In the late 1930s, two large canals totaling 17.3 acres were cut through the floodplain forest bordering Crescent Lake in order to timber portions of the floodplain swamp. It appears that these canals were used to access the trees in the swamp and then used to float the trees out to the lake, up Dunns Creek and to the St. Johns River to Palatka where they most likely were used for making furniture or houses. Restoring these canals may not be feasible due to their location and the disturbance caused by filling in these canals. Also, the canals, in their current state, could provide additional recreational opportunities in the park. These are discussed in the Land Use component of this plan.

Imperiled Species

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

Preliminary surveys for listed species have been conducted by park staff in all high-quality natural communities. Listed animal observations have been opportunistic and additional formal surveys are needed. It is likely that additional listed species will be found on the site with future surveys.

Twelve confirmed listed plant and animal species are known to occur on the Haw Creek Preserve State Park (Table 2). These include wading birds such as herons and egrets, as well as alligators, manatees, sturgeons, and the air plants.

Listed Plant Species

Giant air plant (*Tillandsia utriculata*): The giant air plant is the largest in the Bromeliaceae family native to Mexico, Costa Rica, Venezuela, and the United States. Some specimens can reach up to 3 feet in height almost 3 feet wide will leaves that are silver gray in color with small flowers that bloom on the end of a large flowering stock. This plant is an epiphyte which uses the tree it is attached to for nutrition from leaf litter and moisture from rain. This species is threatened species because of over collecting as well as habitat destruction in central and south Florida. It is also listed on the Florida endangered species list due to destruction by the Mexican Bromeliad Weevil (*Metamasius callizona*).

Listed Animal Species

American alligator (*Alligator mississippiensis*): Alligators, which are listed by the USFWS as a threatened species (due to its physical similarities to crocodiles), occur throughout the park and mainly along Haw Creek. The major threat to the species is illegal hunting.

Gopher tortoise (*Gopherus polyphemus*): The gopher tortoise is currently listed as state threatened by FWC mainly due to loss of habitat in Florida. Most of the tortoises in the park are found on the drier areas along the eastern perimeter where soils are dry and sandy within the pine plantation and historic mesic flatwoods community. The tortoise would benefit greatly from mechanical treatment to reduce the pine canopy in this area via a pine harvest/thinning or the use of prescribed fire and mowing/mulching. Due to the amount of material in these areas, it is recommended that a pine thinning be conducted to reduce the pine canopy by approximately 50 to 70% to encourage herbaceous groundcover growth. When found, tortoise burrows will be marked and protected.

Wading birds: The wetlands of the park provide foraging habitat for numerous wading birds that are listed as Florida Species of Special Concern, including the Little Blue Heron (*Egretta caerulea*), Reddish Egret (*Egretta rufescens*), Snowy Egret (*Egretta thula*), Tri-colored Heron (*Egretta tricolor*), White Ibis (*Eudocimus albus*) and Limpkin (*Aramus guarana*). The Wood Stork (*Mycteria americana*) is federally endangered. These wading birds utilize freshwater and coastal wetlands as foraging habitat. The major threat to these species is habitat destruction.

Florida manatee (*Trichechus manatus latirostris*): Manatees inhabit the shallow waters of Haw Creek within the park and can be found within Crescent Lake and up to the St. Johns River where they can access a great number of sites. The manatee, which is listed as endangered by state and federal authorities, has been greatly impacted by recreational activities such as boating and fishing. The major threats to the species are destruction of seagrass beds, accidental entanglements, and injuries incurred from collisions with boats (Smithsonian Marine Station, 2011).

Table 2 contains a list of all known imperiled species within the park and identifies their status as defined by various entities. It also identifies the types of management actions that are currently being taken by DRP staff or others, and identifies the current level of monitoring effort. The codes used under the column headings for management actions and monitoring level are defined following the table. Explanations for federal and state status as well as FNAI global and state rank are provided in Addendum 6.

Table 2: Imperiled Species Inventory						
Common and Scientific Name	Imperiled Species Status				Management Actions	Monitoring Level
	FWC	USFWS	FDACS	FNAI		
PLANTS						
Giant air plant <i>Tillandsia utriculata</i>			LE	S1	10	Tier 1

Table 2: Imperiled Species Inventory

Common and Scientific Name	Imperiled Species Status				Management Actions	Monitoring Level
	FWC	USFWS	FDACS	FNAI		
FISHES						
Shortnose Sturgeon <i>Acipenser brevirostrum</i>	FE	LE		G3S1	4, 10, 13	Tier 1
REPTILES						
Gopher tortoise <i>Gopherus polyphemus</i>	ST			G3S3	1,6, 7,10, 13	Tier 3
American alligator <i>Alligator mississippiensis</i>	FT(S/A)			G5S4	4	Tier1
BIRDS						
Limpkin <i>Aramus guarana</i>	SSC			G5S3	4	Tier 1
Little Blue Heron <i>Egretta caerulea</i>	SSC			G5S4	4	Tier 1
Reddish Egret <i>Egretta rufescens</i>	SSC			G4S2	4,2	Tier 1
Snowy Egret <i>Egretta thula</i>	SSC			G5S3	4,2	Tier 1
Tri-colored Heron <i>Egretta tricolor</i>	SSC			G5S4	4,2	Tier 1
White Ibis <i>Eudocimus albus</i>	SSC			G5S4	4,2	Tier 1
Wood Stork <i>Mycteria americana</i>	FT	LT		G4S2	4,2	Tier 1
MAMMALS						
West Indian manatee <i>Trichechus manatus manatus</i>	FE	LE		S2	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
- Other

Monitoring Level:

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

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

Exotic and Nuisance Species

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

Table 3 contains a list of the Florida Exotic Pest Plant Council (FLEPPC) Category I and II invasive, exotic plant species found within the park (FLEPPC 2013). The table also identifies relative distribution for each species and the management zones in which they are known to occur. An explanation of the codes is provided following the table. For an inventory of all exotic species found within the park, see Addendum 5.

Table 3: Inventory of FLEPPC Category I and II Exotic Plant Species			
Common and Scientific Name	FLEPPC Category	Distribution	Management Zone (s)
PLANTS			
Alligator weed <i>Alternanthera philoxeroides</i>	II	2	HC1, HC2
Camphor <i>Cinnamomum camphora</i>	I	2	HC1

Common and Scientific Name	FLEPPC Category	Distribution	Management Zone (s)
Wild taro <i>Colocasia esculenta</i>	I	3	HC2
Water hyacinth <i>Eichhornia crassipes</i>	I	6	HC2
Cogongrass <i>Imperata cylindrica</i>	I	2	HC1
Dotted duckweed <i>Landoltia punctata</i>	II	6	HC1, HC2
Tuberous sword fern <i>Nephrolepis cordifolia</i>	I	2	HC2
Torpedograss <i>Panicum repens</i>	I	2	HC1
Water lettuce <i>Pistia stratiotes</i>	I	6	HC1, HC2
Water spangles <i>Salvinia minima</i>	I	2	HC1, HC2
Chinese tallow <i>Sapium sebiferum</i>	I	2	HC1
Rattlebox <i>Sesbania punicea</i>	II	2	HC1

Distribution Categories:

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

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

The feral hog (*Sus scrofa*) and the nine-banded armadillo (*Dasypus novemcinctus*) can both be found throughout the preserve in all habitat types. Controlling these species will prove to be difficult because the preserve is within a matrix of private and conservation lands that do not currently control these species. Trapping and shooting of would be the primary forms of control for feral hogs and shooting for armadillo. In order to gain access to the site, a formal ROW easement will need to be obtained to allow private contractors, staff, and researchers to be able to access

the landward portions of the preserve. At this time, control of these species is recommended but not possible at this time.

There is evidence that livestock from neighboring cattle ranches are encroaching on the upland communities of HC1. DRP would not remove animals from the property, but would limit access by fencing off upland areas along the eastern boundary of HC1. Fencing should be addressed only after a ROW easement is obtained and timber management is completed.

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

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

Special Natural Features

The Haw Creek basin with blackwater streams branching through floodplain forests and open marshes has unique scenic qualities in addition to ecological and recreational values.

Cultural Resources

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

Condition Assessment

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

Level of Significance

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

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

The following is a summary of the FMSF inventory. In addition, this inventory contains the evaluation of significance.

Prehistoric and Historic Archaeological Sites

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

Description: Site 8FL908, an old boat landing, is overgrown with trees and vegetation and would be considered to be in fair condition. The site appears to be

stable. Sites 8VO9888 and 8VO9387 are two canals created around the 1930s to remove merchantable wood from the floodplain swamp and forest. On the 1942 aerials, you can see the loading decks and skid trails from the harvesting operations. Most likely, these trees were floated down the canals to the lake and then up Dunns Creek to Palatka where they were processed at the old cypress mill just East and North of Ravine Gardens State Park. Old photographs taken at the mill show cypress trees over 12 feet in diameter.

If feasible, sites 8VO9888 and 8VO9387 could be removed and restored back to floodplain swamp. Restoration in this area would be difficult since they are now a part of an outstanding waterway which has both biological and recreational advantages. Further evaluation and investigation is warranted before restoration of these areas are to take place.

An archaeological predictive model has been completed for the park (USF 2010). The model predicts areas of high, medium, and low probability for archaeological sites. The model indicates that approximately 46 acres of park property is designated as high sensitivity and 48 acres as medium sensitivity. All of this area is in the uplands in the eastern most section of the park. If any additional cultural sites are discovered, they will be recorded to the Florida Master Site File and managed according to DEP/DRP guidelines.

Level of Significance: Haw Creek Preserve contains three recorded cultural resources: an archaeological site of a boat landing and two resource groups, both logging canals. The boat landing and canals were created in the 1930s to remove timber from the floodplain swamp and forest. Further research and fieldwork is needed to identify their temporal and cultural associations, function, and condition. Their significance is unknown at this time.

General management measures: The primary treatment for these three sites would be preservation until they can be evaluated. Preservation includes protection from damage from resource management, natural causes, construction or human damage including looting. The recommended treatment for each site is indicated in the Table 4 below.

Historic Structures

At this time, no historic structures have been found in the park.

Collections

Currently there are no collections housed at the park.

Table 4 contains the name, reference number, culture or period, and brief description of all the cultural sites within the park that are listed in the Florida Master Site File. The table also summarizes each site's level of significance, existing condition and recommended management treatment. An explanation of the codes is provided following the table.

Table 4: Cultural Sites Listed in the Florida Master Site File					
Site Name and FMSF #	Culture/Period	Description	Significance	Condition	Treatment
Crescent Lake Canal #1 8VO9387	Historic, 1930s Timber Operation	Resouce Group/Linear Ditch	NE	G	P
Crescent Lake Canal #2 8VO9888	Historic, 1930s Timber Operation	Resource Group/Linear Ditch	NE	G	P
Haw Creek Landing 8FL908	Historic, 1930s	Archaeologic al Site/Boat Landing Area	NE	F	P

Significance:

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

Condition:

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

Recommended Treatment:

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

Resource Management Program

Management Goals, Objectives and Actions

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

While, DRP utilizes the ten-year management plan to serve as the basic statement of policy and future direction for each park, a number of annual work plans provide more specific guidance for DRP staff to accomplish many of the resource

management goals and objectives of the park. Where such detailed planning is appropriate to the character and scale of the park's natural resources, annual work plans are developed for prescribed fire management, exotic plant management and imperiled species management. Annual or longer-term work plans are developed for natural community restoration and hydrological restoration. The work plans provide DRP with crucial flexibility in its efforts to generate and implement adaptive resource management practices in the state park system.

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

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

Natural Resource Management

Hydrological Management

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

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

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

Haw Creek Preserve contains many wetlands that appear to be in good condition, but have not been truly evaluated by a hydrologist. A hydrological study is needed for the park which would include the potential restoration of the two 1930s canals

located in the western portion of the park. Along the banks of Haw Creek, there are numerous berms and mounds that appear to be artificial whereas others look as if they are natural features that may have been created by the creek itself, especially around an ox bow. Further investigation of these areas as well as the canals is warranted.

Objective: Collect and assemble surface water data from the SJRWMD and local authorities in order to identify point source pollution and possible solutions.

The waters of Haw Creek, Little Haw Creek and Crescent Lake are considered to be of poor quality and polluted with many different types of heavy metals and nitrates. The data being collected by the SJRWMD and local authorities needs to be collected and assembled in order to see if there are particular actions that can be taken to improve the quality of the surface waters within the preserve and the surrounding lands.

Natural Communities Management

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

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

Prescribed Fire Management

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

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

Objective: Within 10 years, have 87 acres of the preserve maintained within the optimum fire return interval.

The park is partitioned into management zones including those designated as burn zones (see Management Zones Table and Map). Prescribed fire is planned for each burn zone on the appropriate interval. The park's burn plan is updated annually because fire management is a dynamic process. To provide adaptive responses to

changing conditions, fire management requires careful planning based on annual and very specific burn objectives. Each annual burn plan is developed to support and implement the broader objectives and actions outlined in this ten-year management plan.

Table 5 contains a list of all fire-dependent natural communities found within the park, their associated acreage and optimal fire return interval, and the annual average target for acres to be burned. The “Annual Target Acreage” range is calculated by dividing the total acreage of each burn zone by the low end and by the high end of the “Optimal Fire Return Interval” assigned to each zone. The sum of all of the ranges for each zone represents the total “Annual Target Acreage Range.”

Table 5: Prescribed Fire Management		
Natural Community	Acres	Optimal Fire Return Interval (Years)
Basin Marsh	701.1	2-10
Mesic Flatwoods	65.6	2-4
Depression Marsh	3.5	2-4
Annual Target Acreage*	87 - 385	
*Annual Target Acreage Range is based on the fire return interval assigned to each burn zone. Each burn zone may include multiple natural communities.		

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

Haw Creek Preserve is currently broken into two management zones. HC2 is the entire western portion of the preserve that contains mainly floodplain swamp and basin marsh. The basin marsh is very large and is located on the south boundary of this zone. It extends off of the property onto a SJRWMD managed land and private property. Basin marsh is a fire maintained community, however, burning this community at the preserve will be nearly impossible because of its location. Currently, no fire lines exist onsite nor offsite on the other parcels. A fire line can not be installed along the preserve boundary because it is too wet to access and would be mainly grass. It would be nearly impossible to keep a prescribed fire within the confines of the preserve and preventing damage to private property. In order to burn this section of the park, additional lands will need to be purchased between the eastern and western portions of the park or a MOA (Memorandum of Agreement) will need to be written with the adjacent land owners to allow DRP to

access and burn their property. Securing and MOA of this type may prove to be difficult. At this time, the basin marsh in zone HC2 will not be include in the annual or long term burn plan for this park.

The western portion of the park, management zone HC1, contains a majority of the upland habitats for the park as well as the fire type habitat. This area of the preserve has been modified and disturbed numerous times by timber operations, vandals, feral hogs, and looters. Because there are no perimeter fire lines or fencing, unauthorized access is difficult if not impossible to control. The pine mesic flatwoods are currently in poor condition with a very high basal area, lack of ground cover, and many inches of fuel accumulation present. The 1940s historic aerial photographs show that the mesic flatwoods were once very open, with approximately 2 to 6 trees per acres. It was around that time that timbering operations expanded into the preserve and most likely harvested all of the merchantable timber. The last known harvest in this area took place in 1970s. Since then, pine regeneration from the cut grew up and now a great majority of the area contains 95 to 100% canopy cover of slash pine. These trees have grown so closely that they have shaded out most of the groundcover underneath them, leaving a very thick mat of needle cast. If a prescribed fire was attempted in this area now without any type of fuel reduction or mechanical treatment, the fire would be uncontrollable and could jeopardize the safety of the fire crew. Fuel reduction via a timber harvest is needed before that habitat within zone HC1 can be burned.

Objective: Install 1.2 miles of perimeter fire lines on the southern and eastern borders of management zone HC1.

In order at safety and effective burn the pine plantation within zone HC1, perimeter fire lines need to be installed along the southern and eastern boundaries of this zone. At this time, there are no lines or roads on the perimeter of the park that staff could use to burn off of. The 1.2 miles of fire line will be installed once a ROW easement is secured and a timber thinning operation takes place.

Natural Communities Restoration

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

Examples that would qualify as natural communities' restoration, requiring annual restoration plans, include large mitigation projects, large-scale hardwood removal and timbering activities, roller-chopping and other large-scale vegetative

modifications. The key concept is that restoration projects will go beyond management activities routinely done as standard operating procedures such as routine mowing, the reintroduction of fire as a natural process, spot treatments of exotic plants, and small-scale vegetation management.

Following are the natural community/habitat restoration and maintenance actions recommended to create the desired future conditions in the mesic flatwoods and depression marsh communities.

Objective: Conduct habitat/natural community restoration activities on 65.5 acres of mesic flatwoods and 3 acres of depression marsh by conducting a timber harvest.

Due to already previously mentioned extenuating circumstances, the mesic flatwoods at Haw Creek Preserve are in poor condition because of low pine regeneration due to fire suppression. In order to safely burn this community, a timber harvest must first be conducted. This harvest will thin the stand and simultaneously reduce the dense mid-story vegetation. Within 18 months following the timber harvest, prescribed fire should be applied, and then reapplied within the one to three year cycle appropriate for this assemblage. Photo points are recommended to record pre and post harvest results and the effects of fire on the landscape.

The gopher tortoise, a threatened species in Florida, has been documented in the pine plantation area of the preserve. This species would greatly benefit from the timber thinning and prescribed fire activities because depend on open stands that allow lush groundcover species to grow. The tortoise needs open areas to forage and to lay their eggs. They typically lay their eggs at the apron of the burrow, a few inches below the sand. Presently, there is not a lot of open area within this section of the preserve that would allow the tortoise to survive and thrive.

Imperiled Species Management

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

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

In the preparation of this management plan, DRP staff consulted with staff of the FWC's Imperiled Species Management or that agency's Regional Biologist and other appropriate federal, state and local agencies for assistance in developing imperiled

animal species management objectives and actions. Likewise, for imperiled plant species, DRP staff consulted with FDACS. Data collected by the USFWS, FWC, FDACS and FNAI as part of their ongoing research and monitoring programs will be reviewed by park staff periodically to inform management of decisions that may have an impact on imperiled species at the park.

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

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

When new species are found, they will be added to DRP's species databases in order to be tracked and documented as being present onsite. When the opportunity presents itself, DRP will organize sampling events once a formalized access point has been secured.

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

As described above in the natural community restoration section, the gopher tortoise can be found in numerous locations in zone HC1, particularly along roads and old fence lines. This species would greatly benefit from the timber thinning and prescribed fire activities because they depend on open stands that allow lush groundcover species to grow. Presently, there is not a lot of open area within this section of the preserve that would allow the tortoise to survive and thrive. After each harvest and burn, the habitat will be surveyed for tortoise burrows. Each burrow will be recorded with GPS and the status of the burrow will also be recorded in order to determine the estimated population density for the area. These surveys will be conducted periodically following management activities. The FWC statewide protocol for gopher tortoise monitoring will be followed.

All other imperiled species encountered on the park will be recorded with GPS and reported to FNAI.

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

The giant air plant is a threatened species in Florida because of over collecting as well as habitat destruction in central and south Florida. It is also listed on the Florida endangered species list due to destruction by the Mexican Bromeliad Weevil. Because of these reasons, this species will be monitored.

Exotic Species Management

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

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

Objective: Annually treat 5 acres of exotic plant species in the park.

The most common terrestrial, invasive exotic plant species in Haw Creek Preserve State Park are camphor tree and rattlebox. Both of these infestations are currently restricted to HC 1. There is also a scattered, low-level infestation of cogongrass within the mesic hammock and flatwoods of HC 1. Most of the camphor has been treated; follow-up and subsequent monitoring will be necessary to keep the park in maintenance for this species. There is also an infestation of alligatorweed within the basin marsh of HC 2 and sporadically along the shoreline of the entire park. Recently, the alligatorweed flea beetle has made a presence in the area, and the alligatorweed is displaying a subsequent lack of growth. Removal of alligatorweed should be discouraged as long as this natural control method is showing results.

Objective: Dependent upon gaining legal, easement access, implement control measures on two exotic animal species in the park.

There is evidence of two common exotic animal species within Haw Creek Preserve State Park: Nine-banded armadillo and feral hog. As both species are invasive, both cause varying degrees of ecological destruction, and the ground disturbing activities of both species are detrimental to cultural resources, they should be removed whenever possible. However, the only reasonable access to management zone HC 1 is through private property currently held by the Cowart Family of Flagler County. Because firearms usage is integral to exotic animal removal efforts, and because of Florida's unambiguous laws regarding firearms and trespass, no exotic animal removal efforts should proceed in HC 1 until either a written access agreement clearly allowing park staff to possess firearms while traversing the Cowart properties is obtained or a legal egress/ingress/regress easement is successfully negotiated and enacted.

Objective: Dependent upon gaining legal, easement access, control encroachment by neighboring livestock.

There is evidence that livestock are entering the preserve along the eastern boundary of HC1. Livestock can have several negative impacts on natural systems. Cattle can serve as vectors for invasive species. Cattle trails and wallows can alter local hydrology (i.e. drainage and sheetflow patterns). Additionally, after resource management actions are implemented (e.g., mechanical thinning and prescribed fire), grazing pressure by off-site livestock may negatively impact understory establishment. Their access should be prevented to the extent possible. Fencing of the upland boundary should be pursued once a legal ROW is obtained and timber management is completed.

Special Management Considerations

Timber Management Analysis

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

At Haw Creek Preserve State Park, a quantitative stand description of the pine plantation in management zone HC1 (see Addendum 8) was completed by park staff. FFS has recommended mechanical thinning of the stand from the present basal area of 146 sq. ft./acre (based on a .1 acre sample plot) to 70 sq. ft./acre, to reduce wildfire hazard and susceptibility to Southern Pine Beetle infestation, and to restore more natural stand conditions with the re-introduction of prescribed burning. Before timber thinning operations can take place, an official ROW (Right of Way) easement will need to be obtained from the surrounding landowner that will allow access to management zone HC1. Currently there is a verbal agreement between the land owner to the east and the park manager that allows staff to transverse their property to access the park. Access beyond that is by a case by case verbal agreement.

Arthropod Control Plan

All DRP lands are designated as "environmentally sensitive and biologically highly productive" in accordance with Ch. 388 and Ch. 388.4111 Florida Statutes. If a local mosquito control district proposes a treatment plan, DRP responds within the allotted time and reaches consensus with the mosquito control district. By policy of DEP since 1987, aerial adulticiding is not allowed, but larviciding and ground adulticiding (truck spraying in public use areas) is typically allowed. 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.

Cultural Resource Management

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

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

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

Objective: Assess and evaluate 3 of 3 recorded cultural resources in the park.

An assessment and evaluation of the three recorded archaeological sites will be completed.

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

Very little information and documentation exists for the three recorded sites located on the preserve. It is suspected that these sites are from the mid 1930s to early 1940s and the result of timber operations, but the sites have not been investigated by an archaeologist. A survey of these sites will be completed in conjunction with a

Level 1 archaeological survey for priority areas (medium and high sensitivity areas) identified by the 2010 predictive model.

Objective: Bring 1 of 3 recorded cultural resources into good condition

A regular monitoring program will be designed and implemented for Site 8FL908, an old boat landing that is considered to be in fair condition.

Resource Management Schedule

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

Land Management Review

Section 259.036, Florida Statutes, established land management review teams to determine whether conservation, preservation and recreation lands titled in the name of the Board of Trustees are being managed for the purposes for which they were acquired and in accordance with their approved land management plans. DRP considered recommendations of the land management review team and updated this plan accordingly.

Haw Creek Preserve State Park was subject to a land management review on 25 and 26 January 2012. The review team made the following determinations: The land is being managed for the purpose for which it was acquired. The actual management practices, including public access, complied with the management plan for this site.

LAND USE COMPONENT

Introduction

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

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

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

External Conditions

An assessment of 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.

Haw Creek Preserve State Park is located within Flagler and Volusia Counties, about 10 miles southwest of Bunnell in the northeastern part of the state. The population growth in Flagler and Volusia Counties has averaged 15 percent since 2005, and is projected to grow an additional 33 percent by 2025 (BEBR, University of Florida, 2014). As of 2012, 17 percent of residents in these counties were in the 5-19 age group, 40 percent in the 20-54 age group, 23 percent in the 65+ age group. The 65 and older age group is probably higher than the state average due to the large number of retirees that have moved to this area in recent years. This would also seem to explain why the 20-54 age group is lower than the state average (BEBR, University of Florida, 2014).

The population of Flagler and Volusia Counties is diverse in terms of demographic characteristics. According to U.S. Census data, approximately 25 percent of residents in the counties identify as black, Hispanic or Latino or another minority group (U.S. Census 2012). Over 1.2 million people reside within 50 miles of the park, which includes the cities of St. Augustine, Flagler Beach, Daytona Beach, New Smyrna Beach, Deltona, Ocala and Palatka (U.S. Census 2010).

The park is located in the Northeast Vacation Region, which includes Baker, Clay, Duval, Flagler, Nassau, Putnam, and St. Johns Counties. According to the 2011 Florida Visitor Survey, six percent of domestic visitors to Florida visited this region, of which 82 percent traveled for leisure. Visiting the beach/waterfront was the most popular activity with spring and summer being the most popular seasons. The average length of stay was 1-3 nights with an average expenditure of \$95 per person per day (Visit Florida 2011).

Within the vicinity of the park, there are many opportunities for resource-based recreation including hiking, biking, horseback riding, camping, picnicking, boating, paddling, fishing and hunting. Haw Creek Preserve, managed jointly by Flagler County and SJRWMD is adjacent to the park's north side. Bull Creek Campground, operated by Flagler County, is located a few miles northeast of the park on Dead Lake. Crescent Lake Conservation Area, managed by SJRWMD, is adjacent to the park's southwest side. Dunn's Creek Conservation Area (SJRWMD) and Dunn's Creek State Park are located between Crescent Lake and the St. Johns River.

Existing Use of Adjacent Lands

Although this region of Florida has undergone rapid urbanization over the past few decades, the land directly adjacent to the preserve remains undeveloped due to the extensive presence of wetlands. Some of the uplands in the surrounding area support residential and agricultural land uses. Cattle grazing occurs near the eastern side of the preserve, which has a slightly higher elevation than the rest of the site.

Adjacent to the park's southern boundary is Crescent Lake Conservation Area, a 3,528 acre parcel managed by the St. Johns River Water Management District (SJRWMD). The District maintains hiking trails and a primitive group camping area on the southwest corner of this property. There is no public access linking the park to the conservation area.

Another conservation area is adjacent to the park's north side. This 1,000-acre parcel, known as Haw Creek Preserve, is located on the north side of Haw Creek. This property is jointly managed by SJRWMD and Flagler County. The County maintains a boat launch (Russell Landing), picnicking, hiking, fishing and primitive camping facilities and a meeting facility available for reservation (Pellicer Community Center), at the end of CR 2007. A short boat ride (.7 miles) west from Russell Landing provides access to Haw Creek Preserve State Park.

Planned Use of Adjacent Lands

The Flagler County Future Land Use (FLU) designation for the properties to the north of the park is Conservation with the intent of protecting ecologically sensitive species or communities and regionally significant wildlife corridors. Improvements are limited to those that support public access and protection and management of the resources. Private properties to the east and southeast of the park are designated Agriculture and Timberland with the intent of protecting valuable agricultural and timber resources to maintain rural character (Flagler County 2010). The Flagler County zoning designation for adjacent properties is Agriculture (AC) with a maximum density of one dwelling unit per five acres (Flagler County 2014).

The Volusia County FLU designation for properties on the parks southwest side is Conservation. This includes areas that have been set aside to protect the county's natural resources. Improvements are limited to functions that are related to the protection, management, public access, security and conservation of the land (Volusia County 2014a). The Volusia County zoning designation for these properties is Resource Corridor (RC). This classification is intended to provide protected, natural corridors consisting of environmentally-sensitive and ecologically significant lands which connect to other protected areas such as parks and water bodies. The maximum density for this designation is one unit per 25 acres (Volusia County 2014b).

No significant land use changes are anticipated adjacent to the preserve. Minor residential development is expected on surrounding lands with higher elevations. Potential negative impacts of additional residential development around the preserve could include increased stormwater run-off, and the introduction of exotic ornamental plants.

Property Analysis

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

Recreational Resource Elements

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

Land Area

Nearly all of the preserve consists of poorly drained natural communities, with water present at or above ground level throughout a most of the year. Developable uplands are limited to a four-acre portion of upland mixed forest along the western boundary of the preserve.

At this time, there is no public upland access to the preserve. As previously mentioned, the closest public access to the unit is at Russell Landing within the Haw Creek Preserve. Flagler County maintains a boat ramp at Bull Creek Campground on the north side CR 2006.

Water Area

The preserve contains nearly three miles of shoreline on Dead and Crescent Lakes. Haw Creek and Little Haw Creek combine for slightly less than three miles of blackwater stream within preserve boundaries, and roughly two miles of old logging canals exist on the western side, connected to Crescent Lake. These lakes, streams and canals are the primary areas that receive visitor use through boating and canoeing/kayaking.

Shoreline

For the most part, the shorelines along Haw Creek, Dead Lake and Crescent Lake are floodplain swamp and unsuitable for recreation facilities. The spoil piles along the edge of the old logging canals are relatively dry and may offer some limited opportunities for picnicking, hiking and primitive camping.

Natural Scenery

Blackwater streams meandering through floodplain swamps and open marshes have a high scenic quality.

Significant Habitat

Haw Creek supports an active recreational fishery, and extensive wetlands and open water provide habitat for numerous wading birds including the endangered wood stork. The preserve supports nesting bald eagles and swallow-tailed kites visit the area's nest in floodplain forests and marshes. The surrounding forests provide suitable habitat for the Florida black bear and manatees are seen occasionally in Haw Creek.

Natural Features

The significant natural features in the park are the extensive floodplain swamp and blackwater streams. The swamp can be experienced from Haw Creek, along the shorelines of Crescent and Dead Lakes, and from the Crescent Lake logging canals.

Archaeological and Historical Features

The hydric hammock of the preserve contains slash pines with catfaced trunks that indicate turpentine operations were active in the area. The old logging canals on Crescent Lake provide tangible evidence of past timbering operations in the area and could be incorporated into interpretive programming.

Assessment of Use

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

Past Uses

Previous timbering of the unit removed most of the bald cypress trees along Crescent Lake, and the flatwoods were timbered by Union Camp Corp. before their donation to the state in 1976. The historic logging canals on the western side of the preserve, leading into Crescent Lake, were dug to aid in the removal of timber. The pine flatwoods also supported turpentine 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.

The FLU designations for both the Flagler County and Volusia County portions of the property are Conservation. Improvements related to the protection, management, public access, security and conservation of the land are allowed under this category. The Flagler County portion of the property is zoned as Agriculture with a maximum building density of one dwelling per five acres. The zoning designation for the Volusia County portion is Resource Corridor with a maximum allowable density of one dwelling unit per 25 acres. Typical park uses and facilities are permissible within the future land use and zoning categories. No conflicts to park development and management are anticipated.

Current Recreational Use and Visitor Programs

Most of the recreational use in the preserve occurs on the creeks and the logging canals. Boating, canoeing/kayaking, and fishing are the primary recreational activities on these remote waterways. During peak seasons, numerous fishermen use the creeks and adjacent lakes. The park, a designated stop on the Great Florida Birding Trail, offers excellent opportunities for viewing wildlife in a natural setting. Due to the low elevation of the majority of the preserve there is very little land-based recreation potential.

Haw Creek Preserve State Park recorded 5,460 visitors in FY 2014/2015. By DRP estimates, the FY 2014/2015 visitors contributed \$461,535 in direct economic impact, the equivalent of adding 7 jobs to the local economy (FDEP 2015).

Protected Zones

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

At Haw Creek Preserve State Park all wetlands and floodplain as well as known imperiled species habitat have been designated as protected zones. The park's current protected zone is delineated on the Conceptual Land Use Plan.

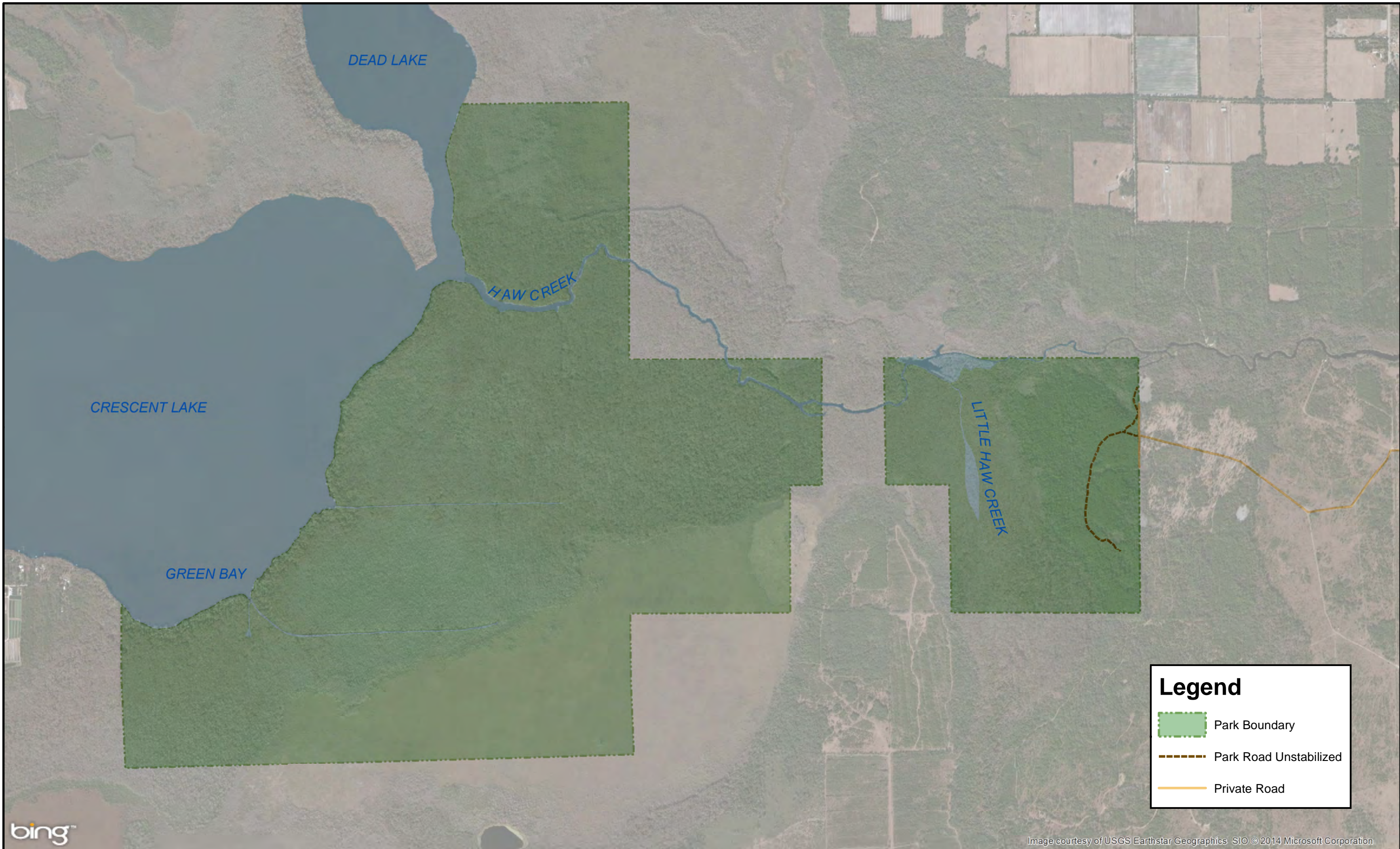
Existing Facilities

At this time, there are no facilities or developed use areas in the preserve. Primary access to the park is from day use area and boat ramp at Russell Landing in Haw Creek Preserve.

Conceptual Land Use Plan

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




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



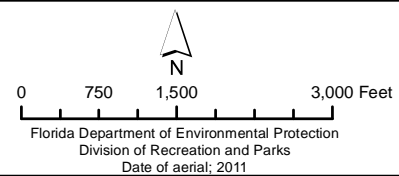
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Image courtesy of USGS Earthstar Geographics SIO © 2014 Microsoft Corporation

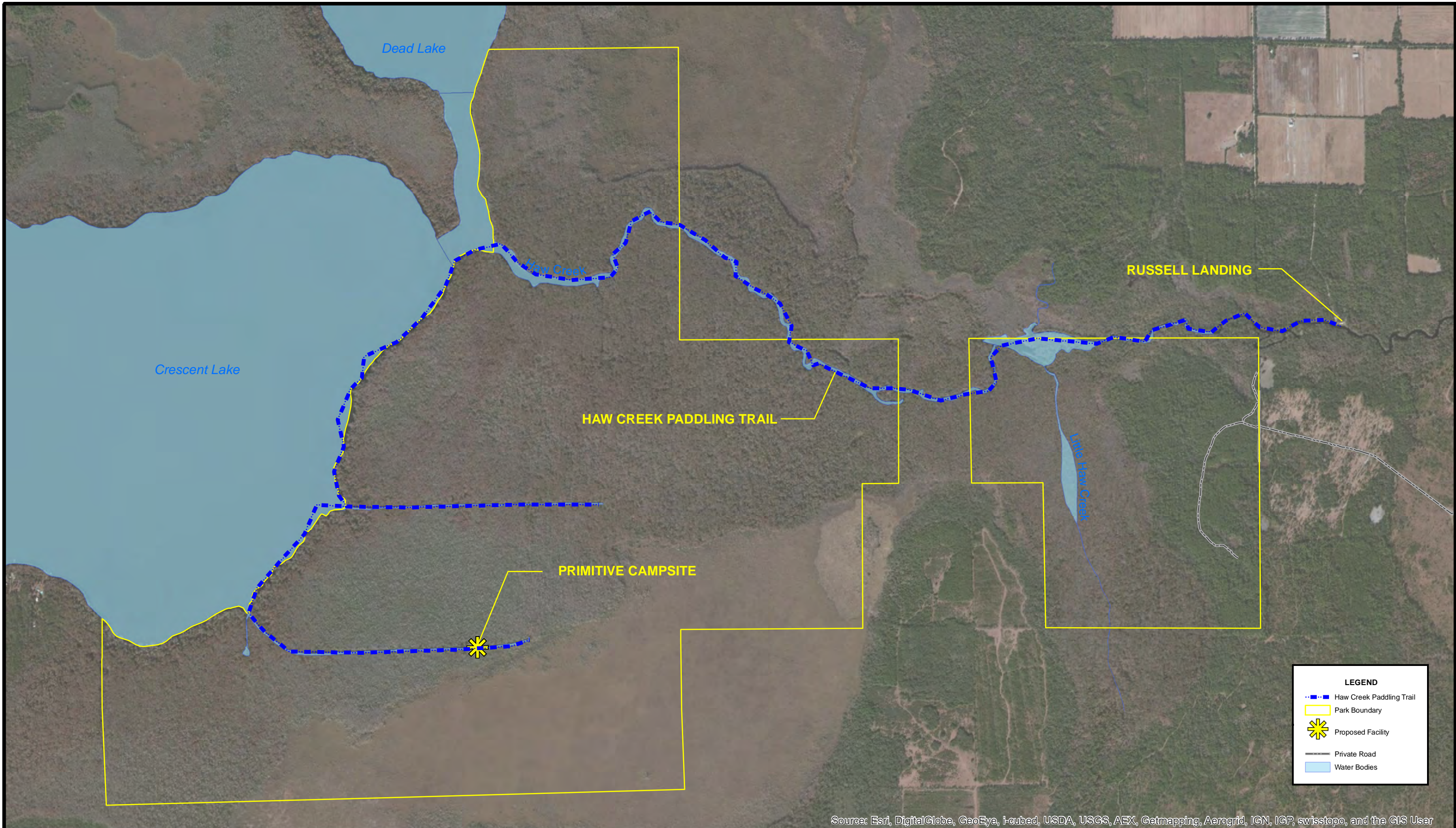
Legend

-  Park Boundary
-  Park Road Unstabilized
-  Private Road

HAW CREEK PRESERVE STATE PARK



BASE MAP



development. This includes the design of all new park facilities consistent with the universal access requirements of the Americans with Disabilities Act (ADA). After new facilities are constructed, park staff monitors conditions to ensure that impacts remain within acceptable levels

Potential Uses

Public Access and Recreational Opportunities

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

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

Objective: Maintain the park's current recreational carrying capacity of 212 users per day.

As a preserve, the primary emphasis is placed on protection of the resources of the site. Potential recreational uses should be primarily low-impact, and must be compatible with resource preservation objectives. The existing low-level boating and fishing activities in the preserve are appropriate and should continue.

Objective: Expand the park's recreational carrying capacity by 8 users per day.

There is limited potential to expand recreational opportunities in the uplands located in the easternmost part of the preserve due to the remote location and lack of public access. Until access can be established, no new activities or facilities are recommended. The expansion of recreational opportunities for this planning period will be aimed at enhancing the paddling experience on Haw Creek. With its linkage to the St. Johns River via Crescent Lake and Dunn's Creek, it is expected that this beautiful, blackwater stream will become increasingly popular with area paddlers.

A quality Haw Creek paddling trail experience will require a partnership between Flagler County, SJRWMD and the DRP. Access to the creek is currently provided by Flagler County at their Russell Landing park. The boat ramp and day use facilities at this location offer the essential elements of a good paddling trailhead including a boat ramp, parking, picnic facilities, restroom and boardwalk. Approximately 8 miles of blackwater stream, lake shoreline, and logging canals exist with the state park. To enhance the paddling trail experience, the DRP will provide an appealing destination by providing a primitive camping opportunity on one of the logging canals that intersect Crescent Lake. The canals, each approximately one mile long, penetrate a dense floodplain forest and will provide paddlers with access to a unique and

remote camping experience. The DRP will work with Flagler County and the SJRWMD to promote the Haw Creek paddling trail. If feasible, the DRP will collaborate with these agencies to provide additional facilities such as a canoe/kayak launch, an information kiosk, wayfinding signage, and interpretive materials to further enhance the paddling trail experience. Additional primitive campsites for paddlers may be considered in the future depending on the popularity of the proposed facility.

Objective: Continue to provide the current repertoire of 1 interpretive, educational and recreational programs on a regular basis.

A ranger-guided walk is offered on the Russell Landing boardwalk by request. Various aspects of Haw Creek natural and cultural history are interpreted during this presentation.

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

A ranger-guided paddling trip will be offered on Haw Creek by request. Participants will paddle downstream and back from Russell Landing to learn about the natural and cultural history of the blackwater stream and surrounding floodplain forest.

Proposed Facilities

Capital Facilities and Infrastructure

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

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

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

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

Objective: Construct 1 new facility.

One primitive campsite will be established along one of the old logging canals on Crescent Lake. The site should be established with enough distance from the lake to be inaccessible to power boats and to provide a remote experience. A raised camping

platform will be provided. The platform should accommodate up to 8 campers. Depending on the use and popularity of the campsite an additional primitive campsite may be provided on the other logging canal in the future.

Facilities Development

Preliminary cost estimates for these recommended facilities and improvements are provided in the Ten-Year Implementation Schedule and Cost Estimates (Table 7) located in the Implementation Component of this plan. These cost estimates are based on the most cost-effective construction standards available at this time. The preliminary estimates are provided to assist DRP in budgeting future park improvements, and may be revised as more information is collected through the planning and design processes. New facilities and improvements to existing facilities recommended by the plan include:

Primitive Campsite

Raised sleeping platform (up to 8 campers)

Recreational Carrying Capacity

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

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

Table 6. Recreational Carrying Capacity						
	Existing Capacity*		Proposed Additional Capacity		Estimated Recreational Capacity	
	One Time	Daily	One Time	Daily	One Time	Daily
Primitive Camping			8	8	8	8
Boating	36	72			36	72
Canoeing/Kayaking	70	140			70	140
TOTAL	106	212	8	8	114	220

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

Optimum Boundary



The optimum boundary map reflects lands considered desirable for direct management by the DRP as part of the state park. These parcels may include public or privately owned land that would improve the continuity of existing parklands, provide the most efficient boundary configuration, improve access to the park, provide additional natural and cultural resource protection or allow for future expansion of recreational activities. Parklands that are potentially surplus to the management needs of DRP are also identified. As additional needs are identified through park use, development, and research, and as land use changes on adjacent property, modification of the park’s optimum boundary may be necessary.

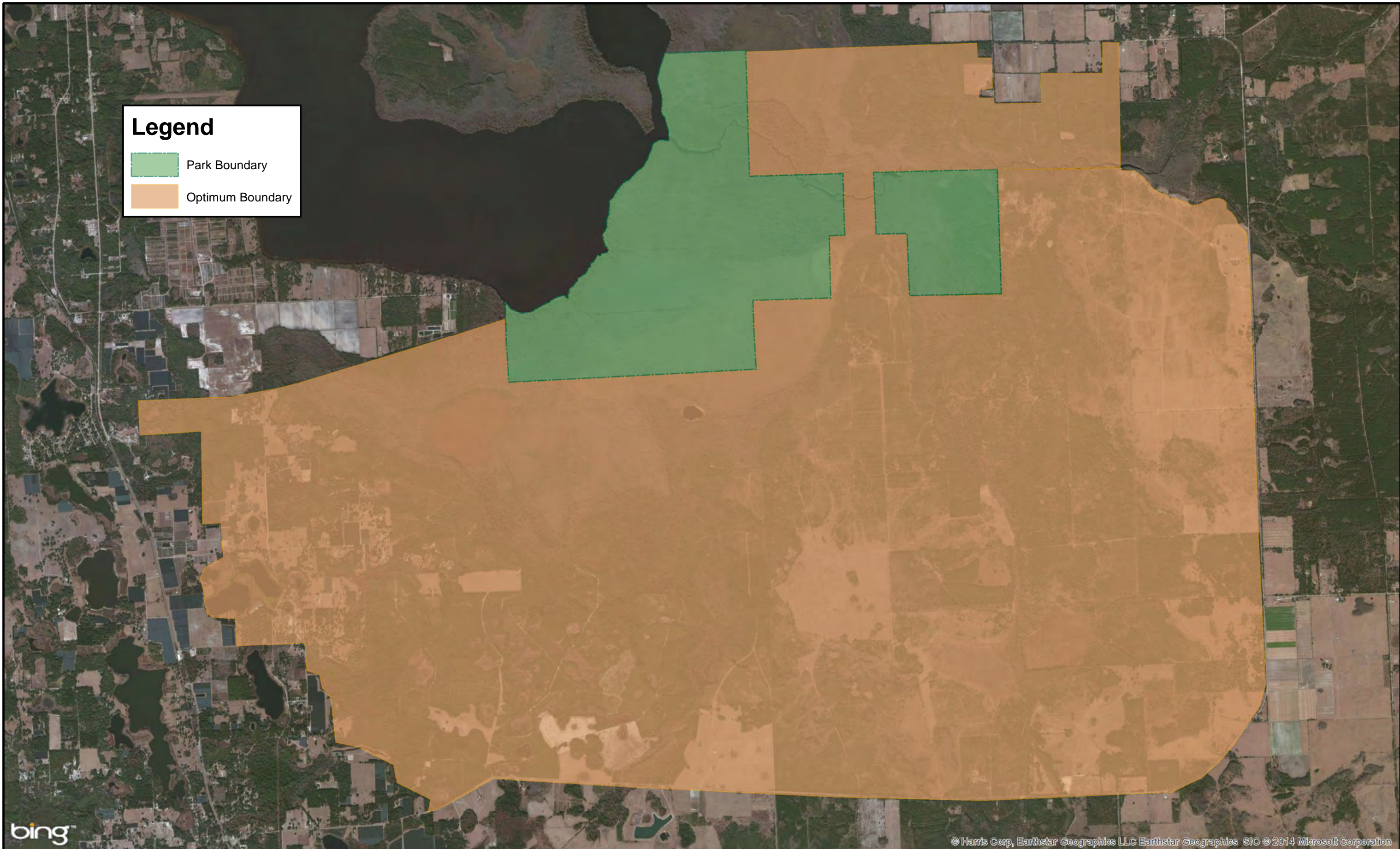
Identification of parcels on the optimum boundary map is intended solely for planning purposes. It is not to be used in connection with any regulatory purposes. Any party or governmental entity should not use a property’s identification on the optimum boundary map to reduce or restrict the lawful rights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

The optimum boundary map reflects lands identified for direct management by the Division as part of the park. These parcels may include public as well as privately owned lands that improve the continuity of existing park lands, provide additional natural and cultural resource protection, and/or allow for future expansion of recreational activities. Over 22,000 acres have been identified for potential acquisition for the purposes of protecting Haw Creek,

Little Haw Creek and associated uplands, and to provide suitable upland access for recreational development and resource management. The Division will be working with the St. Johns River Water Management District and Flagler County to refine this boundary and create an acquisition project for these purposes.

Legend

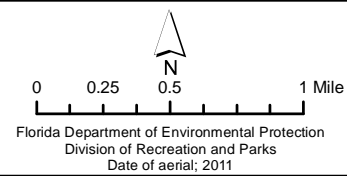
-  Park Boundary
-  Optimum Boundary



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HAW CREEK PRESERVE STATE PARK



OPTIMUM BOUNDARY MAP

IMPLEMENTATION COMPONENT

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

Management Progress

Since the approval of the last management plan for Haw Creek Preserve State Park in 2003, significant work has been accomplished and progress made towards meeting the DRP's management objectives for the park. These accomplishments fall within three of the five general categories that encompass the mission of the park and the DRP.

Park Administration and Operations

- Removed illegal tree/hunting stands on property boundary.
- Negotiated an agreement with adjacent property owner to allow access to eastern parcel.

Resource Management

Natural Resources

- Treated 400 acres of invasive exotics.
- Collected plants for vouchered plant list.
- Surveyed for imperiled *Tillandsia utriculata*.
- Conducted prescribed burn along the Cowart property boundary.
- Assessed fuel loading and timber condition in mesic flatwoods.
- Conducted a timber sales assessment.

Cultural Resources

- Photographed/documentated Herty cups in park pinelands.
- Listed three archaeological sites in the FMSF.

Recreation and Visitor Services

- Installed sign listing recreational opportunities available in the park at Russell Landing.

Park Facilities

- Installed park entrance sign at Russell Landing.
- Installed park boundary signs.

Management Plan Implementation

This management plan is written for a timeframe of ten years, as required by Section 253.034 Florida Statutes. The Ten-Year Implementation Schedule and Cost Estimates (Table 7) summarizes the management goals, objectives and actions that are recommended for implementation over this period, and beyond. Measures are identified for assessing progress toward completing each objective and action. A time frame for completing each objective and action is provided. Preliminary cost estimates for each action are provided and the estimated total costs to complete each objective are computed. Finally, all costs are consolidated under the following five standard land management categories: Resource Management, Administration and Support, Capital Improvements, Recreation Visitor Services and Law Enforcement.

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

Statewide priorities for all aspects of land management are evaluated each year as part of the process for developing the DRP's annual legislative budget requests. When preparing these annual requests, the DRP considers the needs and priorities of the entire state park system and the projected availability of funding from all sources during the upcoming fiscal year. In addition to annual legislative appropriations, the DRP pursues supplemental sources of funds and staff resources wherever possible, including grants, volunteers and partnerships with other entities. The DRP's ability to accomplish the specific actions identified in the plan will be determined largely by the availability of funds and staff for these purposes, which may vary from year to year. Consequently, the target schedules and estimated costs identified in Table 7 may need to be adjusted during the ten-year management planning cycle.

NOTE: THE DIVISION'S ABILITY TO COMPLETE THE OBJECTIVES OUTLINED BY THE MANAGEMENT PLAN IS CONTINGENT ON THE AVAILABILITY OF FUNDING AND OTHER RESOURCES FOR THESE PURPOSES.				
Goal I: Provide administrative support for all park functions.				
		Measure	Planning Period	Estimated Manpower and Expense Cost* (10-years)
Objective A	Continue day-to-day administrative support at current levels.	Administrative support ongoing	C	\$2,000
Objective B	Expand administrative support as new lands are acquired, new facilities are developed, or as other needs arise.	Administrative support expanded	C	\$1,000
Goal II: Protect water quality and quantity in the park, restore hydrology to the extent feasible, and maintain the restored condition.				
		Measure	Planning Period	Estimated Manpower and Expense Cost* (10-years)
Objective A	Conduct/obtain an assessment of the park's hydrological needs.	Assessment conducted	LT	\$20,000
Action 1	Assess hydrological restoration needs	Assessment conducted	LT	\$20,000
Objective B	Identify sources of point source pollution	Sources identified	UFN	\$5,000
Action 1	Collect and assess surface water data	Data collected	UFN	\$5,000
Goal III: Restore and maintain the natural communities/habitats of the park.				
		Measure	Planning Period	Estimated Manpower and Expense Cost* (10-years)
Objective A	Within 10 years have 87 acres of the park maintained within optimal fire return interval.	# Acres within fire return interval target	LT	\$45,000
Action 1	Develop/update annual burn plan.	Plan updated	C	\$5,000
Action 2	Manage fire dependent communities for ecosystem function, structure and processes by burning between 87 - 385 acres annually, as identified by the annual burn plan.	Average # acres burned annually	C	\$15,000
Action 3	Establish 1.2 miles of new fire breaks	# Miles established	UFN	\$25,000
Objective B	Conduct habitat/natural community restoration activities on 65.5 acres of mesic flatwoods and 3 acres of depression marsh community.	# Acres restored or with restoration underway	UFN	\$73,000
Action 1	Develop site specific restoration plan	Plan developed	ST	\$50,000
Action 2	Conduct timber harvest for the purposes of the restoration project on 65.5 acres.	Timber harvest conducted	LT	\$8,000
Action 3	Apply prescribed fire.	Prescribe fire applied	C	\$15,000
Goal IV: Maintain, improve or restore imperiled species populations and habitats in the park.				
		Measure	Planning Period	Estimated Manpower and Expense Cost* (10-years)
Objective A	Update baseline imperiled species occurrence inventory lists for plants and animals, as needed.	List updated	C	\$50,000
Objective B	Monitor and document 1 selected imperiled plant species in the park.	# Species monitored	C	\$6,000
Action 1	Develop monitoring protocols for 1 selected imperiled plant species including giant air plant.	# Protocols developed	ST	\$1,000
Action 2	Implement monitoring protocols for 1 imperiled plant species including those listed in Action 1 above.	# Species monitored	C	\$5,000
Goal V: Remove exotic and invasive plants and animals from the park and conduct needed maintenance-control.				
		Measure	Planning Period	Estimated Manpower and Expense Cost* (10-years)
Objective A	Annually treat 5 acres of exotic plant species in the park.	# Acres treated	C	\$10,000
Action 1	Annually develop/update exotic plant management work plan.	Plan developed/updated	C	\$1,000

* 2015 Dollars
ST = actions within 2 years
LT = actions within 10 years
C = long term or short term actions that are continuous or cyclical
UFN = currently unfunded need

NOTE: THE DIVISION'S ABILITY TO COMPLETE THE OBJECTIVES OUTLINED BY THE MANAGEMENT PLAN IS CONTINGENT ON THE AVAILABILITY OF FUNDING AND OTHER RESOURCES FOR THESE PURPOSES.				
Action 2	Implement annual work plan by treating 5 acres in park, annually, and continuing maintenance and follow-up treatments, as needed.	Plan implemented	C	\$9,000
Objective B	Implement control measures on 2 exotic and nuisance animal species in the park.	# Species for which control measures implemented	C	\$15,000
Objective C	Control livestock encroachment	Encroachment controlled	UFN	\$40,000
Action 1	Install boundary fencing	Fencing installed	UFN	\$40,000
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 3 of 3 recorded cultural resources in the park.	Documentation complete	UFN	\$3,000
Action 1	Complete 3 assessments/evaluations of archaeological sites. Prioritize preservation and stabilization projects.	Assessments complete	UFN	\$3,000
Objective B	Compile reliable documentation for all recorded historic and archaeological sites.	Documentation complete	LT	\$1,000
Action 1	Ensure all known sites are recorded or updated in the Florida Master Site File.	# Sites recorded or updated	ST	\$1,000
Action 2	Conduct Level 1 archaeological survey for 1 priority areas identified by archaeological predictive model.	Survey completed	UFN	\$3,000
Objective C	Bring 1 of 3 recorded resources into good condition	# Sites in good condition	UFN	\$2,000
Action 1	Implement a regular monitoring program for 1 cultural resource	# Sites monitored	C	\$2,000
Goal VII: Provide public access and recreational opportunities in the park.				
		Measure	Planning Period	Estimated Manpower and Expense Cost* (10-years)
Objective A	Maintain the park's current recreational carrying capacity of 212 users per day.	# Recreation/visitor	C	\$6,000
Objective B	Expand the park's recreational carrying capacity by 8 users per day.	# Recreation/visitor	UFN	\$1,000
Objective C	Continue to provide the current repertoire of 1 interpretive, educational and recreational programs on a regular basis.	# Interpretive/education programs	C	\$3,000
Objective D	Develop 1 new interpretive, educational and recreational programs.	# Interpretive/education programs	UFN	\$5,000
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	\$2,000
Objective B	Continue to implement the park's transition plan to ensure facilities are accessible in accordance with the American with Disabilities Act of 1990.	Plan implemented	LT	\$10,000
Objective D	Construct 1 new facility	# Facilities/Miles of Trail/Miles of Road	LT	\$55,000
Objective E	Expand maintenance activities as existing facilities are improved and new facilities are developed.	Facilities maintained	C	\$5,000

* 2015 Dollars
ST = actions within 2 years
LT = actions within 10 years
C = long term or short term actions that are continuous or cyclical
UFN = currently unfunded need

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

Summary of Estimated Costs

Management Categories	Total Estimated Manpower and Expense Cost* (10-years)
Resource Management	\$270,000
Administration and Support	\$3,000
Capital Improvements	\$65,000
Recreation Visitor Services	\$22,000
Law Enforcement Activities ¹	
	1Law enforcement activities in Florida State Parks are conducted by the FWC Division of Law Enforcement and by local law enforcement agencies.

* 2015 Dollars
ST = actions within 2 years
LT = actions within 10 years
C = long term or short term actions that are continuous or cyclical
UFN = currently unfunded need

Addendum 1—Acquisition History

Haw Creek Preserve State Park Acquisition History

Purpose of Acquisition:

The Board of Trustees of the Internal Improvement Trust Fund of the State of Florida (Trustees) acquired Haw Creek Preserve State Park to preserve, maintain, and enhance the integrity and character of the ecosystem of the property for use as wildlife and waterfowl area and for compatible non-consumptive recreational use and nature appreciation.

Sequence of Acquisition:

On December 2, 1976, the Trustees obtained title to a 2,822.46-acre property, located in Volusia County, Florida, which later became Haw Creek Preserve State Park. The Trustees acquired the property as a donation from The Nature Conservancy. On July 18, 1978, the Trustees acquired another approximately 239-acre property and added it to Haw Creek Preserve State Park. Presently the preserve comprises approximately 3,061 acres.

Title Interest:

The Trustees holds fee simple title to Haw Creek Preserve State Park.

Lease Agreement:

On August 15, 1977, the Trustees leased Haw Creek Preserve State Park to the State of Florida Department of Natural Resources, predecessor in interest to the State of Florida Department of Environmental Protection, for the use and benefit of the Division of Recreation and Parks (DRP) under a ninety-nine (99) year term lease, Lease No. 2991. This lease expires on August 14, 2076.

According to Lease No. 2991, DRP manages Haw Creek Preserve State Park to provide for environmental protection and enhancement, park and recreation management, and related purposes.

Special Conditions on Use:

Haw Creek Preserve State Park is designated as a single-use property to provide resource-based public outdoor recreation and other park related uses. Uses such as water resource development projects, water supply projects, storm-water management projects, and linear facilities and sustainable agriculture and forestry are not consistent with the primary purpose for which DRP manages the park.

Haw Creek Preserve State Park Acquisition History

Outstanding Reservations:

Following is a deed encumbrance that applies to Haw Creek Preserve State Park:

Type of Instrument:	Indenture
Grantor:	The Nature Conservancy
Grantee:	Trustees
Beginning Date:	December 2, 1976
Ending Date:	Perpetuity
Outstanding encumbrance:	The indenture (deed) places two major restrictions (encumbrances) on the use of the subject property: (1) The Trustees can use the subject property only for the preservation, maintenance and enhancement of the integrity and character of the ecosystem of the property, and (2) the Trustees shall erect and maintain a permanent plaque or other appropriate marker at a prominent location on the subject property bearing the following statement: "This area was acquired with the assistance of the Nature Conservancy."

Addendum 2—Advisory Group Members and Report

**Haw Creek Preserve State Park
Advisory Group Members and Report**

Local Government Officials

The Honorable Jason Davis, Chair
Volusia County Council

The Honorable Nate McLaughlin, Vice
Chair
Flagler County Commission

Agency Representatives

Philip Rand, Manager
Haw Creek Preserve State Park

Cindy Bennett, Biologist
Florida Fish and Wildlife Conservation
Commission

Peter Kouracos, Chair
Volusia County Soil and Water
Conservation District

Michael Edwards
Other Public Lands Forester,
Region 4, Florida Forest Service

Tourist Development Council

Matt Dunn, Manager
Flagler County Tourist Development
Council

Sharon Angelastri, Manager
Volusia County Tourist Development
Council

Environmental Representatives

Walter Mahler
Flagler Audubon Society

Paul Rebmann
Florida Native Plant Society,
Pawpaw Chapter

User Groups

Gus Bianchi, Regional Director
First Coast Area, Florida Paddling
Trails Association

Darrell Van Vactor, Operations
Manager
Crappie USA

Citizen Support Organization

James Friske, President
Friends of Tomoka Basin GeoPark, Inc.

Adjacent Landowner

Charles Cowart

Haw Creek Preserve State Park Advisory Group Members and Report

The Advisory Group meeting for Haw Creek Preserve State Park was held at the Tomoka State Park recreation hall on June 16, 2016. Stuart Jones represented Jason Davis and Tim Telfer represented Nate McLaughlin. Cindy Bennett, Darrell Van Vactor, Sharon Angelastri, Charles Cowart, and Matt Dunn were unable to attend. All other Advisory Group members were in attendance. Attending staff were Robert Yero, Alice Bard, Philip Rand, Joe Isaacs, and David Copps.

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

Summary of Advisory Group Comments

Paul Rebmann (Florida Native Plant Society, Paw Paw Chapter) stated that he was encouraged by the comprehensive nature of the plan and was pleased with the discussion of exotic invasive plant management, monitoring of the giant air plant, and pine thinning. He said that he would like to see access to the uplands and trail development addressed in the plan. Mr. Rebmann said that he is looking forward to using the paddle-in primitive campsite once it is developed.

James Fiske (Friends of Tomoka Basin, GeoPark, Inc.) asked about the source of revenue for the management of the Tomoka Basin parks. Mr. Yero replied that management money for all state parks comes from one big pot of money. He stated that the funds generated by each park in the system go into a general operating fund and are allocated each year based on a system-wide prioritization of needs. Mr. Fiske stated that he is concerned about the lack of access to the park and the fact that the park boundaries are not fully understood. Mr. Rand replied that all of the boundaries are known but not all of the boundaries are fenced. Mr. Fiske asked if the park is responsible for fencing the entire boundary. Mr. Rand said that not all of the boundary is fenced and only those areas with greatest need will be fenced. Mr. Fiske asked if hog removal services are funded through the general operating fund. Mr. Rand said that the park experiences only minor hog damage and that the hog removal contractors don't charge for the service. He also said the adjacent cattle rancher has agreed to install hog traps on his property which will benefit the park. Mr. Rand said that park staff regularly monitor the property but they see little in the way of human, cattle, and hog intrusions. Mr. Fiske said that the park is the probable location for Seminole encampments during the Second Seminole War. He stated the significance of such a finding and recommended that an archaeological survey be conducted to find out if these encampment sites exist on the property. Ms. Bard described the archaeological predictive model that was developed for the park. She said that it divides the park into low, medium, and high probability zones for archaeological sites and helps the park to determine where to conduct archaeological surveys. Mr. Fiske stated that primitive campsite may attract poachers and asked how the park would patrol and monitor the site. Mr. Rand said the he would work with FWC to patrol the site. Mr. Yero said that a visitor presence at the campsite would actually be a deterrent to poaching activities. Mr. Fiske said

Haw Creek Preserve State Park Advisory Group Members and Report

that he is in favor of the campsite but wants the park to keep it monitored and clean. Mr. Rand said that he would like to recruit volunteers from paddling organizations to help out.

Peter Kouracos (Volusia Soil and Water Conservation District) complimented the plan's discussion of exotic invasive plant management. He said that he has generally observed that state parks forests do a good job of controlling exotics but pointed out the problem of constant re-infestation from sources on adjacent private properties. He asked if Volusia Soil and Water Conservation District (VSWCD) board and staff could come to a park and learn how exotic invasive plants are controlled on state parks. Mr. Yero said that such a visit could be arranged. Mr. Kouracos said the VSWCD may want to apply for funding to teach private landowners how to control on their properties. Mr. Rand stated that the Tomoka parks have consistently received funding from the Division of Recreation and Parks to control exotics due to effectiveness of treatment efforts in the parks. Mr. Fiske asked if CSO members could also be trained in exotic invasive plant control. Mr. Yero said that would be possible.

Walt Mahler (Flagler Audubon) said that Flagler Audubon sponsored a paddling trip on Haw Creek. He stated that the primitive campsite is a good idea but will be expensive to build and maintain. He suggested that the state should partner with Flagler County to make improvements to Russell Landing Park. Mr. Yero said that the only facility at the proposed campsite will be a small, raised deck to accommodate tent campers. He said that the park may be able to partner with an Eagle Scout to implement this project. Mr. Rand encouraged Audubon volunteers to help conduct bird surveys in the park. He said that this type of inventory work helps to guide park planning and management.

Tim Telfer (Flagler County) stated that Flagler County is willing to partner with the state to implement management measures for the benefit of both parks (Haw Creek Preserve and Haw Creek Preserve State Park). He provided examples where the two agencies could collaborate including invasive exotic plant control, feral hog control, timbering, and prescribed burning. He said that the Central Florida Prescribed Fire Working Group is a good resource for burn assistance and that Flagler County, as part of that organization, may be able to assist the park on burn projects. Mr. Telfer said that Flagler County is willing to explore the feasibility of constructing an elevated walkway over Haw Creek to provide access to the state park from the county park.

Michael Edwards (Florida Forest Service) referred to the timber assessment in the management plan and recommended timber thinning to achieve an 80 square foot basal area. He said that this operation could generate a small amount of revenue. Mr. Edwards said the FFS has a cost sharing program to help private landowners control cogon grass. He recommended that the park work with the local multi-agency partnership CISMA to obtain funding and manpower for exotic invasive plant control projects. Ms. Bard said that FPS District 3 has worked through the local CISMA to obtain FWC funding for some exotic removal projects with Tomoka Basin.

Haw Creek Preserve State Park Advisory Group Members and Report

Mr. Edwards recommended that the park seek assistance from the FFS for help with prescribed burning through its Mitigation Team and Prescribed Fire Systems Team.

Gus Bianchi (Florida Paddling Trails Association) said the he appreciates the addition of the paddling trail and campsite. He said that these facilities will be used by paddlers once word gets out. Mr. Bianchi stated that he would like to see a separate kayak launching area at Russell Landing and said that a simple approach is best. Mr. Telfer said that paddling groups should ask Flagler County for assistance to improve the boat landing or provide a kayak launch. He said that there may be some funding for such a project from revenues generated by timbering operations on Flagler County's Haw Creek Preserve. Mr. Rand asked if it would be possible to install a kayak launch at Bull Creek Campground. Mr. Telfer said that it would be harder to do at that location. Mr. Bianchi said that Liz Sparks in the DRP Office of Greenways and Trails could provide kayak launch design recommendations. Mr. Bianchi recommended that the campsite platform be designed to accommodate the needs of paddlers and that the issue of human waste disposal should be carefully considered. He also recommended that the park partner with local schools, particularly their special education programs, for help with exotic invasive plant control projects. Mr. Bianchi asked if the campsite will be on a reservation system. Mr. Yero said yes – a call in or email system will be used.

Philip Rand (Florida Park Service) said that there may be opportunities to develop additional paddle-in campsites on Little Haw Creek and in the easternmost parcel just west of Russell Landing. More exploration is needed to make that determination.

Stuart Jones (Volusia County) said that the plan seems reasonable and not overly ambitious. He said that the park should call on its partners for assistance and that Volusia County will help out on prescribed burning if possible.

Summary of Written Comments

Cindy Bennett (Florida Fish and Wildlife Conservation Commission) commended staff for putting priority to gaining a right-of-way easement to zone HC1 as most management objectives may not be met without this first being accomplished. She stated that the Plants List of Addendum 5 is very impressive, however, sections of the Animal List of this addendum seem to be lacking. If this list was composed solely on observations, then we should expect that it too will be expanded upon with the ROW easement to HC1.

Staff Recommendations

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

- Language will be added on page 56 to include a canoe/kayak launch to the list of facilities that will be considered for enhancing the Haw Creek paddling

Haw Creek Preserve State Park Advisory Group Members and Report

trail experience in collaboration with Flagler County and the St. Johns Water Management District.

With this modification, DRP staff recommends approval of the proposed management plan for Haw Creek Preserve State Park.

Notes on Composition of the Advisory Group

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

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

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

**Haw Creek Preserve State Park
Advisory Group Members and Report**

Addendum 3—References Cited

Haw Creek Preserve State Park References Cited

- Baldwin, R., C. Bush, R. Hinton, H. Huckle, P. Nichols, F. Watts, and J. Wolfe. 1980. Soil survey of Volusia County, Florida. U.S. Dept. of Agriculture, Soil Conservation Service in cooperation with Univ. of Florida Agricultural Experiment Stations.
- Blanchard, J., S. Jue, and A. Crook. 1998. Florida conservation lands 1998. Florida Natural Areas Inventory, Tallahassee, Florida.
- Brooks, H. K. 1981a. Physiographic regions. Florida Cooperative Extension Service, I.F.A.S., Univ. of Florida, Gainesville, Florida.
- Brooks, H. K. 1981b. Geologic map of Florida. Florida Cooperative Extension Service I.F.A.S., Univ. of Florida, Gainesville, Florida.
- Bureau of Economic and Business Research (BEBR), 2014, University of Florida: <http://www.bibr.ufl.edu/data>).
- Cardwell, H.D. 1999. America: the famous yacht. Halifax Historical Society, Vol. 17 No 2., Daytona Beach, Florida.
- Collins, L.D, T. Doering, and S. Fernandez. 2010. Archaeological Resource Sensitivity Modeling in Florida State Parks District 3: the East and Central Florida Region. University of South Florida. October 2010.
- Cox, J., R. Kautz, M. MacLaughlin, and T. Gilbert. 1994. Closing the gaps in Florida's wildlife habitat conservation system. Office of Environmental Services, Florida Fish and Wildlife Conservation Commission, Tallahassee, Florida. 231 pp.
- Division of Recreation and Parks. 1997. Standard resource management procedures. Manual on file. Florida Department of Environmental Protection, Tallahassee, Florida.
- Flagler County. 2010. Flagler County Comprehensive Plan 2010-20135. Future Land Use Element. Flagler County, Florida.
- Flagler County. 2014. Flagler County Code of Ordinances. Zoning District Regulations. Flagler County, Florida
- Florida Department of Environmental Protection. 1998. Haw Creek State Preserve unit plan. Report on file. Tallahassee, Florida.
- Florida Department of Environmental Protection. 2013. Florida State Park System Economic Impact Assessment for Fiscal Year 2012/2013. Tallahassee, Florida.
- Florida Department of State. Florida Master Site Files. Tallahassee, Florida.

Haw Creek Preserve State Park References Cited

- Florida Exotic Pest Plant Council (FEPPC). Florida EPPC's 2011 Invasive Plant Species List. <http://www.fleppc.org/list/list.htm> 2011.
- Florida Fish and Wildlife Conservation Commission. 1999. Fish and Wildlife Research Institute. Wading Bird Rookeries GIS Data. http://ocean.floridamarine.org/TRGIS/Description_Layers_Terrestrial.htm. Florida Natural Areas Inventory (FNAI). 2010. Guide to the Natural Communities of Florida: 2010 edition. Florida Natural Areas Inventory, Tallahassee, FL.
- Gannon, M. 1996. The new history of Florida. University Press of Florida, Gainesville Florida. 480pp.
- Hand, J., J. Col, and L. Lord. 1996. Northeast Florida Water Quality 1996 305(b) Technical Appendix in 1996 Water-Quality Assessment for the State of Florida Section 305(b) Main Report (M. Paulic, J. Hand, and L. Lord). Florida Department of Environmental Protection, Tallahassee, Florida.
- Marois, K. 1999. June 1999 tracking list of rare, threatened, and endangered plants and animals and natural communities of Florida. Florida Natural Areas Inventory. Tallahassee, Florida.
- Meyer, K.D., and M.W. Collopy. 1995. Status, distribution, and habitat requirements of the American swallow-tailed kite (*Elanoides forficatus*) in Florida. Nongame Wildlife Program project GFC-87-025. Florida Game and Fresh Water Fish Commission, Tallahassee, Florida.
- Milanich, J.T. and C.H. Fairbanks. 1980. Florida archaeology. Academic Press, Inc. New York, New York. 290pp.
- Readle, E.L., R. Baldwin, K. Goerg, and J. Leppo. 1997. Soil survey of Flagler County, Florida. U.S. Dept. of Agriculture, Natural Resources Conservation Service in cooperation with Univ. of Florida, I.F.A.S., and Florida Department of Agriculture and Consumer Services.
- Rumenik, R.P., and J.W. Grubbs. 1996. Low-flow characteristics of Florida streams. U.S. Geological Survey, Water-Resources Investigations Report 93-4165. Tallahassee, Florida.
- Scott, T. 1992. Geologic map of Flagler County, Florida. P.G.# 99, Florida Geological Survey, Florida Department of Natural Resources.
- St. Johns River Water Management District (SJRWMD) Watershed Facts: Haw Creek. <http://www.sjrwmd.com/watershedfacts/factPages/HAW.html>
- Smithsonian Marine Station at Fort Pierce. 2011. Indian River Lagoon Species Inventory. <http://www.sms.si.edu/irlspec/index.htm>.

Haw Creek Preserve State Park References Cited

- U.S. Census Bureau. 2012. *State and County QuickFacts*.
<http://quickfacts.census.gov/qfd/index.html>, 2013.
- U.S. Census Bureau. 2010. Tiger Tracts
- U.S. Department of Agriculture Soil Conservation Service (USDASCS). 1988. *Soil Taxonomy: A Basic System of Soil Classification for Making and Interpreting Soil Surveys*. Robert E. Krieger Publishing Company: Malabar, FL. p. 187.
- Vergara, P.G. (ed.). 1998. Water supply assessment, 1998. Technical publication SJ98-2. St. Johns River Water Management District, Palatka, Florida.
- Visit Florida! 2011. *2011 Florida Visitor Study*. 154 pp. Tallahassee, Florida.
- Volusia County. 2014a. Volusia County Comprehensive Plan. Future Land Use Element. Volusia County, Florida.
- Volusia County. 2014b. Growth and Resource Management. Building and Zoning. Zoning Classification Summary Sheet.
www.volusia.org/gis/data/zoncodes.htm

Haw Creek Preserve State Park References Cited

Addendum 4—Soil Descriptions

Haw Creek Preserve State Park Soil Descriptions

(6) Favoretta Clay - This is a nearly level, poorly drained clay soil found in flatwoods near streams and floodplains. The surface layer, about 12 inches thick, is very dark gray clay. The subsoil contains clay to a depth of 80 inches or more. The seasonal high water table is within a depth of 12 inches for 4 to 6 months during most years. Permeability is very slow and the organic content is low.

(7) Favoretta, Chobee, and Winder soils, frequently flooded - This map unit consists of nearly level, poorly drained and very poorly drained soils in drainageways and on floodplains along major streams on the flatwoods. This composite unit consists of several series, including Favoretta clay soils, and sandy-loamy Winder soils and Chobee soils. In most years, areas of this map unit are flooded for 1 month or more during periods of high rainfall. The seasonal high water table is at a depth of 0 to 6 inches for 6 months or more. These soils are often associated with Floodplain Swamp

(10) Winder fine soil – This is a nearly level, poorly drained soil. It occurs in broad, low flats with slopes less than 2 percent. Typically, the surface layer is dark gray fine sand about 7 inches thick overlying a loamy subsoil. The water table is within a depth of 6 inches for 2 to 6 months. Permeability is slow or very slow.

(41, 65) Terra Ceia muck – This is a very deep, very poorly drained, nearly level soil on broad or narrow floodplains along Haw Creek and Crescent Lake. The surface is more than 80 inches thick consisting of brown and black muck. The water table is as much as 2 feet above the surface at times during the rainy season. Terra Ceia muck soils are associated with Floodplain Swamp and Basin Marsh.

**Haw Creek Preserve State Park
Soil Descriptions**

Addendum 5—Plant and Animal List

Haw Creek Preserve State Park Plants

Common Name	Scientific Name	Primary Habitat Codes (for imperiled species)
Alabama supplejack	<i>Berchemia scandens</i>	
Alligator-weed *	<i>Alternanthera philoxeroides</i>	
American beautyberry	<i>Callicarpa americana</i>	
American elm	<i>Ulmus americana</i>	
American hornbeam	<i>Carpinus caroliniana</i>	
Arrowfeather threeawn	<i>Aristida purpurascens</i>	
Axiflower	<i>Mecardonia acuminata subsp. peninsularis</i>	
Bahiagrass*	<i>Paspalum notatum var. saurae</i>	
Bald cypress	<i>Taxodium distichum</i>	
Ballmoss	<i>Tillandsia recurvata</i>	
Bartram's airplant	<i>Tillandsia bartramii</i>	
Bighead rush	<i>Juncus megacephalus</i>	
Bladderpod.....	<i>Sesbania vesicaria</i>	
Blue maidencane	<i>Amphicarpum muhlenbergianum</i>	
Brazilian Vervain	<i>Verbena brasiliensis</i>	
Broadleaf cattail.....	<i>Typha latifolia</i>	
Bulltongue arrowhead.....	<i>Sagittaria lancifolia</i>	
Butterfly orchid.....	<i>Encyclia tampensis</i>	
Buttonbush	<i>Cephalanthus occidentalis</i>	
Cabbage palm	<i>Sabal palmetto</i>	
Camphor-tree *	<i>Cinnamomum camphora</i>	
Cardinal airplant	<i>Tillandsia fasciculata</i>	
Carolina ash	<i>Fraxinus caroliniana</i>	
Carolina wild petunia	<i>Ruellia caroliniana</i>	
Carolina willow	<i>Salix caroliniana</i>	
Chinese tallow tree *	<i>Sapium sebiferum</i>	
Cinnamon fern.....	<i>Osmunda cinnamomea</i>	
Citron*	<i>Citrus medica</i>	
Climbing aster	<i>Aster carolinianus</i>	
Climbing aster	<i>Symphyotrichum carolinianum</i>	
Climbing hempvines	<i>Mikania scandens</i>	
Clustered bushmint	<i>Hyptis alata</i>	
Clustered mille graine.....	<i>Oldenlandia uniflora</i>	
Coastalplain tickseed	<i>Coreopsis gladiata</i>	
Cogongrass*	<i>Imperata cylindrical</i>	
Common buttonbush	<i>Cephalanthus occidentalis</i>	
Common carpetgrass.....	<i>Axonopus fissifolius</i>	
Common cattail	<i>Typha latifolia</i>	
Common persimmon	<i>Diospyros virginiana</i>	
Common water-hyacinth*	<i>Eichhornia crassipes</i>	
Cowitch vine.....	<i>Decumaria barbara</i>	
Crossvine.....	<i>Bignonia capereolata</i>	
Crowpoison	<i>Nothoscordum bivalve</i>	
Dahoon holly	<i>Ilex cassine</i>	
Danglepod	<i>Sesbania herbacea</i>	
Dotted Duckweed *	<i>Landoltia punctata</i>	

* Non-native Species

Haw Creek Preserve State Park Plants

Common Name	Scientific Name	Primary Habitat Codes (for imperiled species)
Dwarf palmetto.....	<i>Sabal minor</i>	
Eastern poison ivy.....	<i>Toxicodendron radicans</i>	
Elephant-ear *.....	<i>Xanthosomasagittifolium</i>	
Elliott's lovegrass.....	<i>Eragrostis elliotti</i>	
False nettle.....	<i>Boehmeria cylindrica</i>	
False petunia.....	<i>Ruellia caroliniana</i>	
Fetterbush.....	<i>Lyonia lucida</i>	
Florida airplant.....	<i>Tillandsia x floridana</i>	
Florida paspalum.....	<i>Paspalum floridanum</i>	
Forked panicgrass.....	<i>Dichantherium dichotomum</i>	
Gaping panicum.....	<i>Panicum hians</i>	
Giant air plant.....	<i>Tillandsia utriculata</i>	FS, HH
Giant airplant.....	<i>Tillandsia utriculata</i>	
Giant bristlegrass.....	<i>Setaria magna</i>	
Glade lobelia.....	<i>Lobelia glandulosa</i>	
Golden polypody.....	<i>Phlebodium aureum</i>	
Grapefruit *.....	<i>Citrus X paradisi</i>	
Grapefruit*.....	<i>Citrus X aurantium</i>	
Grassy arrowhead.....	<i>Sagittaria graminea</i>	
Green ash.....	<i>Fraxinus pennsylvanica</i>	
Green-fly orchid.....	<i>Epidendrum conopseum</i>	
Groundnut.....	<i>Apios americana</i>	
Heartwing dock.....	<i>Rumex hastatulus</i>	
Hercules'-club.....	<i>Zanthoxylum clava-herculis</i>	
Inkberry.....	<i>Ilex glabra</i>	
Ironwood.....	<i>Carpinus caroliniana</i>	
Jamaica swamp grass.....	<i>Cladium jamaicense</i>	
Lance-leaved milkweed.....	<i>Asclepias lanceolata</i>	
Laurel oak; Diamond oak.....	<i>Quercus laurifolia</i>	
Leavenworth's tickseed.....	<i>Coreopsis leavenworthii</i>	
Lemon bacopa.....	<i>Bacopa caroliniana</i>	
Lesser creeping rush.....	<i>Juncus repens</i>	
Live oak.....	<i>Quercus virginiana</i>	
Lizard's-tail.....	<i>Saururus cernuus</i>	
Longleaf pine.....	<i>Pinus palustris</i>	
Longspike triden.....	<i>Tridens strictus</i>	
Lyreleaf sage.....	<i>Salvia lyrata</i>	
May haw.....	<i>Crataegus aestivalis</i>	
Mistletoe.....	<i>Phoradendron serotinum</i>	
Narrowleaf yellowtops.....	<i>Flaveria linearis</i>	
Needleleaf witchgrass.....	<i>Dichantherium aciculare</i>	
Netted chain fern.....	<i>Woodwardia areolata</i>	
Oak mistletoe.....	<i>Phoradendron leucarpum</i>	
Orange milkwort.....	<i>Polygala lutea</i>	
Pennsylvania blackberry.....	<i>Rubus pensilvanicus</i>	
Peppervine.....	<i>Ampelopsis arborea</i>	

* Non-native Species

Haw Creek Preserve State Park Plants

Common Name	Scientific Name	Primary Habitat Codes (for imperiled species)
Pickerelweed	<i>Pontederia cordata</i>	
Pickerelweed	<i>Pontederia cordata</i>	
Piedmont marshelder.....	<i>Iva microcephala</i>	
Pinebarren fluffgrass	<i>Tridens ambiguous</i>	
Pineland rayless goldenrod	<i>Bigelowia nudata</i>	
Pitted stripeeed	<i>Piriqueta cistoides subsp. caroliniana</i>	
Pond pine.....	<i>Pinus serotina</i>	
Pond-cypress.....	<i>Taxodium ascendens</i>	
Popcorn tree*	<i>Sapium sebiferum</i>	
Queensdelight	<i>Stillingia sylvatica</i>	
Rattlebox*	<i>Sesbania punicea</i>	
Red cedar	<i>Juniperus virginiana</i>	
Red hibiscus	<i>Hibiscus coccineus</i>	
Red maple.....	<i>Acer rubrum</i>	
Redbay	<i>Persea borbonia</i>	
Redtop panicum.....	<i>Panicum rigidulum</i>	
Resurrection fern	<i>polypodioides var. michauxiana</i>	
Rice button aster	<i>Symphotrichum dumosum</i>	
Royal fern	<i>Osmunda regalis</i>	
Royal fern	<i>Osmunda regalis var. spectabilis</i>	
Sand cordgrass.....	<i>Spartina bakeri</i>	
Sandweed	<i>Hypericum fasciculatum</i>	
Savannah panicum.....	<i>Phanopyrum gymnocarpon</i>	
Saw palmetto	<i>Serenoa repens</i>	
Sawgrass	<i>Cladium jamaicense</i>	
Seven-sisters	<i>Crinum americanum</i>	
Shiny blueberry	<i>Vaccinium myrsinites</i>	
Shoestring fern.....	<i>Vittaria lineata</i>	
Shore rush	<i>Juncus marginatus</i>	
Showy milkwort	<i>Polygala violacea</i>	
Slash pine	<i>Pinus elliotii</i>	
Slender goldenrod.....	<i>Euthamia caroliniana</i>	
Small viburnum	<i>Viburnum obovatum</i>	
Soft rush.....	<i>Juncus effuses</i>	
Soft rush.....	<i>Juncus effuses ssp. solutus</i>	
Sour orange*	<i>Citrus x aurantium</i>	
Southern bayberry	<i>Myrica cerifera</i>	
Southern beaksedge.....	<i>Rhynchospoa microcarpa</i>	
Southern magnolia	<i>Magnolia grandiflora</i>	
Southern needleleaf	<i>Tillandsia setacea</i>	
Southern red cedar	<i>Juniperus sillicicola</i>	
Southern red maple	<i>Acer rubrum</i>	
Southern wild rice	<i>Zizaniopsis miliacea</i>	
Spanish moss	<i>Tillandsia usneoides</i>	
Sparkleberry	<i>Vaccinium arboreum</i>	
Spider lily	<i>Hymenocallis crassifolia</i>	

* Non-native Species

Haw Creek Preserve State Park Plants

Common Name	Scientific Name	Primary Habitat Codes (for imperiled species)
St. Augustinegrass *	<i>Stenotaphrum secundatum</i>	
Starrush whitetop	<i>Rhynchospora colorata</i>	
String-lily, Swamp lily	<i>Crinum americanum</i>	
Sugarberry	<i>Celtis laevigata</i>	
Swamp bay	<i>Persea palustris</i>	
Swamp dock	<i>Rumex verticillatus</i>	
Swamp doghobble	<i>Leucothoe racemosa</i>	
Swamp dogwood	<i>Cornus foemina</i>	
Swamp milkweed	<i>Asclepias perennis</i>	
Swamp rose	<i>Rosa palustris</i>	
Swamp rosemallow	<i>Hibiscus grandiflorus</i>	
Swamp tupelo	<i>Nyssa sylvatica var. biflora</i>	
Swamp twinflower	<i>Dyschoriste humistrata</i>	
Sweet orange *	<i>Citrus sinensis</i>	
Sweetbay	<i>Magnolia virginiana</i>	
Sweetbroom	<i>Scoparia dulcis</i>	
Sweetgum	<i>Liquidambar styraciflua</i>	
Switch cane	<i>Arundinaria gigantea</i>	
Switchgrass	<i>Panicum virgatum</i>	
Tall threeawn	<i>Aristida patula</i>	
Toothed midsorus fern	<i>Blechnum serrulatum</i>	
Toothpetal false reiorchid	<i>Habenaria floribunda</i>	
Torpedogras *	<i>Panicum repens</i>	
Trumpet creeper	<i>Campsis radicans</i>	
Trumpet-vine	<i>Campsis radicans</i>	
Tuberous sword fern *	<i>Nephrolepis cordifolia</i>	
Virginia live oak	<i>Quercus virginiana</i>	
Walter's viburnum	<i>Viburnum obovatum</i>	
Water ash; Pop ash	<i>Fraxinus caroliniana</i>	
Water hyacinth *	<i>Eichhornia crassipes</i>	
Water lettuce *	<i>Pistia stratiotes</i>	
Water locust	<i>Gleditsia aquatica</i>	
Water oak	<i>Quercus nigra</i>	
Water spangles *	<i>Salvinia minima</i>	
Water toothleaf	<i>Stillingia aquatica</i>	
Waterspider false reinorchid	<i>Habenaria repens</i>	
Wax myrtle	<i>Myrica cerifera</i>	
White waterlily	<i>Nymphaea odorata</i>	
Whitegrass	<i>Leersia virginica</i>	
Wild taro*	<i>Colocasia esculenta</i>	
Winged sumac	<i>Rhus copallinum</i>	
Wiregrass	<i>Aristida stricta</i>	
Yaupon holly	<i>Ilex vomitoria</i>	
Coastal rosegetian	<i>Sabastia calycina</i>	

Haw Creek Preserve State Park Animals

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

Black crappie	<i>Pomoxis nigromaculatus</i>	
Bowfin	<i>Amia calva</i>	
Florida gar	<i>Lepisosteus platyrhincus</i>	
Largemouth bass	<i>Micropterus salmoides</i>	
Redear sunfish.....	<i>Lepomis microlophus</i>	
Shortnose Sturgeon	<i>Acipenser brevirostrum</i>	BST

AMPHIBIANS

Florida cricket frog	<i>Acris gryllus</i>	
Florida Leopard Frog.....	<i>Rana utricularia sphenoccephala</i>	
Green Tree Frog.....	<i>Hyla cinerea</i>	

REPTILES

American Alligator.....	<i>Alligator mississippiensis</i>	
Florida cottonmouth	<i>Agkistrodon piscivorus conanti</i>	
Green Anole	<i>Anolis carolinensis carolinensis</i>	
Gopher Tortoise.....	<i>Gopherus polyphemus</i>	MF, PP

BIRDS

Bald Eagle	<i>Haliaeetus leucocephalus</i>	
Barred Owl.....	<i>Strix varia</i>	
Belted Kingfisher.....	<i>Ceryle alcyon</i>	
Black Vulture	<i>Coragyps atratus</i>	
Black-crowned night heron.....	<i>Nycticorax nycticorax</i>	
Blue-gray Gnatcatcher	<i>Polioptila caerulea</i>	
Carolina Wren.....	<i>Thryothorus ludovicianus</i>	
Common Yellowthroat.....	<i>Geothlypis trichas</i>	
Cooper's hawk	<i>Accipiter cooperii</i>	
Double-crested Cormorant	<i>Phalacrocorax auritus</i>	
Great Blue Heron	<i>Ardea herodias</i>	
Great egret	<i>Ardea alba</i>	
Limpkin	<i>Aramus guarauna</i>	BST, BM, DM
Little Blue Heron	<i>Egretta caerulea</i>	BST, BM, DM
Mourning Dove	<i>Zenaida macroura</i>	
Northern Cardinal	<i>Cardinalis cardinalis</i>	
Northern Parula	<i>Parula americana</i>	
Osprey	<i>Pandion haliaetus</i>	
Pileated Woodpecker	<i>Dryocopus pileatus</i>	
Pine Warbler	<i>Dendroica pinus</i>	

Haw Creek Preserve State Park Animals

Common Name	Scientific Name	Primary Habitat Codes (for imperiled species)
Red-bellied Woodpecker.....	<i>Melanerpes carolinus</i>	
Red-shouldered Hawk.....	<i>Buteo lineatus</i>	
Reddish Egret.....	<i>Egretta rufescens</i>	BST, BM, DM
Snowy egret.....	<i>Egretta thula</i>	BST, BM, DM
Summer Tanager	<i>Piranga rubra</i>	
Swallow-tailed Kite.....	<i>Elanoides forficatus</i>	
Tree Swallow.....	<i>Tachycineta bicolor</i>	
Tricolored heron.....	<i>Tachycineta bicolor</i>	BST, BM, DM
Tufted Titmouse.....	<i>Parus bicolor</i>	
White ibis.....	<i>Eudocimus albus</i>	BST, BM, DM
White-eyed Vireo	<i>Vireo griseus</i>	
Wood stork	<i>Mycteria Americana</i>	BST, BM, DM
Yellow-crowned night heron	<i>Nyctanassa violaceus</i>	
Yellow-throated Vireo	<i>Vireo flavifrons</i>	

MAMMALS

Feral Pig *	<i>Sus scrofa</i>	
Gray Squirrel.....	<i>Sciurus carolinensis</i>	
Nine banded Armadillo.....	<i>Dasypus novemcinctus</i>	
West Indian Manatee.....	<i>Trichechus manatus latirostris</i>	BST
White-tailed Deer	<i>Odocoileus virginianus</i>	

* Non-native Species

Primary Habitat Codes

TERRESTRIAL

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

PALUSTRINE

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

Primary Habitat Codes

Wet Prairie WP

LACUSTRINE

Clastic Upland Lake CULK

Coastal Dune Lake CDLK

Coastal Rockland Lake CRLK

Flatwoods/Prairie FPLK

Marsh Lake MLK

River Floodplain Lake RFLK

Sandhill Upland Lake SULK

Sinkhole Lake SKLK

Swamp Lake SWLK

RIVERINE

Alluvial Stream AST

Blackwater Stream BST

Seepage Stream SST

Spring-run Stream SRST

SUBTERRANEAN

Aquatic Cave ACV

Terrestrial Cave TCV

ESTUARINE

Algal Bed EAB

Composite Substrate ECPS

Consolidated Substrate ECNS

Coral Reef ECR

Mollusk Reef EMR

Octocoral Bed EOB

Seagrass Bed ESGB

Sponge Bed ESPB

Unconsolidated Substrate EUS

Worm Reef EWR

Primary Habitat Codes

MARINE

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

ALTERED LANDCOVER TYPES

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

MISCELLANEOUS

Many Types of Communities	MTC
Overflying	OF

Primary Habitat Codes

Addendum 6—Imperiled Species Ranking Definitions

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.

FNAL 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)

Imperiled Species Ranking Definitions

- 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.

Imperiled Species Ranking Definitions

- 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.

Imperiled Species Ranking Definitions

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

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

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

Addendum 7—Cultural Information

Management Procedures for Archaeological and Historical Sites and Properties on State-Owned or Controlled Properties (revised March 2013)

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.

Management Procedures for Archaeological and Historical Sites and Properties on State-Owned or Controlled Properties (revised March 2013)

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

Eligibility Criteria for National Register of Historic Places

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

Eligibility Criteria for National Register of Historic Places

- 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.

Preservation Treatments as Defined by Secretary of Interior's Standards and Guidelines

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.

Preservation Treatments as Defined by Secretary of Interior's Standards and Guidelines

Addendum 8—Timber Management Analysis

Haw Creek Preserve State Park Timber Management Analysis

The timber assessment required by Chapters 253 and 259, Florida Statutes, was conducted by Jason DePue and Maria Melnechuk, DRP in consultation with the Florida Forest Service.

Pine Flatwoods Tract at Haw Creek State Preserve

There are 160 acres of pine plantation at Haw Creek State Preserve with a 30-year-old stand of slash pines. The existing pines regenerated by natural seeding from surrounding tracts of commercial timber following a clear-cut harvest by Union Camp Corp. in the early 1970s. Standard quantitative methods were used to assess stand structure and composition in a representative sample plot, 20 m (65.6 ft.) x 20 m (62.6 ft.) on 2 Feb. 2000.

The average stand density is about 350 trees per acre. Trunk diameters range from 5 inches to 12 inches dbh. The average diameter is 8-9 inches dbh. Tree heights are 70-75 feet. The flatwoods understory is comprised of cabbage palms (crowns 10-15 ft.); some pole-size pines (2-4 inches dbh) and scattered hardwoods, including sweetgum, red maple, live oak, laurel oak and an occasional camphor-tree, a non-native species. The ground cover is saw palmetto and low cabbage palms with open patches comprised of scattered grasses and forbs, hardwood root sprouts, and pine litter. There were only a few pine seedlings in the sample plot.

The flatwoods soils at Haw Creek are comprised of Favoretta clay and Winder fine sand (USDA). Both soils have high water tables in the wet season and generally poor drainage year round due to the low permeability of clay layers in the upper soil layers. Favoretta and Winder soils are less acidic than the typical sandy spodosols of mesic flatwoods.

These soil properties will influence stand growth and composition and place constraints on the season of harvest operations. The mean site index* for slash pine on Winder soils is 90 on a 50-year site curve (USDA), indicative of relatively high productivity compared to stand growth on other flatwoods soils. The existing size classes in the pine stand at Haw Creek could be harvested for chip n'saw lumber and pulpwood.

Access to the pine flatwoods tract at Haw Creek is from an adjacent private landowner's property on County Road 305. An old logging road provides access to the interior of the stand.

Park management will be assisted by the Florida Forest Service regional Senior Forester (OSL) in the development of a harvest plan for the pine flatwoods tract. At Haw Creek, the harvest plan must support the use designation for a state preserve: A state preserve is designed to preserve and protect representative samples, of viable size, of natural conditions characteristic of Florida. In this sense, the objective for a timber harvest, and succeeding management actions, is to restore natural community structure and composition.

Haw Creek Preserve State Park Timber Management Analysis

*USDA defines site index as "a designation of the quality of a forest site based on the height of the dominant stand at an arbitrarily chosen age." For example, if the average height attained by dominant and codominant trees in a fully stocked stand at the age of 50 years is 75 feet, the site index is 75 feet (USDA Soil Survey of Flagler County)

Prepared by: Jason DePue and Maria Melnechuk, July 2013

Addendum 9 —Land Management Review

March 5, 2012

TO: Marianne Gengenbach, Program Administrator
Division of State Lands 

FROM: Parks Small, Chief, Bureau of Natural and Cultural Resources
Division of Recreation and Parks

Albert Gregory, Chief, Office of Park Planning 
Division of Recreation and Parks

SUBJECT: Response to Draft Land Management Review (LMR)
Haw Creek Preserve State Park

The Land Management Review draft report provided to DRP determined that management of Haw Creek Preserve State Park by the Division of Recreation and Parks met the two tests prescribed by law. Namely, the review team concluded that the land is being managed for the purposes for which it was acquired and in accordance with the land management plan.

Below are Additional Recommendations and Checklist Findings (items the LMR determined should be further addressed in the management plan update) of the draft LMR report, with our Manager's Response to each. The responses were prepared via a coordinated effort of the park, district office, and our offices.

Given the extreme pine density currently existing in the mesic flatwoods at this park, the team recommends DRP explore opportunities to coordinate with adjacent forest landowners to share services of a logging contractor to expedite the desired timber thinning.

(VOTE: 6+, 0-)

Managing Agency Response: Agree; DRP will investigate this option.

If not already initiated, the team recommends DRP initiate written contact with the Cowart Estate to request legal access easement for DRP resource management equipment to traverse their property. (VOTE: 6+, 0-)

Managing Agency Response: Agree; DRP has been working on obtaining a written right-of-way easement with the Cowart Estate for several months. Once the ROW is in hand, several of the goals and objectives for the park could be completed.

The team recommends DRP continue its efforts at identifying and signing the boundary of the park, including along Haw Creek and Crescent Lake.(VOTE: 6+, 0-)

Managing Agency Response: Agree; DRP will continue to post signage on the park boundary where needed.

The team recommends that park staff coordinate with other state and local agencies in an effort to gain partnerships and greater coordination regarding the management and health of the natural resources within the park.

(VOTE: 6+, 0-)

Managing Agency Response: Agree; Developing partnerships with other state agencies and local land owners is a goal of DRP that allows us all to get more done with less. This goal is outlined on page 5 of 2003 Unit Management Plan (UMP).

The team recommends that DRP staff explore all opportunities for increasing visitor outreach, e.g. website and brochures. (VOTE: 6+, 0-)

Managing Agency Response: Agree; DRP will continue to work on developing a website that will interpret both the natural and cultural resources of the park as well as the recreational opportunities available at this park. It may not be possible to distribute brochures at the park, but there may be an opportunity to work with Flagler County to develop interpretational displays that could be located on the county's property immediately adjacent to the park as mentioned on page 5 of the park's Unit Management Plan (UMP).

The team recommends that staff contact paddling organizations to establish Haw Creek Preserve State Park as a canoeing and kayaking destination. (VOTE: 6+, 0-)

Managing Agency Response: Agree; DRP will investigate the feasibility of establishing Haw Creek as a destination for canoeing and kayaking.

FIELD REVIEW

Management of natural communities, specifically mesic flatwoods, with documentation in the management plan.

Managing Agency Response: Agree; Although a description of the mesic flatwoods community and some overall goals for this community are listed on pages 4, 10, 14, 15 of the 2003 approved Unit Management Plan (UMP) for the park; it does not go into great detail. A more in depth management section will be added to the next UMP revision.

Increased resource management activities related to prescribed burning, specifically the area being burned and the frequency at which these properties are being burned, with documentation in the management plan.

Managing Agency Response: Agree; The 2003 UMP does not describe the particular burn frequencies and areas to be burned for each natural community, but the next UMP scheduled for 2013 will include this information. The focus of the 2003 UMP was to set realistic goals for managing this park with fire and that was to obtain a ROW access to the park so that equipment could be brought onsite to conducted fuel reduction activities prior to burning.

Non-native, invasive and problem species, specifically the prevention and control of animals, with documentation in the management plan.

Managing Agency Response: Agree; Although the 2003 UMP describes some problem species on pages 18 and 19 explains the need for exotic animal control, it does not specifically address how to prevent and control these species other than mentioning that DRP guidelines will be followed during removal. However, the plan does state on page 15 that boundaries need to be surveyed, cleared and appropriate fencing needs to be installed along with the need to obtain a ROW access to the park. With no existing ROW established, a comprehensive nuisance and invasive animal species control program is not feasible. DRP feels that accomplishing these goals would be a step in the right direction in preventing and controlling exotic animal species at the park.

The need for surface water monitoring, specifically quality and quantity, with documentation in the management plan.

Managing Agency Response: Park and District staff will not be able to maintain a water quality monitoring program on their own. Instead, staff will attempt to enlist assistance of the Water Management District (or local Water Authority or local health department) to assist the park in regular water quality/quantity monitoring.

Increased resource protection, specifically gates & fencing, with documentation in the management plan.

Managing Agency Response: Agree; The current UMP on pages 15 and 16 expresses the need for boundary surveys, gates, and fencing. To date, the park has been able to survey most of the boundaries where fences are needed but funding for gates and fencing has not been secured because the primary focus has been to gain access to the site by the use of a ROW. A ROW is needed in order to bring land clearing equipment and fencing crews into the park to fence the park boundaries.

Adjacent property concerns, specifically legal access, with documentation in the management plan.

Managing Agency Response: Agree; Although the current plan adequately describes the issue related to the lack of legal access from surrounding uplands, the Division will continue to pursue legal access from adjacent property owners.

Discussion regarding public access, specifically land-based access, with documentation in the management plan.

Managing Agency Response: Disagree; As mentioned above and on pages 15 and 23 of the UMP, a ROW access is one of DRP primary goals for the upland portion of the park. Once a ROW is obtained, then the appropriate public access can be developed but is not currently the focus of DRP. Water access offers the best and most immediate access to the park.

Discussion regarding environmental education & outreach, specifically wildlife, interpretive facilities and signs, with documentation in the management plan.

Managing Agency Response: Agree; In the Land Use Component of the UMP, it does not specifically address environmental education and outreach outside of a kiosk at the Flagler County property. A description of the potential educational opportunities will be expanded in the next UMP coming up in 2013.

Increased infrastructure, specifically funding, with documentation in the management plan.

Managing Agency Response: Agree; In Addendum 7, it describes the need for funding to carry out the goals and objectives of the UMP. The updated unit management plan will further address land management funding needs. However, Division funding is determined annually by the Florida Legislature and funds are allocated to the 161 state parks according to priority needs.

Thank you for your attention.

GK

CC: Larry Fooks, Chief, Bureau of Parks District 3
Robert Yero, Assistant Chief, Bureau of Parks District 3
Phil Rand, Park Manager, Haw Creek Preserve State Park
Jason Depue, Environmental Specialist, Bureau of Parks District 3

