



FLORIDA DEPARTMENT OF Environmental Protection

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Tallahassee, FL 32399

Ron DeSantis
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Memorandum

TO: James Parker
Office of Environmental Services
Division of State Lands

FROM: Yasmine Armaghani, Planner
Office of Park Planning
Division of Recreation and Parks

SUBJECT: BLUE SPRING STATE PARK
Ten Year Management Plan Update (Lease No. 4288)
Acquisition and Restoration Council (ARC) Public Hearing

DATE: July 5, 2022

Attached is the ARC executive summary, the Division of State Lands checklist and a copy of the subject management plan update. This plan is being submitted for the Division of State Lands' compliance review and for review by ARC members at their October 2022 meeting.

For your convenience and use, six discs with the subject management plan update, along with a printed hardcopy, are also being provided with this memorandum.

Please contact me by email at Yasmine.Armaghani@floridadep.gov or by phone at 850.245.3066 if there are any questions related to this update.

Thank you for your assistance.

YA:dpd
Attachments

cc: Shauna Allen

LAND MANAGEMENT PLAN COMPLIANCE CHECKLIST

→ Required for State-owned conservation lands over 160 acres ←

Instructions for managers:

Complete each item and fill in the applicable correlating **page numbers and/or appendix** where the item can be found within the land management plan (LMP). If an item does not apply to the subject property, please describe that fact on a correlating page number of the LMP. Do not mark an "N/A" for any items below.

For more information, please visit the stewardship portion of the Division of State Lands' website at: <http://www.dep.state.fl.us/lands/stewardship.htm>.

Section A: Acquisition Information Items

Item #	Requirement	Statute/Rule	Page Numbers and/or Appendix
1.	The common name of the property.	18-2.018 & 18-2.021	1, Add 2
2.	The land acquisition program, if any, under which the property was acquired.	18-2.018 & 18-2.021	1, Add 2
3.	Degree of title interest held by the Board, including reservations and encumbrances such as leases.	18-2.021	1, Add 2
4.	The legal description and acreage of the property.	18-2.018 & 18-2.021	1, Add 2
5.	A map showing the approximate location and boundaries of the property, and the location of any structures or improvements to the property.	18-2.018 & 18-2.021	73
6.	An assessment as to whether the property, or any portion, should be declared surplus. <i>Provide information regarding assessment and analysis in the plan, and provide corresponding map.</i>	18-2.021	77
7.	Identification of other parcels of land within or immediately adjacent to the property that should be purchased because they are essential to management of the property. <i>Please clearly indicate parcels on a map.</i>	18-2.021	77,82
8.	Identification of adjacent land uses that conflict with the planned use of the property, if any.	18-2.021	7
9.	A statement of the purpose for which the lands were acquired, the projected use or uses as defined in 253.034 and the statutory authority for such use or uses.	259.032(10)	1, Add 1
10.	Proximity of property to other significant State, local or federal land or water resources.	18-2.021	3, 7

Section B: Use Items

Item #	Requirement	Statute/Rule	Page Numbers and/or Appendix
11.	The designated single use or multiple use management for the property, including use by other managing entities.	18-2.018 & 18-2.021	1,7
12.	A description of past and existing uses, including any unauthorized uses of the property.	18-2.018 & 18-2.021	2,71
13.	A description of alternative or multiple uses of the property considered by the lessee and a statement detailing why such uses were not adopted.	18-2.018	2
14.	A description of the management responsibilities of each entity involved in the property's management and how such responsibilities will be coordinated.	18-2.018	7,
15.	Include a provision that requires that the managing agency consult with the Division of Historical Resources, Department of State before taking actions that may adversely affect archeological or historical resources.	18-2.021	Add 7,
16.	Analysis/description of other managing agencies and private land managers, if any, which could facilitate the restoration or management of the land.	18-2.021	
17.	A determination of the public uses and public access that would be consistent with the purposes for which the lands were acquired.	259.032(10)	71-79
18.	A finding regarding whether each planned use complies with the 1981 State Lands Management Plan, particularly whether such uses represent "balanced public utilization," specific agency statutory authority and any other legislative or executive directives that constrain the use of such property.	18-2.021	

19.	Letter of compliance from the local government stating that the LMP is in compliance with the Local Government Comprehensive Plan.	BOT requirement	Add 10
20.	An assessment of the impact of planned uses on the renewable and non-renewable resources of the property, including soil and water resources, and a detailed description of the specific actions that will be taken to protect, enhance and conserve these resources and to compensate/mitigate damage caused by such uses, including a description of how the manager plans to control and prevent soil erosion and soil or water contamination.	18-2.018 & 18-2.021	9-69 ,71-79
21.	*For managed areas larger than 1,000 acres, an analysis of the multiple-use potential of the property which shall include the potential of the property to generate revenues to enhance the management of the property provided that no lease, easement, or license for such revenue-generating use shall be entered into if the granting of such lease, easement or license would adversely affect the tax exemption of the interest on any revenue bonds issued to fund the acquisition of the affected lands from gross income for federal income tax purposes, pursuant to Internal Revenue Service regulations.	18-2.021 & 253.036	70, Add 8, 2
22.	If the lead managing agency determines that timber resource management is not in conflict with the primary management objectives of the managed area, a component or section, prepared by a qualified professional forester, that assesses the feasibility of managing timber resources pursuant to section 253.036, F.S.	18-021	Add 9
23.	A statement regarding incompatible use in reference to Ch. 253.034(10).	253.034(10)	2

*The following taken from 253.034(10) is not a land management plan requirement; however, it should be considered when developing a land management plan: The following additional uses of conservation lands acquired pursuant to the Florida Forever program and other state-funded conservation land purchase programs shall be authorized, upon a finding by the Board of Trustees, if they meet the criteria specified in paragraphs (a)-(e): water resource development projects, water supply development projects, storm-water management projects, linear facilities and sustainable agriculture and forestry. Such additional uses are authorized where: (a) Not inconsistent with the management plan for such lands; (b) Compatible with the natural ecosystem and resource values of such lands; (c) The proposed use is appropriately located on such lands and where due consideration is given to the use of other available lands; (d) The using entity reasonably compensates the titleholder for such use based upon an appropriate measure of value; and (e) The use is consistent with the public interest.

Section C: Public Involvement Items

Item #	Requirement	Statute/Rule	Page Numbers and/or Appendix
24.	A statement concerning the extent of public involvement and local government participation in the development of the plan, if any.	18-2.021	7, Add 2
25.	The management prospectus required pursuant to paragraph (9)(d) shall be available to the public for a period of 30 days prior to the public hearing.	259.032(10)	7, Add 2
26.	LMPs and LMP updates for parcels over 160 acres shall be developed with input from an advisory group who must conduct at least one public hearing within the county in which the parcel or project is located. <i>Include the advisory group members and their affiliations, as well as the date and location of the advisory group meeting.</i>	259.032(10)	7, Add 2
27.	Summary of comments and concerns expressed by the advisory group for parcels over 160 acres	18-2.021	Add 2
28.	During plan development, at least one public hearing shall be held in each affected county. Notice of such public hearing shall be posted on the parcel or project designated for management, advertised in a paper of general circulation, and announced at a scheduled meeting of the local governing body before the actual public hearing. <i>Include a copy of each County's advertisements and announcements (meeting minutes will suffice to indicate an announcement) in the management plan.</i>	253.034(5) & 259.032(10)	7
29.	The manager shall consider the findings and recommendations of the land management review team in finalizing the required 10-year update of its management plan. <i>Include manager's replies to the team's findings and recommendations.</i>	259.036	Add 2
30.	Summary of comments and concerns expressed by the management review team, if required by Section 259.036, F.S.	18-2.021	Add 2
31.	If manager is not in agreement with the management review team's findings and recommendations in finalizing the required 10-year update of its management plan, the managing agency should explain why they disagree with the findings or recommendations.	259.036	Add 2

Section D: Natural Resources

Item #	Requirement	Statute/Rule	Page Numbers and/or Appendix
32.	Location and description of known and reasonably identifiable renewable and non-renewable resources of the property regarding soil types. <i>Use brief descriptions and include USDA maps when available.</i>	18-2.021	17, Add 4
33.	Insert FNAI based natural community maps when available.	ARC consensus	21
34.	Location and description of known and reasonably identifiable renewable and non-renewable resources of the property regarding outstanding native landscapes containing relatively unaltered flora, fauna, and geological conditions.	18-2.021	21
35.	Location and description of known and reasonably identifiable renewable and non-renewable resources of the property regarding unique natural features and/or resources including but not limited to virgin timber stands, scenic vistas, natural rivers and streams, coral reefs, natural springs, caverns, and large sinkholes.	18-2.018 & 18-2.021	21
36.	Location and description of known and reasonably identifiable renewable and non-renewable resources of the property regarding beaches and dunes.	18-2.021	21
37.	Location and description of known and reasonably identifiable renewable and non-renewable resources of the property regarding mineral resources, such as oil, gas and phosphate, etc.	18-2.018 & 18-2.021	21
38.	Location and description of known and reasonably identifiable renewable and non-renewable resources of the property regarding fish and wildlife, both game and non-game, and their habitat.	18-2.018 & 18-2.021	21
39.	Location and description of known and reasonably identifiable renewable and non-renewable resources of the property regarding State and Federally listed endangered or threatened species and their habitat.	18-2.021	21
40.	The identification or resources on the property that are listed in the Natural Areas Inventory. <i>Include letter from FNAI or consultant where appropriate.</i>	18-2.021	
41.	Specific description of how the managing agency plans to identify, locate, protect, and preserve or otherwise use fragile, nonrenewable natural and cultural resources.	259.032(10)	71-79
42.	Habitat Restoration and Improvement		
42-A.	Describe management needs, problems and a desired outcome and the key management activities necessary to achieve the enhancement, protection and preservation of restored habitats and enhance the natural, historical and archeological resources and their values for which the lands were acquired.		38
42-B.	Provide a detailed description of both short (2-year planning period) and long-term (10-year planning period) management goals, and a priority schedule based on the purposes for which the lands were acquired and include a timeline for completion.	259.032(10) & 253.034(5) ↓	85-89
42-C.	The associated measurable objectives to achieve the goals.		38-44
42-D.	The related activities that are to be performed to meet the land management objectives and their associated measures. <i>Include fire management plans - they can be in plan body or an appendix.</i>		38-44, 85-89
42-E.	A detailed expense and manpower budget in order to provide a management tool that facilitates development of performance measures, including recommendations for cost-effective methods of accomplishing those activities.		85-89
43.	***Quantitative data description of the land regarding an inventory of forest and other natural resources and associated acreage. <i>See footnote.</i>	253.034(5)	
44.	Sustainable Forest Management, including implementation of prescribed fire management		
44-A.	Management needs, problems and a desired outcome (see requirement for # 42-A).	18-2.021, 253.034(5) & 259.032(10) ↓	38-42
44-B.	Detailed description of both short and long-term management goals (see requirement for # 42-B).		85-89

44-C.	Measurable objectives (see requirement for #42-C).		85-89
44-D.	Related activities (see requirement for #42-D).		85-89
44-E.	Budgets (see requirement for #42-E).		85-89
45.	Imperiled species, habitat maintenance, enhancement, restoration, or population restoration		
45-A.	Management needs, problems and a desired outcome (see requirement for # 42-A).	259.032(10) & 253.034(5) ↓	44
45-B.	Detailed description of both short and long-term management goals (see requirement for # 42-B).		85-89
45-C.	Measurable objectives (see requirement for #42-C).		85-89
45-D.	Related activities (see requirement for #42-D).		85-89
45-E.	Budgets (see requirement for #42-E).		85-89
46.	***Quantitative data description of the land regarding an inventory of exotic and invasive plants and associated acreage. <i>See footnote.</i>	253.034(5)	
47.	Place the Arthropod Control Plan in an appendix. If one does not exist, provide a statement as to what arrangement exists between the local mosquito control district and the management unit.	BOT requirement via lease language	69
48.	Exotic and invasive species maintenance and control		
48-A.	Management needs, problems and a desired outcome (see requirement for # 42-A).	259.032(10) & 253.034(5) ↓	51-57
48-B.	Detailed description of both short and long-term management goals (see requirement for # 42-B).		85-89
48-C.	Measurable objectives (see requirement for #42-C).		85-89
48-D.	Related activities (see requirement for #42-D).		85-89
48-E.	Budgets (see requirement for #42-E).		85-89

Section E: Water Resources

Item #	Requirement	Statute/Rule	Page Numbers and/or Appendix
49.	A statement as to whether the property is within and/or adjacent to an aquatic preserve or a designated area of critical state concern or an area under study for such designation. <i>If yes, provide a list of the appropriate managing agencies that have been notified of the proposed plan.</i>	18-2.018 & 18-2.021	7
50.	Location and description of known and reasonably identifiable renewable and non-renewable resources of the property regarding water resources, including water classification for each water body and the identification of any such water body that is designated as an Outstanding Florida Water under Rule 62-302.700, F.A.C.	18-2.021	20-37
51.	Location and description of known and reasonably identifiable renewable and non-renewable resources of the property regarding swamps, marshes, and other wetlands.	18-2.021	20-37
52.	***Quantitative description of the land regarding an inventory of hydrological features and associated acreage. <i>See footnote.</i>	253.034(5)	20-37
53.	Hydrological Preservation and Restoration		
53-A.	Management needs, problems and a desired outcome (see requirement for # 42-A).	259.032(10) & 253.034(5) ↓	18-20
53-B.	Detailed description of both short and long-term management goals (see requirement for # 42-B).		85-89
53-C.	Measurable objectives (see requirement for #42-C).		85-89
53-D.	Related activities (see requirement for #42-D).		85-89
53-E.	Budgets (see requirement for #42-E).		85-89

Section F: Historical, Archeological and Cultural Resources

Item #	Requirement	Statute/Rule	Page Numbers and/or Appendix
54.	**Location and description of known and reasonably identifiable renewable and non-renewable resources of the property regarding archeological and historical resources. <i>Include maps of all cultural resources except Native American sites, unless such sites are major points of interest that are open to public visitation.</i>	18-2.018, 18-2.021 & per DHR's request	71-79
55.	***Quantitative data description of the land regarding an inventory of significant land, cultural or historical features and associated acreage.	253.034(5)	67
56.	A description of actions the agency plans to take to locate and identify unknown resources such as surveys of unknown archeological and historical resources.	18-2.021	57,67
57.	Cultural and Historical Resources	259.032(10) & 253.034(5) ↓	
57-A.	Management needs, problems and a desired outcome (see requirement for # 42-A).		67, 69,85-89,
57-B.	Detailed description of both short and long-term management goals (see requirement for # 42-B).		85-89
57-C.	Measurable objectives (see requirement for #42-C).		85-89
57-D.	Related activities (see requirement for #42-D).		85-89
57-E.	Budgets (see requirement for #42-E).		85-89

**While maps of Native American sites should not be included in the body of the management plan, the DSL urges each managing agency to provide such information to the Division of Historical Resources for inclusion in their proprietary database. This information should be available for access to new managers to assist them in developing, implementing and coordinating their management activities.

Section G: Facilities (Infrastructure, Access, Recreation)

Item #	Requirement	Statute/Rule	Page Numbers and/or Appendix
58.	***Quantitative data description of the land regarding an inventory of infrastructure and associated acreage. <i>See footnote.</i>	253.034(5)	85 - 69
59.	Capital Facilities and Infrastructure	259.032(10) & 253.034(5) ↓	
59-A.	Management needs, problems and a desired outcome (see requirement for # 42-A).		79
59-B.	Detailed description of both short and long-term management goals (see requirement for # 42-B).		85-89
59-C.	Measurable objectives (see requirement for #42-C).		85-89
59-D.	Related activities (see requirement for #42-D).		85-89
59-E.	Budgets (see requirement for #42-E).		85-89
60.	*** Quantitative data description of the land regarding an inventory of recreational facilities and associated acreage.	253.034(5)	85-89
61.	Public Access and Recreational Opportunities	259.032(10) & 253.034(5) ↓	
61-A.	Management needs, problems and a desired outcome (see requirement for # 42-A).		71
61-B.	Detailed description of both short and long-term management goals (see requirement for # 42-B).		85-89
61-C.	Measurable objectives (see requirement for #42-C).		85-89
61-D.	Related activities (see requirement for #42-D).		85-89
61-E.	Budgets (see requirement for #42-E).		85-89

Section H: Other/ Managing Agency Tools

Item #	Requirement	Statute/Rule	Page Numbers and/or Appendix
62.	Place this LMP Compliance Checklist at the front of the plan.	ARC and managing agency consensus	front
63.	Place the Executive Summary at the front of the LMP. Include a physical description of the land.	ARC and 253.034(5)	front
64.	If this LMP is a 10-year update, note the accomplishments since the drafting of the last LMP set forth in an organized (categories or bullets) format.	ARC consensus	83-84
65.	Key management activities necessary to achieve the desired outcomes regarding other appropriate resource management.	259.032(10)	83-84
66.	Summary budget for the scheduled land management activities of the LMP including any potential fees anticipated from public or private entities for projects to offset adverse impacts to imperiled species or such habitat, which fees shall be used to restore, manage, enhance, repopulate, or acquire imperiled species habitat for lands that have or are anticipated to have imperiled species or such habitat onsite. The summary budget shall be prepared in such a manner that it facilitates computing an aggregate of land management costs for all state-managed lands using the categories described in s. 259.037(3) which are resource management, administration, support, capital improvements, recreation visitor services, and law enforcement activities.	253.034(5)	85-89
67.	Cost estimate for conducting other management activities which would enhance the natural resource value or public recreation value for which the lands were acquired, include recommendations for cost-effective methods in accomplishing those activities.	259.032(10)	85-89
68.	A statement of gross income generated, net income and expenses.	18-2.018	71

*** = The referenced inventories shall be of such detail that objective measures and benchmarks can be established for each tract of land and monitored during the lifetime of the plan. All quantitative data collected shall be aggregated, standardized, collected, and presented in an electronic format to allow for uniform management reporting and analysis. The information collected by the DEP pursuant to s. 253.0325(2) shall be available to the land manager and his or her assignee.

Blue Spring State Park

Acquisition and Restoration Council Draft Unit Management Plan

**STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL PROTECTION**

**Division of Recreation and Parks
July 2022**





BLUE SPRING STATE PARK

Draft Unit Management Plan

Executive Summary

Purpose and Significance of the Park

Park Interpretive Themes

Park History

Blue Spring State Park was initially acquired on August 14, 1972 with funds from the Land Acquisition Trust Fund (LATF) and the Preservation 2000 (P2000) program. The park is currently 2,643.90 acres.

Park Significance

With a rich history, Blue Spring State Park provides refuge for hundreds of manatees during the Florida winters and the park's vast acres of scrub provides habitat for the imperiled Florida Scrub jay. Bits of the past Florida history can be found within the park including the The Thursby House, the original house of one of Florida's first European settlers in the area, Mr. Louis Thursby. The house itself sits upon one of the many archeological shell midden sites representing the history of the Native Americans who once lived in the area.





BLUE SPRING STATE PARK

Draft Unit Management Plan

Executive Summary

Purpose and Significance of the Park

Park Interpretive Themes

Central Park Theme

Both a hub for aquatic exploration and a vital manatee sanctuary, Blue Spring State Park exemplifies the balance between enjoying and protecting our fragile springs.

Primary Interpretive Themes

Wildlife Sanctuary - Although Blue Spring State Park is best known as a haven for record numbers of manatees each winter, it is also home for many of Florida's threatened and endemic species year round.

Aquatic Recreation - Demonstrating the gorgeousness and fragility of the park's scenery, Blue Spring offers responsible aquatic activities on both and below the water.

History - Once a hustling and bustling fulcrum of steamboat activity, Blue Spring welcomed 19th century tourists and tradesman looking to travel along the St. Johns River.





BLUE SPRING STATE PARK

Draft Unit Management Plan

Executive Summary

Park Quick Facts

Management Authority

- **Agency:** Department of Environmental Protection - Division of Recreation and Parks
- **Acreage :** 2,643.90
- **Location:** Volusia County
- **Lease Management Agreement Number(s):** 4288
- **Use:** Single
- **Responsibility:** Public Outdoor Recreation and Conservation
- **Sublease:** None
- **Encumbrances:** See Appendix 1 for details
- **Public Involvement:** See Appendix 2 for details
- **Optimum Boundary:** Approximately 0.28 acres





BLUE SPRING STATE PARK

Draft Unit Management Plan

Executive Summary

Natural Community Composition

Percent of Total Acreage

Natural Communities	Acreage	Percentage
Floodplain Swamp	452.69	17.12%
Floodplain Marsh	336.1	12.71%
Scrub	333.59	12.61%
Mesic Hammock	232.12	8.74%
Blackwater Stream	202.33	7.65%
Hydric Hammock	191.88	7.26%
Xeric Hammock	164.05	6.2%
Upland Hardwood Forest	162.93	6.16%
Mesic Flatwood	139.88	5.59%
Scrubby Flatwood	109.52	4.14%
Altered Landcover	87.69	3.31%
Successional Hardwood Forest	58.49	2.21%
Wet Flatwood	56.12	2.12%
Bottomland Forest	48.65	1.84%
River Floodplain Lake	43.65	1.65%
Depression Marsh	23.71	0.89%
Baygall	5.32	0.20%
Spring—Run Stream	4.47	0.16%
Shell Mound	3.63	0.13%
Sinkhole	1.1	0.04%
Sandhill	0.63	0.02%
Aquatic Cove	0.17	<0.0%
Seepage Stream	0.16	<0.0%
Total Acreage	2,643.90	100%



BLUE SPRING STATE PARK

Draft Unit Management Plan

Executive Summary

Park Accomplishments: 2005 — 2022

Ten-Year Planning Period Objectives

Previous Accomplishments

Since the 2005 approved management plan, significant resource management and protection accomplishments have occurred. Over 2,000 exotic armored catfish have been removed from the spring, and a collaborative partnership with FWC was established to address erosion along the spring run embankments. A volunteer program was also created to monitor manatees during the park's swimming season, between April and November.

Future Objectives

Moving forward throughout the next 10 years of this Unit Management Plan, Blue Spring State Park will continue resource management efforts by performing prescribed fire to dependent natural communities, annually treating 10 acres of exotic plant species, and implementing control measures on all exotic fish within the spring run and feral hogs. Natural community restoration will take place on Scrub, Floodplain Marsh, and Scrubby Flatwoods. To enhance the visitor experience, improvements will be made to all use areas including: relocating the park entrance to prevent car stacking and general congestion issues, concession improvements at both the Upper and Lower Day Use Areas, formalizing French Landing with parking spots, a small fishing dock, and upgrading the current boat ramp, and the addition of up to 10 new campsites, a mix of volunteer site, glamping or tent in sites.





BLUE SPRING STATE PARK

Draft Unit Management Plan

Executive Summary

Management Goals & Objectives

Natural Communities Management

Natural Community Restoration

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

Objective: Maintain 450 acres of the park within the optimum fire return interval

With six fire type natural communities including scrubby flatwoods and depression marshes, plans include to burn between 194—398 acres annually.

Objective: Conduct natural community restoration on 10 acres of scrub

Mechanical treatment will be accomplished by roller chopping and mowing scrub to maintain optimal habitat for the Florida Scrub - jay.

Objective: Conduct natural community restoration on 150 acres of Floodplain Marsh

Floodplain Marsh restoration will take place by performing prescribed burring every two to four years and controlling woody vegetation.

Objective: Conduct natural community restoration on 50 acres of Scrubby Flatwood

Scrubby Flatwood restoration will take place in two steps with a combination of mechanical treatment followed by prescribed fire.

Natural Community Improvement

Objective: Conduct natural community improvement on 2 acres of Mesic Hammock / Spring run

Monitoring of the spring run bank will be done twice a year for erosion due to lack of vegetation. Staff will assess where new vegetation is needed to reduce the effects of ongoing erosion along the boardwalk. The park will also continue to work with FWC on a current spring run bank stabilization project.

Objective: Conduct natural community restoration on .17 acres of Aquatic Cave

The park will work with FDEP divers to conduct an initial photographic survey of the graffiti within the spring boil, with the potential of making it an annual survey.



BLUE SPRING STATE PARK

Draft Unit Management Plan

Executive Summary

Management Goals & Objectives

Imperiled Species & Exotics

Imperiled Species Management

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

Objective: Monitor and document 3 selected imperiled animal species

Monitoring protocols will be developed for the imperiled gopher tortoise, Florida scrub-jay, and Florida manatee.

The park provides habitat for 26 imperiled plants and animals including:

- American alligator
- Florida Scrub Jay
- Manatee
- Snowy egret
- Shell mound prickly-pear
- Florida pine snake
- Curtiss's milkweed
- Florida gopher frog

Exotic and Nuisance Species Management

Goal: Remove invasive species from the park and conduct maintenance control.

Objective: Annually treat 10 acres of exotic plant species in the park

An annual work plan will be developed to remove 10 acres of exotics within the park. Blue Spring will work with FWC IPMS to remove the aquatic invasive such as water lettuce and water hyacinth.

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

Control measures will be focused on removing all exotic fish species from the park, including sailfin catfish, blue tilapia, and brown hoplo. Trapping and removal of feral hogs and domestic animals like cats and dogs within the park boundaries will take place in coordination with local animal control services.



BLUE SPRING STATE PARK

Draft Unit Management Plan

Executive Summary

Management Goals & Objectives

Hydrological & Cultural Resources

Hydrological Management

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

Objective: *Assess the park's hydrological restoration needs*

Continued monitoring of river intrusion during the winter months will provide data on manatee distribution within the winter month in the spring –run. This data will be shared with other state and federal agencies.

Objective: *Improve natural conditions and functions to 206 acres of Freshwater Marsh*

Plans to install either a low water crossing or culvert crossing in the floodplain swamp between management zones will allow for improved pedestrian access and vehicle access for park staff.

Cultural Resource Management

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

During this unit management plan, the cultural resource objectives include assessing and evaluating 18 out of 20 cultural resources in the park, completing three Historic Structure Reports, and ensuring all known sites are recorded and updated within the Florida Master Site File. Priority for preservation at two main park structures, the Thursby House and Fatio Road Barn. All currently known locations for cultural resources will be visited and updated every two year. Additionally, all reliable documentation will be compiled for all recorded historic and archeological resources within the park boundary. Some steps include: compiling a history of the Starke family, developing and adopt a Scope of Collections Statement, and adopting a Statement of Interpretation. A structural assessment will be conducted on the Thursby House to determine the need for stabilization. A maintenance plan should be developed to ensure repairs as needed. Lastly, Blue Spring State Park will work with the University of Florida's Archaeological Field School to further research park mounds and middens at three specific locations.



BLUE SPRING STATE PARK

Draft Unit Management Plan

Executive Summary

Management Goals & Objectives

Recreational Use & Infrastructure

Recreation and Facilities Management

Goal: Develop and maintain use areas and support infrastructure

Objective: *Improve 8 use areas*

Lower River Day Area

- Manatee Staging Area
- Capital Improvements
- Environmental Education Building
- Boating Area Improvements

Upper Spring Run Area

- Capital Improvements
- Boardwalk Expansion
- Restroom Renovations

Campground

- Additional Campsites (10)
- Utility Upgrade
- Additional Dump Station

Park Entrance

- Relocate Park Entrance
- Develop Traffic Plan

French Landing

- Develop Master Plan
- Stabilize Park Road
- Boat Ramp & Fishing Dock
- Interpretive Kiosk

Support Area

- Expand Shop Building
- Improve staff access
- Volunteer site or residence
- Relocate Shop Building

Pine Island Trail

- Boardwalk Extension

Parkwide

- Connect infrastructure to local sewer connection



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Introduction

Blue Spring State Park protects over 2,643 acres of natural communities that include a mosaic of hydric hammocks, mesic flatwoods, and mesic hammocks. Home to a first magnitude spring, Blue Spring, provides refuge for hundreds of manatees during the colder winter months in Florida.

Park Interpretation

Interpretation is a mission-based communication process that forges emotional and intellectual connections between the interests of the audience and meanings inherent in the resource. Interpretive themes are the key concepts for communicating the meanings inherent in a Florida State Park. A central park theme is a short, dynamic interpretive statement that reflects the significance of a park by highlighting distinctive features and essential visitor experiences. Each park has primary interpretive themes. These themes serve as a starting point for park staff to plan interpretive and educational content by outlining the main stories of the park's natural and cultural resources. Interpretive themes may change over time with management needs or shifting historical context.

Central Park Theme

Both a hub for aquatic exploration and vital manatee sanctuary. Blue Spring State Park exemplifies the balance between enjoying and protecting our fragile spring.

Primary Interpretive Themes

Wildlife Sanctuary

Although Blue Spring State Park is best known as a haven for record numbers of manatees each winter, it is also home for many of Florida's threatened and endemic species year-round.

Aquatic Recreation

Demonstrating the gorgeousness and fragility of the park's scenery, Blue Spring offers responsible aquatic activities on both and below the water.

History

Once a hustling and bustling fulcrum of steamboat activity, Blue Spring welcomed 19th century tourists and tradesman looking to travel along the St. Johns River.

Interpretive Application

Interpretation is a DRP priority for the inherent value of visitor engagement and as a tool for promoting stewardship and conservation. Interpretation also plays an important role in achieving many other park management objectives.

Non-Personal Interpretation

Interpretive elements which do not require a person to deliver a message (signs, exhibits, brochures, kiosks, etc.).

Personal Interpretation

One person or persons providing interpretation to another person or persons. It can be planned or impromptu.

Purpose and Scope of the Plan

This plan serves as the basic statement of direction for the management of Blue Spring State Park as a unit of Florida's state park system. It identifies the goals, objectives, and actions that guide each aspect of park administration and sets forth the specific measures that will be implemented to meet management objectives. The plan is intended to meet the requirements of Sections 253.034 and 259.032, Florida Statutes, Chapter 18-2, Florida Administrative Code, and is intended to be consistent with the State Lands Management Plan. The plan consists of three interrelated components: The Resource Management Component, the Land Use Component and the Implementation Component. Upon approval, this management plan will replace the 2005 approved plan.

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.

The Land Use Component is the recreational resource allocation plan for the park. Based on considerations such as 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 recommended.

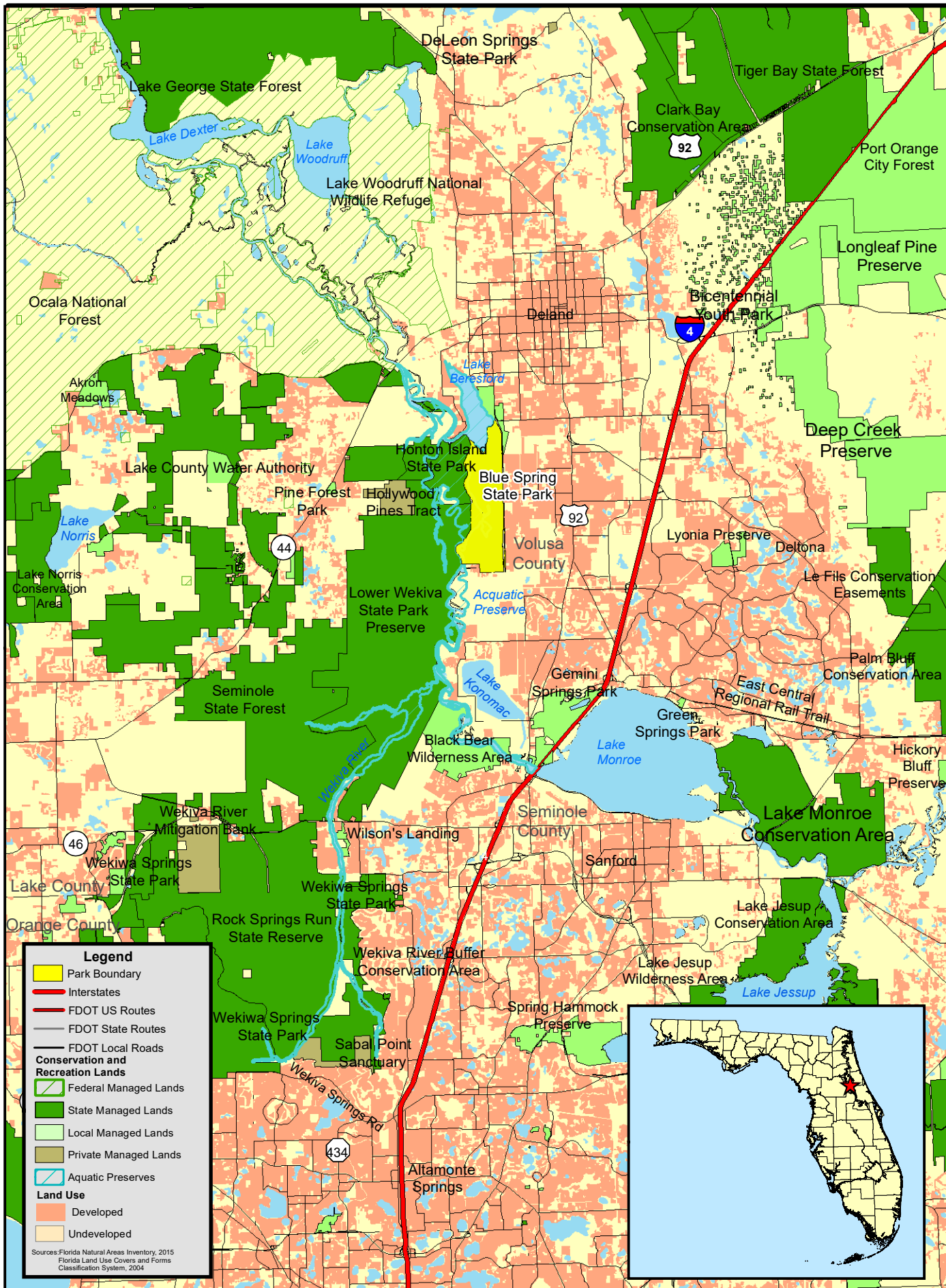
The Implementation Component consolidates the measurable objectives and actions for each of the park's management goals. The implementation schedule and cost estimates includes measures that will be used to evaluate the DRP's implementation progress, timeframes for completion, and estimated costs to 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.

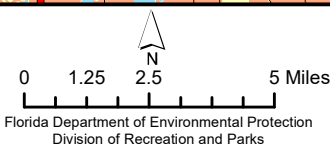
Acquisition History

Blue Spring State Park was initially acquired on August 14, 1972 using funds from the Land Acquisition Trust Fund (LATF). Currently, the park comprises 2,643.9 acres. The Board of Trustees of the Internal Improvement Trust Fund (Trustees) hold fee simple title to the park and on November 21, 1972, the Trustees leased (Lease Number 2622) the property to DRP under a 99-year lease. The current lease will expire on November 20, 2071 (see Appendix 2).

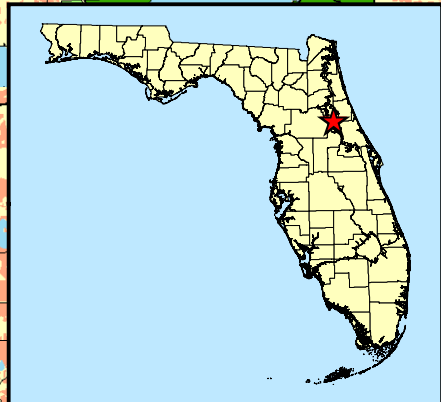
Blue Spring State Park is designated single use to provide public outdoor recreation and conservation. There are no legislative or executive directives that constrain the use of this property. A legal description of the park property can be made available upon request to the Department of Environmental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



BLUE SPRING STATE PARK



VICINITY MAP



Back of Vicinity Map

Unit Classification

Blue Spring State Park is classified as a State Park in the DRP's unit classification system. In the management of a State Park, a balance is sought between the goals of maintaining and enhancing natural conditions and providing various recreational opportunities. Natural resource management activities are aimed at management of natural systems. Development in the park is directed toward providing public access to and within the park, and to providing recreational facilities, in a reasonable balance, that are both convenient and safe. Emphasis is on interpretation on the park's natural, aesthetic, and educational attributes.

General 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
- Restore hydrology to the extent feasible and maintain the restored condition.
- Restore and maintain the natural communities/habitats
- Maintain, improve, or restore imperiled species populations and habitats
- Remove exotic and invasive species and conduct needed maintenance-control
- Protect, preserve and maintain the cultural resources
- Provide public access and recreational opportunities
- Develop and maintain necessary capital facilities and infrastructure

Secondary and Incompatible Uses

In accordance with 253.034(5) F.S., the potential of the park to accommodate secondary management purposes was analyzed. These secondary purposes were considered within the context of DRP's statutory responsibilities and the resource needs and values of the park. This analysis considered the park's natural and cultural resources, management needs, aesthetic values, visitation and visitor experiences. For this park, it was determined that no secondary purposes could be accommodated in a manner that would not interfere with the primary purpose of resource-based outdoor recreation and conservation.

DRP has determined that uses such as, water resource development projects, water supply projects, stormwater management projects, linear facilities and sustainable agriculture and forestry (other than those forest management activities specifically identified in this plan) would not be consistent with this plan or the management purposes of the park and should be discouraged.

In accordance with 253.034(5) F.S. 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.

Contract Services

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

Public Participation

DRP provided an opportunity for public input by conducting an Advisory Group Public meeting to present the draft management plan to the public. This meeting was held on June 21, 2022. Meeting notices were published in the Florida Administrative Register, [6/10/2022, 48/113], 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).

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.

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.

Other Designations

Blue Spring State Park is not within an Area of Critical State Concern as defined in Section 380.05, Florida Statutes, and it is not presently under study for such designation. The park is a component of the Florida Greenways and Trails System, administered by the Department's Office of Greenways and Trails.

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 adjacent to the Wekiva River Aquatic Preserve designated under the Florida Aquatic Preserve Act of 1975 (Section 258.35, Florida Statutes).

Resiliency Planning

Climate-related shocks and stressors present new challenges to the Florida Park Service mission of providing resource-based recreation while preserving, interpreting, and restoring natural and cultural resources.

Parks will adapt to climate threats with prescriptive strategies to minimize and manage the impacts of more severe storms and droughts, sea-level rise, invasive organisms, and other emerging environmental disturbances. Resilience strategies will be incorporated in all park plans and resource management decisions.

RESOURCE MANAGEMENT COMPONENT

The DRP has implemented resource management programs for the perpetual preservation of representative examples of the state's significant natural and cultural resources. This component of the plan describes the natural and cultural resources of the park and identifies the methods that will be used to manage them.

The DRP's resource management philosophy is guided by the principles of natural systems management. Primary emphasis is placed on restoring and maintaining 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 can be accommodated on a case-by-case basis and should be compatible with the maintenance of natural processes.

The DRP's management goal for cultural resources is to preserve sites and objects that represent Florida's cultural periods, significant historic events, or persons contributing to the history of Florida. This goal often entails active measures to stabilize, reconstruct, restore, or rehabilitate cultural resources. Appropriate public use of cultural resources will be considered according to the sensitivity of the resources.

Park units are often components of larger ecosystems, and their proper management can be affected by conditions that occur beyond park boundaries. Ecosystem management is implemented through an evaluation program that assesses resource conditions, refines management activities, and reviews development permit applications.

The entire park is divided into management zones that delineate areas on the ground that are used to coordinate management activities. The shape and size of each zone may be based on natural community type, burn zone, and existing roads or fire breaks.

Measurable objectives and actions have been identified for each of the DRP's management goals for Blue Spring State Park. The goals, objectives, and actions identified in this management plan will serve as the basis for developing annual work plans for the park. The ten-year management plan is based on conditions that exist at the time the plan is developed. The annual work plans provide the flexibility needed to adapt to future conditions as they change during the ten-year planning cycle.

Topography

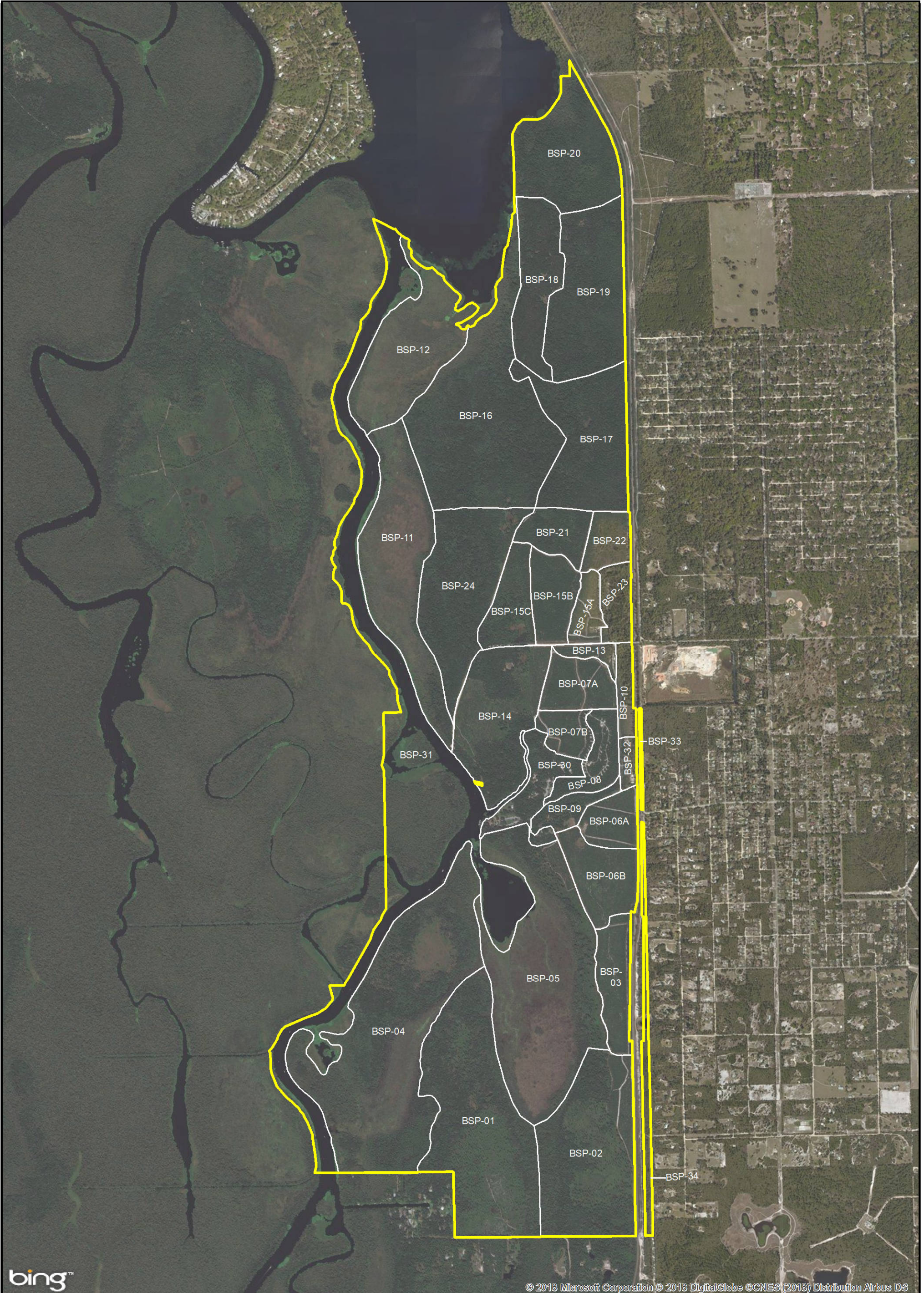
Blue Spring State Park is located within the Atlantic Coastal Lowlands physiographic zone, consisting of mainly level marine terraces. The topography is either leveled terraces or karst with the karst occurring only on the highest terraces.

The park is also a part of two distinctive physiographic subzones: Crescent City-DeLand Ridge and the St. Johns River Valley (Brooks 1982). The north, northeast, and east sections are either located within or adjacent to the higher elevations of the DeLand Ridge. The DeLand Ridge area consists mainly of deep, well-drained sands that are extremely important to aquifer recharge. The highest elevation within the park is 80 feet above mean sea level. From these higher elevations along the DeLand Ridge, the land slopes gently westward towards the St. Johns River floodplain, where the elevation at the river is less than 5 feet above mean sea level (see Topographic Map).

The topographic condition of the park is generally unaltered. There are two barrow pits (circa 1950's) covering about 37 acres located adjacent to the railroad tracks just to the north and south of French Avenue. These pits have gone unused for a number of years, have thick vegetation of various types, and are utilized by wildlife, mainly white-tailed deer, Florida black bear, and gopher tortoises. The Lake Beresford Section of the Volusia County Spring to Spring Trail utilizes a portion of the northern barrow pit. The Blue Spring Avenue Section of the Volusia County Spring to Spring Trail runs along the northern, southern and western sides of the southern barrow pit.

Table 1. Blue Spring State Park Management Zones

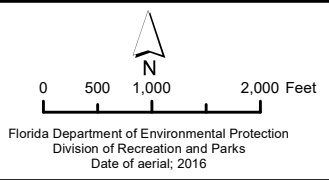
Management Zone	Acreage	Managed with Prescribed Fire	Contains Known Cultural Resources
BSP-2	144.94	Y	N
BSP-3	38.04	Y	N
BSP-4	272.50	Y	Y
BSP-5	221.75	Y	Y
BSP-6a	26.26	Y	Y
BSP-6b	46.95	Y	N
BSP-7a	33.79	Y	N
BSP-7b	20.60	Y	N
BSP-8	28.79	N	N
BSP-9	17.57	N	Y
BSP-10	15.07	Y	N
BSP-11	132.11	Y	Y
BSP-12	102.06	Y	N
BSP-13	9.86	Y	N
BSP-14	100.98	Y	Y
BSP-15a	18.25	Y	N
BSP-15b	35.61	Y	N
BSP-15c	37.06	Y	N
BSP-16	204.14	Y	Y
BSP-17	104.79	Y	N
BSP-18	61.18	N	Y
BSP-19	109.50	Y	N
BSP-20	94.96	Y	Y
BSP-21	29.42	Y	N
BSP-22	22.48	Y	N
BSP-23	22.14	N	N
BSP-24	114.08	Y	Y
BSP-30	37.69	N	Y
BSP-31	356.12	N	N
BSP-32	8.36	N	N
BSP-33	2.10	N	Y
BSP-34	20.3	N	N



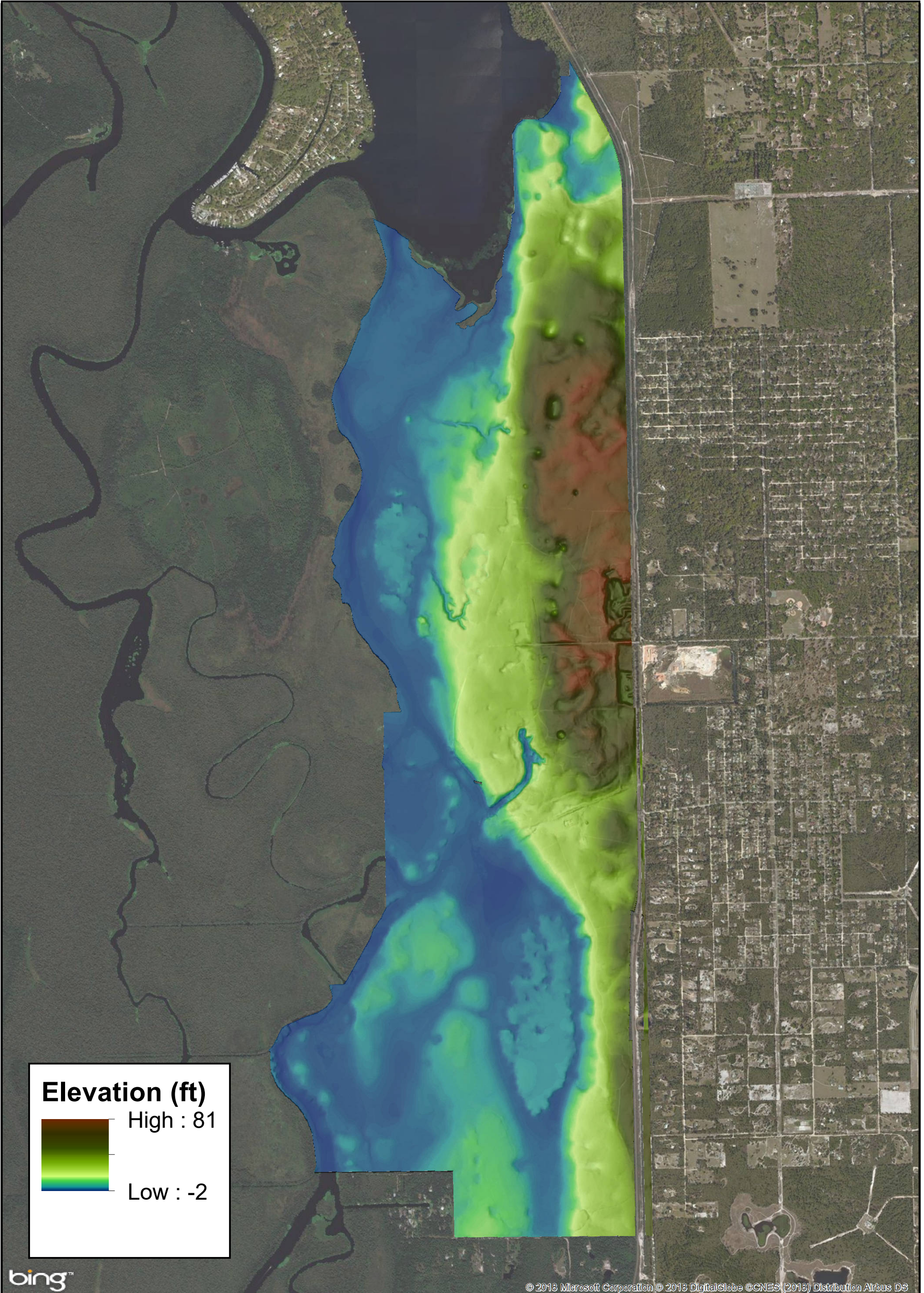
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BLUE SPRING STATE PARK



MANAGEMENT ZONE MAP



Elevation (ft)
High : 81
Low : -2

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BLUE SPRING STATE PARK

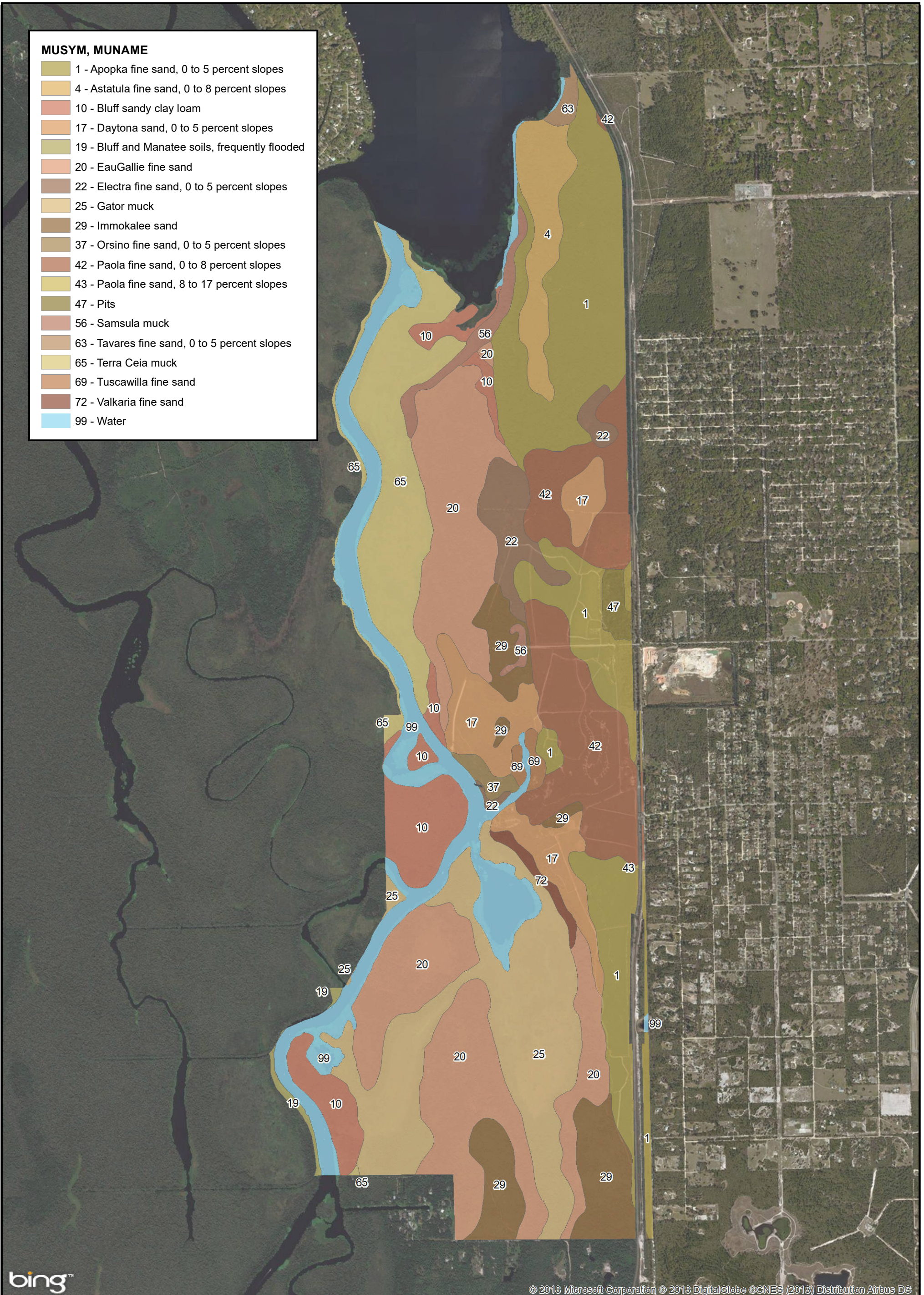
0 500 1,000 2,000 Feet

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

TOPOGRAPHIC MAP

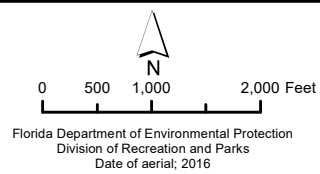
MUSYM, MUNAME

- 1 - Apopka fine sand, 0 to 5 percent slopes
- 4 - Astatula fine sand, 0 to 8 percent slopes
- 10 - Bluff sandy clay loam
- 17 - Daytona sand, 0 to 5 percent slopes
- 19 - Bluff and Manatee soils, frequently flooded
- 20 - EauGallie fine sand
- 22 - Electra fine sand, 0 to 5 percent slopes
- 25 - Gator muck
- 29 - Immokalee sand
- 37 - Orsino fine sand, 0 to 5 percent slopes
- 42 - Paola fine sand, 0 to 8 percent slopes
- 43 - Paola fine sand, 8 to 17 percent slopes
- 47 - Pits
- 56 - Samsula muck
- 63 - Tavares fine sand, 0 to 5 percent slopes
- 65 - Terra Ceia muck
- 69 - Tuscowilla fine sand
- 72 - Valkaria fine sand
- 99 - Water



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BLUE SPRING STATE PARK



SOIL MAP

Geology

The ground surface at Blue Spring State Park is covered with sandy marine sediments of Pleistocene to recent age. The broad, nearly level marine terraces, relic shorelines and karst ridges, which characterize the landscape, are of Pleistocene age.

The geologic material can be divided into an upper sequence of unconsolidated or poorly consolidated deposits and a lower sequence of carbonate rocks. The depth to rock on the eastern ridge of the DeLand Ridge is about 65 feet. The thickness of the clastic deposits varies from 50 to 100 feet under the DeLand Ridge because of differences in local relief. The material is mostly sand, especially at the surface, but it contains discontinuous and interfingering lenses and beds of clay and shell. The carbonate rocks of the lower sequence are limestone and dolomite of middle and upper Eocene age.

The DeLand Ridge is a karst ridge that once formed a shoreline during interglacial periods when the sea level was much higher than it is today. Evidence of this inundation by seawater can be found within the spring-run at the park. The spring-run contains seashells and prehistoric oyster beds that were laid down under high sea levels.

Soils

There are 17 soil types occurring in Blue Spring State Park. These soil surveys (Volusia County, April 2011) were compiled by the U.S. Department of Agriculture, Natural Resources Conservation Service (NRCS). Management activities will follow generally accepted best management practices to prevent soil erosion and conserve soil and water resources found on site. Addendum 4 includes the park's soils map and contains soil descriptions for all soil types found at the park.

Erosion along the spring-run is minimized because only non-motorized vessels can proceed into the refuge area during non-manatee season. There are, however, three areas of concern within the confines of the spring-run: the slopes surrounding the headspring, the tunneling caused by manatees, and the former canoe storage area located closer to the confluence with the St. Johns River. Erosion at the springhead is due in part to natural runoff of rainwater, wave action from the spring outflow and recreation, visitors climbing up and down the steep banks in unauthorized locations, and other prohibited activities while recreating (i.e. clay mining).

The former canoe storage area at the mouth of the spring-run was the storage area for park-related canoes. The high usage of the area caused substantial erosion. In 2009, the park moved the concession's canoes and kayaks to an area near the boat beach. This is also the current canoe and kayak launch for the public visiting the park. Disturbance to the former canoe beach has been greatly reduced and erosion has decreased.

The current location of the rental canoes and kayaks is the other source of erosion and bank disturbance. The storage area and launch are showing some signs of erosion due to increased traffic. The canoe concession put down carpeting in the launch area. This has helped reduce erosion potential and will have to be maintained to remain effective. Paddling rentals are popular at the park, which causes impacts throughout the year.

Located to the south of the park's canoe and kayak concession is an area that is being denuded of vegetation by beaching boats. This area continues to become larger and more impacted as the boat traffic increases. The area is highly utilized on weekends and

holidays. Wave action along the shoreline has increased from propeller usage. Boats tie off to shoreline trees and have broken branches and trees. Occasionally a boat will ram into a tree, damaging the tree in the process. The installation of a floating boat dock in the area of the boat beach would substantially reduce the impacts of erosion.

Native plantings will be added along the spring-run as necessary to prevent or slow erosion. Prioritization will be to those areas lacking native vegetation recruitment. In these areas, the park will augment with native plants suitable to that natural community.

Minerals

There are no known minerals of commercial value located at Blue Spring State Park.

Hydrology

Blue Spring State Park is located in and adjacent to the St. Johns River basin. The park is bounded to the west by the St. Johns River for the majority of its boundary and to the east by three parcels of land along the western boundary of the river.

Volusia Blue Spring is the largest single-spring on the St. Johns River. The spring and spring-run have been included in the Florida Natural Features Program. The water discharged from the spring comes primarily from rainfall within the springshed. The Volusia Blue Spring springshed is approximately 130 square miles in size and includes the urban areas of DeLand, DeBary, Lake Helen, Orange City, and Deltona.

Blue Spring is a circular spring pool with a conical depression and measures 135 feet north to south and 105 feet east to west with steep sandy banks that rise 15-20 feet above water level (Scott 2004). The spring-run also has steep sandy banks, flows south, and west approximately 2,198 feet to the St. Johns River through dense hardwood and palm forest (Scott 2004, Wetlands Solution Inc. 2009). The spring-run varies from 70 to 100 feet in width and is banded by steep wooded slopes except for the lower southeast bank where the terrain flattens considerably. Flow of the spring is impeded by river backwater during high stages of the St. Johns River, which is typically highest when rainfall has occurred south of the park.

The spring was mapped in 2003 by the Cambrian Foundation. The map is on display at the springhead observation platform. The Cambrian Foundation is a not-for-profit company located in Central Florida which conducts and assists aquatic research, provides educational outreach, participates in aquatic restoration activities, and participates in underwater exploratory expeditions. A project of the foundation is the Florida Springs Project, involving the surveying and mapping of numerous submerged caves.

The level of spring output is of great concern as it relates to manatees and the maintenance of natural systems. A growing number of manatees inhabit the middle part of the St. Johns River and its tributaries. They rely on Volusia Blue Spring as their primary winter refuge. Because the temperature of the St. Johns River can drop into the 40°F-50°F range, manatees must come into the warmer spring water to prevent hypothermia. The average discharge for years 1932-1974, as measured by the United States Geological Survey (USGS), was 162 cubic feet per second (cfs), and this average is classified as historic flow (German 2008). Ideally, spring flow should be maintained as close to the historic level as possible in order to minimize cold river water intrusions and

to maintain the spring-run as a manatee refuge. Any water withdrawals that would significantly lower spring output should be treated as a threat to manatee survival.

In 1998, the USGS in conjunction with the St. Johns River Water Management District (SJRWMD) established a flow meter in the spring-run to monitor flow rates. In addition, park personnel monitor upstream river water intrusion daily during manatee season.

River water intrusion refers to the darker, more acidic waters of the St. Johns River creeping inward into the clear waters of the spring. If the volume of water coming from the spring vent decreases, water from the St. Johns River will intrude toward the spring vent. If this happens during manatee season, there is less room for the manatees to shelter from the cold river water in the warmer waters of the spring run. River water intrusion is also a concern for water quality along the spring run.

Minimum Flow and Level (MFL) for Volusia Blue Spring and Blue Spring Run has been established by the SJRWMD. For the duration of the MFL, water quantity will be monitored continuously by USGS. Plants (vascular and nonvascular), wildlife (other than manatees), and ecosystem function are monitored for one year every five years by various researchers. Park staff will provide a daily manatee count during the winter season. Hypothermia will be monitored every winter by the Florida Fish and Wildlife Conservation Commission, Fish and Wildlife Research Institute (FWC FWRI). Water quality is monitored quarterly by DEP. Water quality analysis and biological monitoring occurs two to four times a year and includes macro-invertebrate parameters using the stream condition index (SCI), physical-chemical data, algae levels, and bacteria parameters. The information gathered through these efforts is vital to the management of the spring and spring-run (Wetland Solutions, Inc. 2009).

The Blue Spring Minimum Flow Interagency Working Group is a group of governmental and non-profit organizations involved in the MFL process. The group meets annually to discuss projects associated with the MFL, including issues, concerns, and modifications.

In addition to the DEP sampling, Volusia County performs water quality sampling on a monthly basis and makes the data available to all pertinent agencies. The county's focus is on monitoring the bacterial levels to ensure that the spring-run is safe for recreation.

The sodium-chloride concentrations are variable over time. Since 1960, the values have fluctuated between 200 and 600 mg/L. Therefore, the concentrations are high enough at times to consider the water not suitable for drinking water (secondary drinking water is 250 mg/L). The concentrations are also believed to affect the viability of aquatic vegetative communities within the spring-run. The lack of aquatic vegetation, the subsequent lack of indicator macro-invertebrates, and the low dissolved oxygen readings result in the spring receiving a SCI Index reading of impaired.

Hydrological Management Program

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

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. 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, and installing water control structures to manage water levels.

Objective A: Assess the park’s hydrological restoration needs.

- Action 1 Continue the monitoring/recording of the river water intrusion into the spring-run daily during manatee season.
- Action 2 Begin to monitor/record the river water intrusion daily throughout the rest of the year using the manatee count form with transects.

Monitoring the river water intrusion during the winter (manatee) season provides data that helps explain manatee distribution within the spring-run. This data is shared with other state and federal agencies. Monitoring should be expanded throughout the rest of the year to provide additional data on river water intrusion and seasonal fluctuations.

Objective B: Improve natural hydrological conditions and functions to approximately 206 acres of freshwater marsh natural community.

- Action 1 Install 1 low-water or culvert crossing in the floodplain swamp.

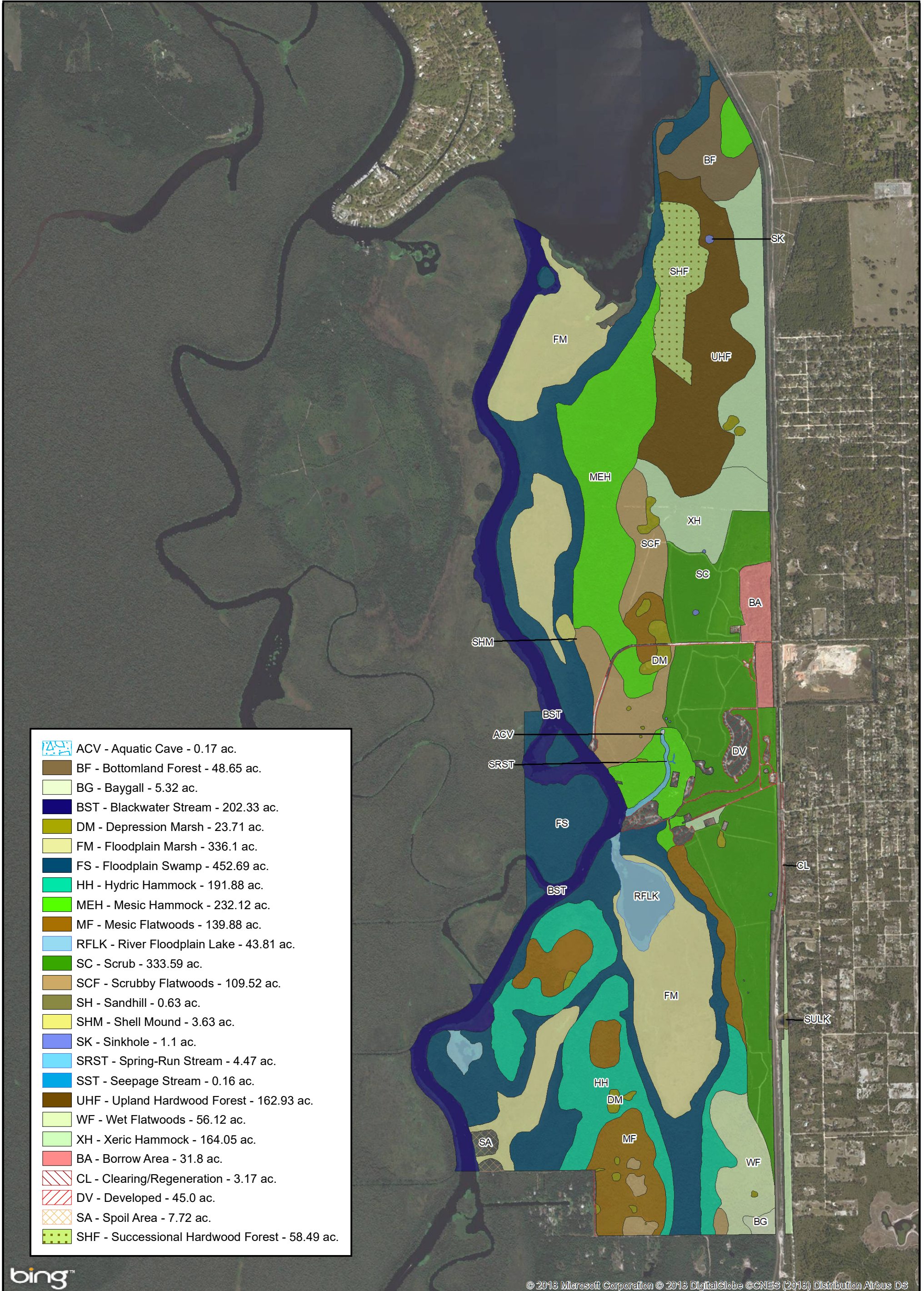
Install one low-water crossing or culvert crossing in the floodplain swamp between management zones 1 & 2 to allow vehicular and pedestrian access on the Pine Island hiking trail through the swamp during high water events. The crossing will allow access during seasonal flooding to the entire southern portion of the park to the west of the crossing. Currently, access is restricted when water levels are high.



























Natural Communities and Altered Landcovers

This section of the management plan describes and assesses each of the natural communities found at the 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. 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. Some physical influences may vary from FNAI’s descriptions for certain natural communities in this plan.

Mesic Flatwoods - 139.88 acres

Description and Assessment: Mesic Flatwoods is found throughout the park in Management Zones 1, 4, 5, 14, and 15C. The community is considered to be in good condition across all zones. Due to fire suppression, hardwood species have invaded the community. Zones 5, 14, and 15C need hardwood thinning (primarily oaks) and a regular fire rotation to reach DFC. Additionally, due to fire suppression, mechanical treatment is necessary in zone 14. Regular fire rotation in zones 1, 4, and 5 is sufficient to bring them to DFC. Exotic plants are infrequent in the mesic flatwoods, except cogon grass and showy rattlebox in the areas close to railroad tracks and coral ardisia in the ecotone between flatwoods and hydric hammock/floodplain swamp.

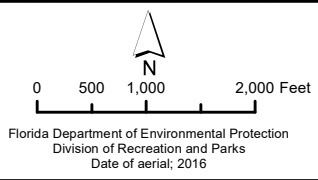


-  ACV - Aquatic Cave - 0.17 ac.
-  BF - Bottomland Forest - 48.65 ac.
-  BG - Baygall - 5.32 ac.
-  BST - Blackwater Stream - 202.33 ac.
-  DM - Depression Marsh - 23.71 ac.
-  FM - Floodplain Marsh - 336.1 ac.
-  FS - Floodplain Swamp - 452.69 ac.
-  HH - Hydric Hammock - 191.88 ac.
-  MEH - Mesic Hammock - 232.12 ac.
-  MF - Mesic Flatwoods - 139.88 ac.
-  RFLK - River Floodplain Lake - 43.81 ac.
-  SC - Scrub - 333.59 ac.
-  SCF - Scrubby Flatwoods - 109.52 ac.
-  SH - Sandhill - 0.63 ac.
-  SHM - Shell Mound - 3.63 ac.
-  SK - Sinkhole - 1.1 ac.
-  SRST - Spring-Run Stream - 4.47 ac.
-  SST - Seepage Stream - 0.16 ac.
-  UHF - Upland Hardwood Forest - 162.93 ac.
-  WF - Wet Flatwoods - 56.12 ac.
-  XH - Xeric Hammock - 164.05 ac.
-  BA - Borrow Area - 31.8 ac.
-  CL - Clearing/Regeneration - 3.17 ac.
-  DV - Developed - 45.0 ac.
-  SA - Spoil Area - 7.72 ac.
-  SHF - Successional Hardwood Forest - 58.49 ac.

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BLUE SPRING STATE PARK



NATURAL COMMUNITIES MAP
EXISTING CONDITIONS

Desired Future Condition: Mesic flatwoods will be characterized by an open canopy of tall slash pines (*Pinus elliottii*), and a dense, low ground layer of low shrubs, grasses and forbes. Saw palmetto (*Serenoa repens*) will be present but not overly dominant. Other shrub species will include, but not be limited to gallberry (*Ilex glabra*), fetterbush (*Lyonia lucida*), runner oak (*Quercus elliottii*), dwarf live oak (*Quercus minima*), shiny blueberry (*Vaccinium myrsinites*), dwarf huckleberry (*Gaylussacia dumosa*), and tarflower (*Bejaria racemosa*). The herbaceous layer will be primarily grasses, including wiregrass (*Aristida stricta* var. *beyrichiana*), panicgrasses (*Dicanthelium* spp.), and broomsedge (*Andropogon* spp.). The Optimal Fire Return Interval for this community is 3-5 years.

General Management Measures: Mesic Flatwoods require a regular fire rotation. Zone 1 has been on a regular rotation, zones 4 and 5 have started a regular rotation, and zones 14 and 15C need to put on a regular rotation once fireline construction and hardwood thinning are completed. Maintenance is all that zone 1 needs to meet DFC. Zones 4 and 5 need to be on a regular fire rotation to thin out the dense hardwoods and remove the accumulated organics resulting from the absence of fire. Zone 14 is an area that needs hardwood thinning, fireline widening (to protect the outparcel), possibly some rollerchopping, and to begin a regular fire rotation. Hardwood thinning and fire should be attempted first, followed by limited rollerchopping, if needed. Zone 15C is a small area that needs a little hardwood thinning, and to begin a regular fire rotation.

Pine Island (zones 1 and 4) is an area of mesic flatwoods found in the southern portion of the park. This area now occurs in two disjunct pieces, separated by hydric hammock and floodplain swamp. Historically, mesic flatwoods occupied much more of the Pine Island acreage that is now predominately hydric hammock. Future restoration needs to target restoring these two pieces to one continuous area of mesic pine flatwoods.

There is one mesic flatwoods area on the Starke Tract. A small area of mesic flatwoods is located in zone 15C, adjacent to scrub, scrubby flatwoods, depression marsh, and mesic hammock. Often overlooked, the area needs minor hardwood thinning and fire to reach DFC. Exotic plant treatment and surveying for new infestations must continue.

Mesic Hammock – 232.12 acres

Description and Assessment: Mesic Hammock is located throughout the park, in Management Zones 5, 9, 14, 16, 20, 24, and 30. The community is in good condition in all zones. Eradication of scattered patches of non-native plants (coral ardisia, camphortree, and Chinese tallow) is needed to obtain DFC. The hammock in zone 20 was once dominated by loblolly pines averaging approximately 100-110 feet tall. In the fall of 2001, the zone was invaded by southern pine beetles, and few live loblollies remain.

Desired Future Condition: Mesic hammock will be a well-developed evergreen hardwood and palm forest. The mostly dense canopy will be dominated by live oak (*Quercus virginiana*) with cabbage palm (*Sabal palmetto*) mixed into the understory. Southern magnolia (*Magnolia grandiflora*) and pignut hickory (*Carya glabra*) will be common components in the subcanopy as well. The shrubby understory will have a diverse density, be of variable heights, and will typically be composed of saw palmetto, beautyberry (*Callicarpa americana*), American holly (*Ilex opaca*), gallberry (*Ilex glabra*) and sparkleberry (*Vaccinium arboreum*). The groundcover will be sparse and patchy, containing panicgrasses (*Panicum* spp.), switchgrass (*Panicum virgatum*), witchgrasses (*Dichanthelium* sp.), sedges, as well as various ferns and forbs. Abundant vines and epiphytes will occur on live oaks and cabbage palms and other subcanopy trees. The hammocks are not considered a fire-adapted community and will be shielded from fire.

General Management Measures: Mesic Hammock is a non-fire type community; however, the addition of firelines in zones 14, 16, and 20 will provide a level of safety in case of a wildfire. Exotic plants are not a major concern at this point, due to regular treatment but monitoring for new infestations and treatment should continue. Replanting loblolly pines in the southern pine beetle-damaged zone 20 may be needed to achieve the DFC.

Scrub – 335.59 acres

Description and assessment: Scrub is located along the eastern side of the park, in Management Zones 2, 3, 5, 6a, 6b, 7a, 7b, 8, 9, 10, 13, 14, 15a, 15b, 15c, 22, 30, and 32. The community is considered to be in good to excellent condition. Due to fire suppression mechanical treatment (mowing, rollerchopping, tree harvesting) followed up with a regular fire rotation is needed in zones 2, 7a, 7b, 8, 9, 15c, 22, 30, and 32. Zones 3, 5, 6a, 6b, 10, 14, 15a, and 15b have already completed the mechanical treatment, so a regular burn rotation is needed to achieve DFC. Eradication of invasive plant infestations, including natal grass and cogon grass, is necessary to achieve DFC.

Desired Future Condition: Within the scrub habitat, the dominant plant species will include sand live oak (*Quercus geminata*), myrtle oak (*Quercus myrtifolia*), Chapman's oak (*Quercus chapmanii*), saw palmetto, and rusty staggerbush (*Lyonia ferruginea*). There will be a mosaic of oak age classes, heights, and species between different scrub patches. There will be scattered openings (>25% percent cover) in the canopy with bare patches of sand that support many grasses and herbs, including bottlebrush threeawn (*Aristida spiciformis*), capillary hairsedge (*Bulbostylis ciliatifolia*), sandyfield beaksedge (*Rhynchospora megalocarpa*), Deckert's pinweed (*Lechea deckertii*), jointweeds (*Polygonella gracilis* and *P. polygama*), and ground lichens (*Cladonia* spp.). There will imperiled and endemic plant species, including scrub wild olive (*Cartrema floridana*), silk bay (*Persea borbonia* var. *humilis*), scrub holly (*Ilex opaca* var. *arenicola*), Curtiss's milkweed (*Asclepias curtissii*), and shell-mound pricklypear (*Opuntia stricta*). Sand pine (*Pinus clausa*) will be present but not be dominant in abundance, less than 10 percent cover, or height (equivalent to one canopy tree per acre). The Optimal Fire Return Interval is typically 4-15 years to achieve a mosaic of burned and unburned areas.

General Management Measures: Scrub requires a regular fire rotation and the Florida scrub-jay has specific habitat requirements. Zones 2, 3, 5, 6a, 6b, 13, and 15a are currently beginning a regular fire rotation that must continue. Zones 7a, 7b, 9, 14, , and 22 need to restart/begin a regular fire rotation. Due to the absence of fire, mechanical treatment should be completed prior to the first burn in all zones with no previous burn history. Zone 15c contains part of a multi-use trail and will require the careful introduction of fire. Zones 8, 30, and 32 contain the campground, use areas, and shop area (respectively). If fire cannot be introduced, mechanical treatment can be used to reduce oak density. Natal grass and cogongrass are found sporadically within most of the zones. Treatment and surveying must be ongoing.

A Master Plan is necessary for the park. The Master Plan will be a blueprint for the future of park. Determining now what may be developed will make completing a scrub management plan much easier. Blue Spring State Park is a very important Florida scrub-jay habitat in western Volusia County. The park is one of two primary Florida scrub-jay habitats in western Volusia County, with the other being Lyonia Preserve in Deltona. It is imperative to restore all scrub habitat and a master plan is vital to accomplish this.

Scrubby Flatwoods – 109.52 acres

Description and assessment: Scrubby Flatwoods is found in Management Zones 1, 2, 14, 15C, 16, 21, and 24. The community is considered to be in fair condition in zones 14, 15C, 16, 21, and 24, and in good condition in zones 1 and 2. Due to past fire suppression, hardwood thinning (primarily oaks) and a regular fire rotation are needed in all zones except 1 and 2 to attain DFC. Zones 1 and 2 need only a routine fire rotation, including summer burns to achieve DFC. Exotic infestations (primarily coral ardisia) are few but require eradication to meet DFC. Scrub endemics (scrub bay, scrub holly, scrub olive, Curtiss' milkweed) can be found in scrubby flatwoods adjacent to scrub.

Desired Future Condition: The dominant tree species of the interior of scrubby flatwoods will be a low density of slash pine. There will be a diverse shrubby understory with patches of bare white sand. A scrub oak sub-canopy will contain a variety of oak age classes and heights across the landscape. Dominant shrubs will include sand live oak, myrtle oak (*Quercus myrtifolia*), Chapman's oak, saw palmetto, rusty staggerbush, shiny lyonia (*Lyonia fruticosa*), and tarflower (*Bejaria racemosa*). Cover by herbaceous species will vary between low to moderately dense. The Optimal Fire Return Interval for this community will 5-15 years following initial mechanical treatment.

General Management Measures: Scrubby flatwoods requires a regular fire rotation. Only zones 1 and 2 are currently in a regular fire rotation. Prior to the introduction of fire, one fireline must be created and 2 must be improved in zone 16. Due to the absence of fire, hardwood thinning should be completed prior to the first burn in all zones (except zones 1 and 2). Exotic plants are not a major issue at this point, however monitoring for new infestations should continue. Due to the community's proximity to scrub, scrubby flatwoods can be utilized by the Florida scrub-jay as secondary habitat. Canopy hardwood density should be low within the zones adjacent to scrub to reduce the number of predator perches available. A regular fire return interval will support the establishment of scrub endemic listed plant species.

Shell Mound - 3.63 acres

Description and assessment: Shell mounds occur in zones 4, 14, 16, 18, 20, 24, and 30. The community is considered to be in good condition due to the lack of deterioration since park acquisition. Erosion is a concern for most due to proximity to wave action from the St. Johns River. There are signs of previous looting at a couple of sites, however no signs of looting are current. Invasive exotic plant infestations are sporadic, minimal, and need to be eradicated to achieve DFC.

Desired Future Condition: This community type is the result of human activities instead of natural and physical processes. Shell mounds are hills of varying size made up of snail shells (apple and banded mystery) discarded by Native Americans. The soils will be circumneutral to slightly alkaline, contain minimal organic material, and are very well drained. The shell mound will be undisturbed and support a variety of hardwood trees and shrubs which include live oak, cabbage palm, red cedar (*Juniperus virginiana*), and red mulberry (*Morus rubra*). Areas where there is evidence of more recent human disturbance (i.e. illegal pits dug by artifact collectors) will be repaired or improved to protect the integrity of the mound. Invasive exotic plant species will be minimal.

General Management Measures: Shell mounds require little direct management. Little is known about most of the mounds (including size), therefore a formal survey is necessary. Erosion should be monitored, as well as routine checks for signs of current looting. Minimizing human disturbance and access will maintain the sites in DFC. Surveys, treatment of exotics and monitoring for new infestations are required to keep the shell mound community in maintenance condition.

Sinkhole – 1.1 acres

Description and Assessment: Numerous sinkholes occur in the park, in zones 6b, 7b, 15b, 17, 19, 21, 24, and 30. Other sinkholes are likely on park property; however, they have not been located and mapped. The community is considered to be in good condition overall due to the lack of deterioration (erosion) overall. Zones 6b, 7b, 15b, and 24 are either in fire rotation or planned to have a fire rotation started, pending mechanical treatment. Fire may eliminate any canopy within the sinkholes in those zones; however mechanical treatment will avoid the sinkholes in order to preserve the interior canopy. The sinkholes in Zones 17 and 19 are located in upland hardwood forest, a non-fire type community. Zone 21 is located in xeric hammock, currently a fire-influenced community whose DFC is scrub. A park goal is to restore the xeric hammock in Zone 21 to scrub. Restoration efforts in Zone 21 will be cautious around the sinkhole in order to protect the integrity of the natural community. Additionally, erosion is a concern in 21 due to the presence of a multi-use trail (opened in 2011). Zone 30 is a developed area (recreational use area), a non-fire type community.

Desired Future Condition: This community is the result of an underground collapse that results in a cylindrical or conical depression with sand walls. Without a direct connection to the aquifer, the sinkholes in the park will rarely contain standing water. The vegetation of sinkholes will mirror the scrub or hammock habitat surrounding the sinkhole. The dominant canopy vegetation in either scrub or hammock will be oak (*Quercus* sp.). Subcanopy vegetation, if present, will mirror the surrounding vegetation. The moister microclimate, due to being buffered by the lower elevation and a tree canopy, will only be altered by fire. Human impact will be minimal. Deterioration will be limited to natural erosion.

General Management Measures: Sinkholes require little direct management. Mechanical treatment will avoid the sinkholes, and erosion should be monitored for. In areas where erosion is likely (Zone 21), steps should be taken to minimize erosion. The park is currently working with trail volunteers to stabilize that portion of the trail in Zone 21 where erosion is occurring and to minimize any future erosion. Minimizing human disturbance and access will maintain the sites in good condition. Exotic plants are found sporadically (including cogon grass and coral ardisia). Surveys, treatment of exotics and monitoring for new infestations are required to keep this community in maintenance.

Upland Hardwood Forest – 162.93 acres

Description and Assessment: This community is located on the Starke Tract, in zones 16, 17, 19, and 20. The community is considered to be in good condition. The community connects a xeric community (scrub) with a hydric community (hydric hammock). The community in zone 16 is found on a steep slope. Exotic plants, primarily coral ardisia and camphortree, are found in all zones. Eradication is needed to attain DFC.

Desired Future Condition: Mature, closed canopy hardwood forest occurring on slopes with generally mesic conditions. Overstory tree species will consist of southern magnolia, sweetgum (*Liquidambar styraciflua*), live oak (*Quercus virginiana*), and laurel oak (*Quercus laurifolia*). Understory species will include trees and shrubs such as American holly, pignut hickory (*Carya glabra*), red bay (*Persea borbonia*), blueberry/huckleberry (*Vaccinium sp.*), and beautyberry. Ground cover is shade tolerant herbaceous species.

General Management Measures: Upland Hardwood Forest is a non-fire type community that requires little direct management. Coral ardisia and camphortree are now found only sporadically due to intense herbicide treatments. Surveys, treatment of exotics and monitoring for new infestations are required to keep the community in maintenance.

Wet Flatwoods - 53.12 acres

Description and Assessment: This fire type community is located in the southern portion of the park in zone 2. The community is considered to be in good condition. The community is in a good fire rotation. Due to the restoration of adjacent scrub, the hydrology of the wet flatwoods has been improved. Heavy rain events will flood the baygall drainage and cause standing water within the wet flatwoods. Exotic plants, including cogon grass and showy rattlebox, are found along the eastern edge of the zone. Eradication of the invasive exotics is needed to attain the DFC.

Desired Future Condition: The dominant pines will be slash pine and pond pine. Cypress (*Taxodium sp.*) may reach the canopy sporadically along the community edge adjacent to floodplain swamp. The canopy will be open, with pines being widely scattered and of variable age classes. Native herbaceous cover will be dense. Ferns will be the dominant groundcover, especially post fire. Terrestrial orchids will be present and abundant along the community edge adjacent to the floodplain forest and along the baygall drainage. The dominant shrub will be saw palmetto. Other shrubs will include fetterbush, gallberry, swamp bay (*Persea palustris*), and wax myrtle (*Myrica cerifera*). Shrub density and height will be increased adjacent to the baygall drainage. The soil has a high organic material content. The Optimal Fire Return Interval for this community is 2-4 years.

General Management Measures: Wet Flatwoods requires routine fire when the vegetation is dry enough to carry fire but must contain enough soil moisture to prevent a duff fire. Cogon grass and showy rattlebox are found sporadically along the eastern edge adjacent to the hiking trail and railroad tracks. Surveys, treatment of exotics and monitoring for new infestations are required to keep this community in maintenance condition.

Xeric Hammock - 164.05 acres

Description and assessment: This fire influenced community was previously scrub and scrubby flatwoods that has experienced severe fire exclusion but is considered to be in good condition overall. Zones containing this community are 9, 16, 17, 19, 20, 21, 24, 32, 33, and 34. Some areas within this community may be restorable back to either scrub or scrubby flatwoods. Historical aerials and surveys will determine if restoration is possible. If restoration is possible, then a restoration plan will be developed for those areas. Management Zones 9, 30, and 32 are xeric hammock, but also include developed areas (shop, settling ponds, and use areas). Management Zone 33 and 34 are developed as Part of the Volusia County Spring to Spring Trail. Exotic plants, including cogon grass and coral ardisia, are found along the edges of the zones. Eradication of the invasive non-natives is needed to achieve DFC.

Desired Future Condition: Considered a late successional stage of scrub, xeric hammock occurs in small isolated patches on excessively well drained soils. Vegetation will consist of a low closed canopy dominated by live oak which provides shady conditions. Plant species will also include sand live oak, Chapman's oak, and laurel oak. Sand pine will also be a minor component. Understory of species will include saw palmetto, fetterbush, myrtle oak, yaupon holly (*Ilex vomitoria*), and shiny blueberry (*Vaccinium mysinites*). A sparse groundcover layer of wiregrass and other herbaceous species will either be a minor component or absent. A continuous leaf litter layer will be present. Invasive non-native species will be a minor component or absent.

General Management Measures: Xeric Hammock requires little direct maintenance, unless restoration to scrub/scrubby flatwoods is desired. Cogon grass and coral ardisia are found sporadically along the edges. Surveys, treatment of exotics and monitoring for new infestations are required to keep the Xeric Hammock community in maintenance condition. A determination regarding whether certain zones can be restored to scrub or scrubby flatwoods will be made during the scrub management plan process.

Baygall - 5.32 acres

Description and Assessment: The baygall is located in zone 2, south of the hiking trail. This community is considered to be in fair condition. Fire is appropriately infrequent. Hydrology has been altered by residential development to the east and south, however upland seepage into the baygall still occurs and needs to continue in order to keep the soil appropriately hydrated. Air potato, cogon grass, and Japanese climbing fern are the invasive non-native species of concern, as they have appeared on the eastern edge of the baygall adjacent to the railroad tracks. Their eradication is vital to attaining DFC since the plants can negatively alter hydrology and fire effects. The air potato beetle, a bio control, has dispersed into the baygall and is negatively affecting the air potato.

Desired Future Condition: Baygall will consist of a wet densely forested, peat filled depression near the base of a slope (i.e. railroad tracks). Seepage from the adjacent uplands (scrub) will maintain saturated conditions. Drainage into adjacent wetlands (wet flatwoods, floodplain swamp, and floodplain marsh) will provide occasional saturated conditions. Medium to tall trees will consist of sweetbay, loblolly bay (*Gordonia lasianthus*), and swamp bay. Sparse pond pines will also exist. A thick understory will consist of gallberry, fetterbush, dahoon (*Ilex cassine*), and red maple. Saw palmetto will be present in the understory, but not dominant. Climbing vines such as greenbriar (*Smilax* spp.) and muscadine grape (*Vitis* spp.) will be abundant. The dominant baygall species are fire intolerant, resulting in an Optimal Fire Return Interval of 25-100 years. Fires from adjacent communities will be allowed to enter the baygall ecotone, keeping in mind the problems associated with peat fires. Invasive plants will be minor to absent.

General Management Measures: The baygall requires little direct management. Hydrology should be monitored to ensure that the area is receiving the upland drainage that the community requires. The mesic flatwoods immediately adjacent to the baygall are overgrown due to fire suppression. The safe reintroduction of fire to the mesic flatwoods and imbedded baygall will require the mechanical treatment (hardwood thinning) of the flatwoods prior to the burn. This will lower the intensity and impact of the fire on the baygall. Invasive non-native plants are located on the baygall's eastern side (air potato, cogon grass, and Japanese climbing fern). Surveys, treatment of exotics (including the air potato beetle) and monitoring for new infestations are required to keep the baygall community in maintenance condition.

Bottomland Forest – 48.65 acres

Description and assessment: It is located in zone 20. The community is a non-fire community and is considered to be in good condition. Hydrology has likely been unaffected due to proximity to Lake Beresford. Periodic flooding is necessary to keep the soil adequately hydrated for the hydrophilic vegetation. Coral ardisia and wild taro are the two invasive non-native species of concern. Eradication of the non-native species is necessary to achieve DFC.

Desired Future Condition: Bottomland forest is a low lying, mesic to hydric community prone to periodic flooding. Vegetation will consist of a mature closed canopy of deciduous and evergreen trees. The overstory will consist of species such as sweetgum, sweetbay, loblolly bay (*Gordonia lasianthus*), water oak (*Quercus nigra*), live oak, and loblolly pine (*Pinus taeda*). Red maple, cabbage palm, and bald cypress (*Taxodium distichum*) will also be present, but not dominant. Understory will be a mixture of open to dense areas. Understory species will include wax myrtle, dwarf palmetto (*Sabal minor*), and swamp dogwood (*Cornus foemina*). Saw palmetto will be present along the edge of the community. Presence of groundcover will be sparse and patchy, consisting of witchgrass (*Dicanthelium* sp.) and various sedges (*Carex* spp.).

General Management Measures: The bottomland forest requires little direct management. Hydrology should be monitored to ensure that the area is receiving the soil saturation that the vegetation requires. The mesic hammock to the south and east is in good condition and is a non-fire type community, thus decreasing the likelihood of fire entering the forest. Exotic plants, coral ardisia and wild taro, are found on the eastern side of the forest. Surveys, treatment of exotics and monitoring for new infestations are required to keep the bottomland forest community in maintenance condition. Infestations to the north (Volusia County Lake Beresford Park) must also be treated and monitored to prevent any further spread south into park property.

Depression Marsh – 23.71 acres

Description and assessment: The depression marshes are located in zones 1, 2, 4, 6b, 14, 15c, 16, 17, 19, and 24. The community is considered to be in fair (zones 14, 16, 17, 19, and 24) to good condition (zones 1, 2, 4, and 6b). Those in good condition are surrounded by upland communities in a fire rotation. Those in fair condition are surrounded by upland communities outside a fire rotation. Fire should be frequent and fire return interval of the depression marsh will be determined by the surrounding upland natural community. The hydrology is rainfall dependent. Trees ring most of the marshes and are affecting hydroperiod. On French Avenue the erosion and runoff has added silt to the ponds on either side of the road (zones 14 and 15c).

Desired Future Condition: The depression marsh will contain low emergent herbaceous and shrub species which will be dominant over most of the area and include open vistas. Trees (i.e. Cypress) 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; frequently the soil surface will be visible through the vegetation when the community is not inundated. Dominant vegetation in the depression marsh will include sand cordgrass (*Spartina bakeri*), maidencane (*Panicum hemitomon*), panic grasses (*Panicum* spp.), cutgrass (*Leersia* sp.), bluestems (*Andropogon* sp.), buttonbush (*Cephalanthus occidentalis*), St. John's wort (*Hypericum fasciculatum*), and coastalplain willow (*Salix caroliniana*). Pickerelweed (*Pontederia cordata*) and arrowheads (*Sagittaria*

sp.) will be present in marshes of sufficient depth and hydroperiod. The Optimal Fire Return Interval for this community is 2-10 years depending on fire frequency of adjacent communities (scrub, scrubby flatwoods, wet flatwoods, or mesic flatwoods). A tree free buffer will surround each marsh to lengthen the hydroperiod. An extended hydroperiod will benefit listed amphibians, including the gopher frog.

General Management Measures: The depression marshes require frequent fire. If the surrounding uplands are on a regular fire rotation, then the contained marshes will be as well (zones 1, 2, 4, and 6b). The community is considered to be in fair (zones 14, 16, 17, 19, and 24) to good condition (zones 1, 2, 4, and 6b). Zones 14 and 24 will need mechanical treatment before a fire will spread through the entire zone. Zones 16, 17, and 19 will need fire lines and mechanical treatment prior to the initial fire. The erosion and silting-in on French Avenue should continue to be monitored. DRP staff will work with Volusia County in an effort to have French Avenue paved, ideally with a culvert under the road to connect the two wetlands. Tree removal around the perimeter of most of the marshes is necessary to increase the hydroperiod. Exotic plants are found infrequently (Chinese tallow), but surveys, treatment of exotics and monitoring for new infestations are required to keep the depression marsh community in maintenance condition. Gopher frog surveys should be conducted annually to determine the enhancement needs of the depression marshes.

Floodplain Marsh – 336.1 acres

Description and assessment: The floodplain marshes are located in zones 4, 5, 11, and 12. The community is considered to be in fair condition. Fire should be frequent, and fire rotation is determined by the surrounding upland natural community. The hydrology, like the St. Johns River, is rainfall dependent. All marshes are being encroached by woody plants, due to lack of fire and drought. This encroaching woody plants include coastal plain willow (*Salix caroliniana*), buttonbush (*Cephalanthus occidentalis*), red maple (*Acer rubrum*) and wax myrtle (*Myrica cerifera*).

Desired Future Condition: Floodplain marsh will be characterized as emergent low herbaceous and shrub species which are dominant over most of the area, and there is an open vista. Trees (including cypress, red maple, and sweetgum) will be few and if present, will occur primarily either in the deeper portions of the community or along the community perimeter. There will be little accumulation of dead grassy fuels due to frequent burning; one should often see the soil surface through the vegetation when the community is not inundated. Dominant vegetation in floodplain marsh will include sand cordgrass, sawgrass (*Cladium jamaicense*), maidencane, panicgrasses, cutgrass, pickerelweed, arrowheads, and St. John's wort. Buttonbush (*Cephalanthus occidentalis*) and coastal plain willow (*Salix caroliniana*) will be present along the perimeter and in scattered small clusters. The Optimal Fire Return Interval for this community is 2-10 years depending on fire frequency of the adjacent communities.

General Management Measures: The floodplain marshes require frequent fire. If the surrounding uplands are on a regular fire rotation, then the contained marshes will be as well. In areas where the surrounding communities are either not in rotation or are non-fire type, aerial ignition should be considered. All zones need enhancement work (mechanical and chemical treatment) to reduce the influence of fire suppression and hardwood encroachment. Enhancement projects will begin in 2014 with zones 4 and 5 to determine the effectiveness of herbicides and fire on the encroaching hardwoods. Exotic plants are not currently an issue, but monitoring must continue to limit new infestations.

Floodplain Swamp - 452. 69 acres

Description and Assessment: Floodplain swamp is located along the park's western boundary with the St. Johns River in Management zones 4, 5, 11, 12, 16, 18, 24, 20, and 31. Additionally, floodplain swamp comprises the eastern boundary of parcels the park manages on the western side of the St. Johns River in Management Zone 31. Floodplain swamp is also found inland in zones 1 and 2, which lie south of the river floodplain lake and freshwater marsh. This community is considered to be in good condition. Despite timbering many decades ago, numerous cypress trees are present. Wild taro occurs in scattered patches of varying sizes along the banks of the St. Johns among the cypress knees. Chemical treatment has occurred and must continue to keep the infestations in a managed phase. Paragrass has also invaded the area adjacent to the river and is in need of chemical treatment. Coral ardisia is found scattered in the interior of the swamp and has been chemically treated. Erosion is minimal, except in the lower use area (Zone 5) where the current boat beach is located.

Desired Future Condition: Floodplain swamp will be a frequently flooded community in low lying areas along the St. Johns River. Soils will consist of a mixture of sand, organics, and alluvial materials. The closed canopy will typically be dominated by bald cypress but commonly includes tupelo species (*Nyssa* spp.) as well as water hickory (*Carya aquatica*), sweetgum, cabbage palm, and red maple. Trees bases are typically buttressed. Understory and groundcover will typically be sparse, containing immature cabbage palms, witchgrasses and woodoats (*Chasmanthium* sp.).

General Management Measures: Floodplain swamp requires little direct management. The hydroperiod is the major factor affecting the health of the system. Monitoring, both direct and indirect, should continue with a focus on changes in water quality, water levels, and water withdrawals. Erosion should continue to be monitored. The boat beach will continue to have significant erosion as long as boats are allowed to beach. A dock will be necessary to accommodate the boats, while minimizing erosion. Surveying and chemical treatment on non-native plants (including wild taro, coral ardisia, and paragrass) must continue to keep the infestations from spreading.

Hydric Hammock - 191. 88 acres

Description and assessment: The hydric hammock is located in zones 1, 2, 4, and 5; this community is considered to be in good condition. Fire should be infrequent. Fire rotation will be determined by the surrounding upland natural community, with fire normally only approaching the edges of the hammock. The hydrology is rainfall and river stage dependent. Exotic plants, predominantly camphor and coral ardisia, are found sporadically. Feral hogs (*Sus scrofa*) are found rooting in the hammock.

Desired Future Condition: Hydric hammock will be characterized by a closed canopy, evergreen hardwood and palm forest with a variable understory dominated by immature palms and sparse to moderate ground cover of grasses and ferns. Typical canopy species will include laurel oak, cabbage palm, live oak, sweetbay, swamp tupelo (*Nyssa sylvatica biflora*), American elm (*Ulmus americana*), and red maple. Soils will be poorly drained but only occasionally flooded. Hydric hammock should occasionally burn by allowing fires to burn across ecotones from fires originating in the adjacent natural communities.

General Management Measures: The hydric hammock requires little direct management. Infrequent fire encroaching on the edges from the adjacent uplands may be beneficial.

Exotic plants, camphor and coral ardisia, are found in a patchy distribution and should be treated. Surveys, treatment of exotics and monitoring for new infestations are required to keep the hydric hammock community in maintenance condition.

River Floodplain Lake - 43.81 acres

Description and assessment: The river floodplain lakes are located in zone 31. They are referred to as lagoons. This natural community is considered to be in good condition. This is not a fire-type community. The hydrology is rainfall and river stage dependent. The water quality and quantity of the St. Johns River will affect the lagoons. Exotic plants are found along the edges. The lagoons are utilized by the Florida manatee (*Trichechus manatus latirostris*) during times of high water.

Desired Future Condition: River floodplain lake community will be characterized as shallow open-water zones, with floating and submerged aquatic plants, which are surrounded by floodplain swamp. Although water levels may fluctuate substantially, they will be permanent water bodies. Water flow will generally be non-existent to very slow moving. Existing vegetation will include American white waterlily (*Nymphaea odorata*), yellow waterlily (*Nymphaea mexicana*), spatterdock (*Nuphar advena*), duckweed (*Lemna* sp.), coontail (*Ceratophyllum demersum*), watermilfoil (*Heterophyllum* sp.), bladderwort (*Utricularia* sp.), cattail (*Typha* sp.), maidencane, and American cupscale (*Sacciolepis striata*). Substrates will be variable and comprised of variable amounts of peat, sand, and alluvial clay. The water column for the lake will be highly tannic with a moderate mineral content. Floodplain lake waters will be circumneutral, moderately hard water with high mineral content. Disturbance in adjacent uplands that may result in an increase in sedimentation will be minimized.

General Management Measures: The river floodplain lakes require little direct management. Cooperation with SJRWMD should continue dealing with the water quality and quantity of the river. Exotic plants are present in this community. Park staff will continue to cooperate with FWC and US Army Corps of Engineers (USACE) regarding their herbicide and bio-control application of these exotic plants. Monitoring for new infestations are required to keep the river floodplain lake community in maintenance.

Sandhill Upland Lake – 0.63 acres

Description and assessment: Half of the sandhill upland lake is located in zone 34. The other half was recently acquired by Volusia County. The lake is located on the eastern side of the railroad tracks, adjacent to a residential area and a powerline easement. This community is considered to be in poor condition. The lake is partially located in a parcel separated from the main park by railroad tracks and a powerline easement. Due to the limited size (long and narrow) and access to this parcel, it is considered to be unmanageable. The area is too small to be secured and too close to residential areas to manage the scrub properly with prescribed fire. Additionally, this area receives heavy off-road vehicle usage. The hydrology of the lake is rainfall dependent. Exotic plants are currently not an issue. Both floating and emergent aquatic vegetation is minimal. There is sawgrass and sand cordgrass along a portion of the shore. This area is utilized by Volusia County for a portion of the County's Spring to Spring paved multi-use trail.

Desired Future Condition: Sandhill upland lake will be a shallow sandy-bottomed lake formed in a shallow depression within the scrub upland community. Water levels may fluctuate dramatically, including completely drying up during extreme droughts. Typical

vegetation will include emergent, submerged aquatic plants and transitional species along the shoreline. Species include water lilies, cattails, sawgrass, sand cordgrass (*Spartina bakeri*), pickerelweed, meadow beauty (*Rhexia* spp.), St. John's wort, yellowed-eyed grass (*Xyris* spp.), hatpins (*Syngonanthus flavidulus*), and spikerushes (*Eleocharis* spp.). Impacts such as altered water table or disturbances in adjacent uplands that would cause artificial erosion and an increase in turbidity will be minimized.

General Management Measures: The sandhill upland lake receives little direct management, partially because the park only owns and manages half of the lake. Water quality in the lake should be monitored. The lake will benefit from the future county trail by decreasing erosion and disturbance. The trail will also consume the majority of the upland habitat (scrub) in the parcel. Exotic plants will be monitored for and treated as part of the county's management agreement.

Blackwater Stream – 202.33 acres

Description and Assessment: The north-flowing blackwater stream is located in zone 31. It is referred to as the St. Johns River. The community is considered to be in good condition. This is not a fire-type community. The hydrology is rainfall and spring discharge dependent. Water quality and quantity of Volusia Blue Spring will affect the river, especially downstream. Exotic plants are found along the edges (alligatorweed, wild taro, Peruvian primrose willow, water lettuce, Cuban bulrush, and water hyacinth). This area is the home of a population of Florida manatees (*Trichechus manatus latirostris*) throughout the year.

Desired Future Condition: Blackwater stream will be a perennial watercourse 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 will include American white waterlily, yellow waterlily, spatterdock, duckweed, coontail, watermilfoil (*Heterophyllum* sp.), smartweeds (*Polygonum* spp.), American cupscale, maidencane, and sedges will occur but will be limited in areas by steep banks and dramatic seasonal fluctuations in water levels. Disturbance and alterations to the river and adjacent natural communities will be minimized, if possible.

General Management Measures: The blackwater stream requires little direct management. Cooperation with SJRWMD should continue dealing with the water quality and quantity of the river. Exotic plants are present in this community. Park staff will continue to cooperate with FWC and USACE regarding their herbicide and bio-control application of these exotic plants. Surveys, treatment of exotics and monitoring for new infestations are required to keep the blackwater stream community in good condition.

Seepage Stream – 0.16 acres

Description and assessment: The seepage stream is located in zone 30. It is referred to as the Blue Spring Run Side Creek. The community is considered to be in good condition. This is not a fire-type community. The hydrology is rainfall and seepage dependent. Water quality and quantity of the seepage stream is affected by the surrounding upland communities and will affect the spring-run. Exotic plants are found along the edges (coral ardisia, citrus, and Caesar's weed). Hog rooting is occasionally seen along the edges.

Desired Future Condition: A seepage stream is a narrow, relatively short intermittent stream formed by percolating water from adjacent uplands. It is sheltered by a dense overstory of broad-leaved hardwoods which block out much of the sunlight. The flora within the seepage stream is relatively depauperate, but will include buttonbush, filamentous algae, ferns and liverworts growing in clumps at the stream edge. Water color will be clear to slightly colored, with a slow variable flow rate and fairly constant temperature. The stream will dry up during extreme drought. Bottom substrate is mucky.

General Management Measures: The seepage stream requires little direct management. Cooperation with DEP should continue regarding water quality. Surveys, treatment of exotics and monitoring for new infestations are required to keep the seepage stream community in good condition. Feral hog removal will minimize ground disturbance.

Spring-run stream – 4.47 acres

Description and assessment: The spring-run stream is located in zone 31. It is referred to as Blue Spring Run. Blue Spring is a 1st magnitude spring. The associated spring-run stream is approximately 0.4 miles long before joining the St. Johns River. The community is considered to be in good condition. This is not a fire-type community. The hydrology is rainfall and spring discharge dependent. Water quality and quantity of the single spring and seepage stream will affect the spring-run. Exotic plants are occasionally found along the edges (alligatorweed, wild taro, water lettuce, and water hyacinth). This area is the winter refuge of a population of Florida manatees (*Trichechus manatus latirostris*). The spring-run is relatively devoid of vegetation partially due to manatees eating the available vegetation during the winter months. The stream is also home to two endemic snails, the pygmy siltsnail (*Floridobia parva*) and Blue Spring hydrobe (*Aphaostracon asthenes*). Exotic fish are commonly found within the run (including blue tilapia (*Oreochromis aureus*), triploid grass carp (*Ctenopharyngodon idella*), pacu (*Colossoma* sp), and vermiculated sailfin catfish (*Pterygoplichthys disjunctivus*).

Desired Future Condition: Perennial water course which derives all of its water from a limestone artesian opening from the underground aquifer. The waters will be cool, clear, and slightly alkaline. These factors allow for optimal sunlight penetration and minimal environmental fluctuations which promote plant and algae growth. Areas of high flow will typically have bare limestone or sandy bottoms while organic materials will concentrate around fallen trees and limbs and slow-moving pools. Typical vegetation will include eel grass (*Valisneria americana*), spatterdock, southern naiad (*Najas guadalupensis*), pondweeds (*Potamogeton* spp.), false indigo (*Amorpha fruticosa*), and buttonbush.

General Management Measures: The spring-run stream requires little direct management. Cooperation with SJRWMD, DEP, USGS, and Volusia County should continue regarding the water quality and quantity of the spring-run. Increasing nitrate concentrations may adversely affect the aquatic ecosystem in the spring and spring-run and therefore continued research and monitoring is needed. Exotic plants are present but minor and are a winter food source for the manatees. Surveys for exotics and monitoring for new infestations are required to keep the spring-run stream community in good condition. Exotic fish are common. Research and removal of the species needs to continue. Stream bank erosion from manatees and humans is seen throughout this area and must be monitored. The edge of the spring boil has some erosion problems due to people climbing up and down the steep banks.

Aquatic Cave – 0.17 acres

Description and assessment: The aquatic cave, Volusia Blue Spring, is located at the northern end of Blue Spring Run in Management Zone 31. The entire cave system is submerged. The community is considered to be in fair condition. Algae are present throughout the cave system attached to the limestone. The amount of algae has increase in the past decade due to increased nutrient loading in the water. The limestone has been defaced by divers in recent years with etched words and symbols. Water clarity varies between crystal clear and very cloudy.

Desired Future Condition: Aquatic caves are cavities below the ground surface in karst areas. This cave system contains only aquatic caves. Due to limited light and a lack of dissolved oxygen, vegetation is sparse with algae being the dominant type. Fauna is minimal, and restricted to species capable of metabolizing sulfur, or extracting oxygen from at or above the water surface.

General Management Measures: The aquatic cave requires little direct management. The hydrology, both water quantity and quality, is the major factor affecting the health of the system. Park staff will continue to cooperate with SJRWMD, DEP, and Volusia County on water quality and quantity monitoring. Park staff will additionally collect visitor observations about cave and water conditions to assist in gauging management decisions. The defacing of the limestone should be monitored and steps taken to stop this disturbance. Park staff will continue to cooperate with local dive groups to maintain diver safety signs within the cave.

Borrow Area – 31.8 acres

Description and assessment: The two borrow areas (barrow pits) are located north and south of French Avenue adjacent to the railroad tracks in zones 10 and 23. No mining or dumping has happened in many years. These borrow areas contain many sporadic exotics (lantana, showy rattlebox, mimosa, climbing fern, and camphor tree) and are the only locations of longleaf pine in the park. Due to a lack of further disturbance, the community is considered to be in good condition. Clean-ups in the northern pit have occurred, removing more recent debris (1980's).

Desired Future Condition: The borrow areas are depressions in the ground, created in the 1950's. Restoration to the previous natural community will not be possible, however the presence of exotic plants and animals will be minimal to absent. Soil will vary from sandy to clay. Native vegetation will be encouraged, and include longleaf pine, live oak, sand live oak, winged sumac, American beautyberry, huckleberry, southern red cedar, cherry laurel, and black cherry. Native grasses will be present, but scattered. Native wildlife (gopher tortoise, white-tailed deer, and FL black bear) are commonly found in both areas and will continue to be encouraged. Trash will be minimal.

General Management Measures: Restoration of the borrow areas is unlikely, therefore the borrow areas within the park will be managed to minimize the effect of the areas on adjacent natural areas. Priority invasive plant species (Florida Exotic Pest Plant Council (FLEPPC) Category I and II species) will be removed from all borrow areas. Other management measures include proper management guidelines that are compatible with prescribed fire management in adjacent natural areas. The removal of trash and non-FLEPPC listed exotic plants will continue, as will be listed species monitor.

Clearing/regeneration – 3.17 acres

Description and Assessment: The clearings are located east of the railroad tracks in zones 33 and 34. Located adjacent to a powerline easement, the clearings contain sandy soil and scattered herbaceous plants and grasses. Both zones have a history of previous disturbance. An old bottled water plant and the installation of both the railroad track and power lines have greatly altered a historically scrubby area. The clearings do contain sporadic exotics (rosenatal grass, kudzu, and cogon grass). Zone 33 is considered to be in poor condition due to consistent illegal dumping. Zone 34 is considered to be in good condition, due to a lack of routine disturbance. Portions of both zones are developed as part of the Volusia County Spring to Spring Trail.

Desired Future Condition: While this altered community will not be restored back to a natural community, exotic invasive species will either have a minimal presence or be absent. Impacts will be minimized to prevent erosion and further disturbance to the cultural resource.

General Management Measures: Restoration of the clearings back to scrub is unlikely, however The Spring to Spring paved trail has improved access to the area making exotic plant treatment/survey easier to complete. The clearings within the park will be managed to minimize the effect of the area on adjacent natural areas. Priority invasive plant species (FLEPPC Category I and II species) will be removed from the clearings. Non-historic trash and non FLEPPC listed exotic plants will continual to be removed.

Developed – 45 acres

Description and assessment: The developed areas are located in zones 6a, 7b, 8, 13, 15a, 30, and 32. The community is considered to be in good condition. This is not a fire-type community. Exotic plants are found sporadically, such as cogon grass, torpedo grass, lantana, and air potato. The parking lots, concessions buildings, campgrounds, cabin area, shop complex, residences, water treatment facilities, use areas (including the Thursby house), and administrative office fall into this category. The area around the spring-run and boil receives a great deal of public use, and as such is subject to erosion. This has been reduced by the addition of a boardwalk. High use in both picnic areas has caused the grass under the oak trees to die. Erosion is a problem in the picnic area near the spring-run since it sits on a slope. Rainwater runoff causes soil to wash out of this area. Erosion continues to persist at both the canoe launch and the area where boats beach south of the fishing pier. Both areas need to addressed and stabilized, paying particular attention the areas containing cultural resources. Exotic animal species (feral cats, hogs, and nine-banded armadillos) are occasionally present.

Desired Future Condition: The developed areas in the park include the use areas, ranger station, administration, shop complex, ranger residences, campgrounds, cabin area, and water treatment facilities. These areas are essential to the visitor services side of the park. These are will remain an altered community and will minimize disturbance on the surrounding natural communities. Exotic species will be minimally present or absent.

General Management Measures: The developed areas within the park will be managed to minimize the effect of the developed areas on adjacent natural areas. The developed areas require some direct management and cooperation with SJRWMD, DEP, USGS, and Volusia County regarding the water quality and quantity of the spring-run (as affected by runoff and erosion). Erosion must be monitored and stabilization plans developed for the

spring-run banks and the paddle boat launch and boat beach areas. Development plans must consider cultural resources, water quality, erosion, and listed species. Exotic plant and animal species will be removed and continually monitored for new infestations.

Spoil Area – 7.72 acres

Description and assessment: The portion of the St. Johns River adjacent to the park has had historic dredging. The material removed from the river channel was deposited along the river banks. The two dredge spoil areas are located within park boundaries, in the southwestern corner in zone 4. The areas are overgrown with vegetation and are surrounded by fire-suppressed floodplain marsh. Due to difficult access, it is unknown whether exotic plants are located there.

Desired Future Condition: These areas will remain intact and will be managed as an altered community. Exotic species will be either absent or minimally present.

General Management Measures: Restoration of the areas is unlikely, however the floodplain marsh surrounding the areas will be enhanced with the removal of encroaching hardwoods through an FWC AHRES multi-year project. The spoil areas within the park will be managed to minimize the effect of the area on adjacent natural areas. Exotic plant and animal species (including FLEPPC Category I and II plant species) will be surveyed and removed from the areas, if access allows.

Successional Hardwood Forest – 58.49 acres

Description and assessment: The successional hardwood forest is located on the Stark Tract adjacent to Lake Beresford in zone 18. The area is referred to as the relic orange grove. The grove has existed since the mid 1800's. It is unknown what natural community existed prior to the grove. However, it is suspected to have been either scrub or sandhill and shell midden. The grove was one of the first groves in the area and is potentially extremely important as a cultural resource. As a disturbed area located along the shore of Lake Beresford, there is recreational potential. The area is composed of numerous laurel oaks and a few remnant citrus trees. Understory is minimal with scattered herbaceous plants, vines, and grasses. Exotic plants (coral ardisia, Caesar's weed, camphortree, common bamboo, wild taro, lantana, citrus and mimosa) are found scattered throughout the grove, an indication of prior inhabitation. Feral hogs are commonly found in the grove, rooting for acorns.

Desired Future Condition: The significance of the relic orange grove will be determined, culturally, recreationally, and ecologically. The information will guide the future of the relic grove. Until then, the area will be maintained as an altered community. Exotic species will be absent or minimally present. Known cultural resources will be monitored and protected. The area will continue to be dominated by numerous laurel oaks and remnant citrus. Sub-canopy and groundcover vegetation will be minimal.

General Management Measures: Restoration of the relic grove has not been decided. Numerous cultural resources are located within the grove and more are likely to be found during a much-needed comprehensive survey. Until the decision on how to process is made, the grove will be managed as a successional hardwood forest. A non-fire type community, the grove will be managed to minimize the effect of the area on adjacent natural areas. Exotic plant and animal species will be removed from the area in a method minimizing any further impact to cultural sites.

Natural Communities Management

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

The DRP practices natural systems management. In most cases, this entails returning fire to its natural role in fire-dependent natural communities. Other methods to implement this goal include large-scale restoration projects as well as smaller scale natural communities' improvements.

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, and prescribed fire reduces wildfire hazards by reducing these 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 A: Within 10 years, have 450 acres of the park maintained within the optimum fire return interval.

- Action 1 Develop/update annual burn plan
- Action 2 Manage fire dependent communities by burning between 194 - 398 acres annually.
- Action 3 Pursue installation/widening of 1 mile of firebreaks on the Starke Tract.

Many natural communities in Florida are pyrogenic, they require periodic fire to maintain proper function with the appropriate diversity of native plants and animals. In lieu of natural fire (lightning strikes), prescribed fire is used to maintain proper function and diversity. An annual burn plan prioritizes zones and guides the park on when to burn and under what conditions for ecosystem maintenance. Firelines keep fire in the area of interest, increasing staff and visitor safety within and outside the park. Table 1 contains a list of all fire-dependent natural communities found within the park, their associated acreage and optimal fire return interval, and the annual target for acres to be burned.

Natural Community	Acres	Optimal Fire Return Interval (Years)
Scrub	334	5-10
Scrubby Flatwoods	110	3-5
Mesic Flatwoods	140	2-4
Wet Flatwoods	56	2-5
Floodplain Marsh	336	2-4
Depression Marsh	18	2-4
Annual Target Acreage	194 – 398	

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.

In order to track fire management activities, the DRP maintains a statewide burn database. The database allows staff to track various aspects of each park's fire management program including individual burn zone histories and fire return intervals, staff training and experience, backlog, etc. The database is also used for annual burn planning which allows the 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.

Of the twenty-one natural communities located in the park, six are fire-type communities. These communities require fire on a particular interval to maintain the optimum conditions necessary to benefit the greatest variety of flora and fauna.

Scrub

The park contains 334 acres of sand pine scrub. There are 210 acres in some stage of restoration. The areas have gone through mechanical treatment to reduce the height and density of the vegetation. Mechanical treatment includes roller-chopping, mowing, tree piling, and tree removal. Scrub restoration began in 1989 and has occurred sporadically until 2008 when projects became more frequent. Most of the mechanical treatments were followed by prescribed fire within a year of mechanical treatment completion. Grants from FWC, USFWS, and the Nature Conservancy (TNC) have funded the mechanical treatments. Due to the catastrophic nature of scrub burning, vegetation must be less than 6 feet in height to safely burn within park boundaries. This requires a more frequent burn rotation. The park is also burning more frequently to reduce the vegetation density and to encourage more open sandy areas.

The remaining 124 acres are in need of mechanical treatment prior to the first prescribed fire. The areas are severely overgrown and are slowly becoming a xeric hammock. However, these areas are important future Florida scrub-jay habitat. The question is not if restoration will take place, but rather when. The areas will provide an important corridor to scrub-jay habitat to the north of the park on Volusia County property. These areas also require mineral firebreaks, with low mowed (15 ft wide) shoulders. Due to the high density of overgrown oaks, mechanical treatment may involve hardwood removal.

Maintained scrub, with vegetation 6 ft in height or less, few canopy trees and numerous open sandy patches will greatly benefit the Florida scrub-jay. The scrub-jay is scrub dependent with strict habitat requirements. As an umbrella species, habitat that benefits the scrub-jay will also benefit numerous additional flora and fauna, including the gopher tortoise, Florida black bear, Curtiss's milkweed, garberia, and indigo snake.

Scrub burning requires dry conditions, a low relative humidity, and a steady wind (~10 mph). These conditions are more likely to occur in the spring; however, burning must not occur during scrub-jay nesting. Timing and wind direction is very important. The park is partially surrounded by residential development, thus restricting the winds

available to burn on. The park is restricted to easterly winds, which will send any smoke towards the river and the state lands to the west.

An area of research would be how to increase the number of open sandy patches. Can fire accomplish this alone or is chemical (herbicide) application necessary. If chemicals are necessary, which chemical is best? What is the application rate? Is there a preferred season for application? What is the application frequency?

Scrubby Flatwoods

There are 110 acres of scrubby flatwoods located within the park boundaries. Most of the acreage is currently in a prescribed fire rotation but some that is very fire suppressed with a high density of hardwoods. A majority is in fire rotation due to its location within mesic and hydric flatwoods. Firebreaks have been added to many of the zones containing scrubby flatwoods.

Scrubby flatwoods are located near scrub and supports many of the same animal species as scrub. Even the Florida scrub-jay will include scrubby flatwoods as part of its territory.

Reducing the hardwood canopy and subcanopy will encourage more grasses and herbaceous species. Encroaching hardwood trees from the adjacent wetlands should be reduced or removed by writing burn prescriptions with specific wind speeds and directions to push fire intensity towards the encroaching hardwoods.

Due to its similarity to scrub in plant composition, the fire return interval is similar. However, in scrubby flatwoods there is a higher density of canopy species. Slash pines are common and must be protected with a lower intensity fire to avoid a canopy fire.

Mesic Flatwoods

There are 140 acres of mesic flatwoods within the park boundary. They are found in both the central and south ends of the park. This community is predominately in maintenance condition. The zone with the greatest percentage of mesic flatwoods, 1, has been on a regular burn rotation since the 1990's. Due to a lack of variety in preferable wind directions, fire shadows do exist. Mechanical treatment (chainsaws) has been utilized to reduce the shadows. The rest of the mesic flatwoods are located as a minor portion of other zones. Some of these zones are in maintenance (4), while others require mechanical treatment and/or fire breaks (5, 14, 15c).

Encroaching hardwoods from the adjacent wetlands should be reduced or removed by writing burn prescriptions with specific wind speeds and directions to push fire intensity towards the encroaching hardwoods.

Maintaining the mesic flatwoods in optimum condition is beneficial to white-tailed deer, the Florida black bear, gopher tortoise, and the indigo snake. Having frequent fires and preventing a saw palmetto dominate ground cover will encourage more grasses and herbaceous plants. Wiregrass is an expected plant in this community and requires spring burning for the production of fertile seeds.

Wet Flatwoods

There are 56 acres of wet flatwoods within the park boundary. This community is located in Zone 2, in the southeastern corner of the park. This community is predominately in maintenance condition. The zone has been on a regular burn rotation since the 1990's. A high soil moisture content is required in this zone for a safe effective burn. Due to a lack of variety in preferable wind directions, fire shadows do exist. Mechanical treatment (chainsaws) has been utilized to reduce the shadows.

In optimum condition, the wet flatwoods are beneficial to white-tailed deer, the Florida black bear, and turkey. Frequent fires, with adequate soil moisture to prevent a duff fire, will prevent a saw palmetto dominate ground cover and will encourage more grasses, ferns and herbaceous plants.

Floodplain Marsh

Four zones contain floodplain marsh (4, 5, 11, and 12), accounting for 336 acres in the park. Like in many floodplain marshes, fire has not been routine. The result is the encroachment of hardwood species such as red maple, Carolina willow, etc. When the floodplain marsh is no longer a grass dominated community, the susceptibility to prescribed fire is altered. Not only is ignition is more difficult, but the fire's ability to carry through the zone is hindered.

Freshwater marsh enhancement is a current topic of research. In an attempt to further knowledge of marsh enhancement, the park is cooperating with FWC's Aquatic Habitat Restoration and Enhancement Section (AHRES) on a methodology project to determine the effect of timed herbicide and prescribed fire application on the reduction of unwanted hardwoods and the increase in grasses and herbaceous plant species. It is also possible that the removal of a substantial number of mature hardwoods will alter the water level within the marsh, providing the system with more water for a longer period of time. This is a multi-year project and, if successful, may be replicated at the other marshes at Blue Spring State Park (zones located north of French Avenue).

Once treated, the marshes are meant to have a short burn interval. This encourages grasses and prevents the encroachment of hardwoods. Floodplain marshes are important area for fish, invertebrates, and birds (including the limpkin, little blue heron, snowy egret, and bald eagle).

Aerial burns are the preferred methodology for prescribed fire in this community. This can be an expensive method, but the results are more similar to a natural fire. Due to proximity to forested wetlands, fire breaks are not necessary, as long as the forested wetlands (typically non-fire type communities) contain enough moisture (preferably standing water) to prevent the spread of fire out of the marsh.

Depression Marsh

Depression marshes are located throughout the park in scrubby flatwoods, mesic flatwoods, as well as hydric hammock. The depression marshes encompass 24 acres. Though the fire return interval is short and therefore similar to floodplain marsh, these marshes tend to burn on the same rotation as the uplands around them. Some marshes are located within or adjacent to uplands that are maintenance condition (zones 1, 2, 4, and 6b) and are themselves in good condition. Others are in areas of fire suppressed

uplands (zones 14, 15c, 24) being prepped for their first prescribed fire, and currently include fire breaks. Still others are in fire suppressed uplands lacking fire breaks and any plan for mechanical treatment (zones 16 and 17).

One enhancement for depression marshes is the removal of trees around the perimeter. This will increase the amount and retention of rainfall into the marshes. The longer retention of water will improve the habitat for the wetland plants residing in the marsh. Regular fire will prevent tree growth and may remove some trees. However, if the trees are very tall, safe fire may not be able to remove the necessary trees, at this point mechanical treatment is needed (i.e. chainsaw). This is a continuing project in zone 1, and needs to be started in zones 2, 14, 15c, and 24. The mechanical treatment around the depression marsh in zone 6b has been completed and is currently being maintained through prescribed fire.

Depression marshes provide important feeding and breeding habitat for reptiles (eastern indigo snake), amphibians (gopher frog), and birds (sandhill crane). Routine fire and frequent flooding will also benefit the greatest variety of plants.

Natural Community Restoration

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

Examples that would qualify as natural community restoration, requiring annual restoration plans, include large mitigation projects, large-scale hardwood removal and timbering activities, roller-chopping and other large-scale vegetative modifications. The key concept is that restoration projects will go beyond management activities routinely done as standard operating procedures such as routine mowing, the reintroduction of fire, 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 Scrub, Scrubby Flatwoods, and Floodplain Marsh communities (see Desired Future Conditions Map).

Objective B: Conduct/Continue habitat/natural community restoration activities on approximately 10 acres of Scrub natural community annually.

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| Action 1 | Continue scrub specific management and improvement of the restoration plan. |
| Action 2 | Conduct mechanical treatment through roller chopping and mowing on 10 acres annually to maintain the scrub habitat in an optimal state for the Florida Scrub-jay. |
| Action 3 | Continue to monitor usage of restored scrub by the Florida Scrub-jay to determine effectiveness of restoration for the scrub-jay by conducting point count surveys annually. |

A “healthy” scrub will contain a wide diversity of flora and fauna. The health of this community is maintained through fire. Once the scrub oaks become too tall, they shade out many of the herbaceous and grass species and close in the bare open sand patches. This reduces the floral diversity of the area, followed shortly by a decrease in the wildlife diversity and abundance. A fire at this point will either not carry or will carry in an intensity unsafe for the park property. A restoration and maintenance plan has been created and implemented for the last 10 years at the park that specifies what mechanical treatment techniques are necessary for each management zone in order to return the zones to a condition manageable with fire. The goal is to main the scrub habitat in a variety of early successional stages that favor the scrub-jays while monitoring the population using the Audubon Jay Watch program. The Florida scrub-jay is an umbrella species, meaning that habitat suitable for them will be suitable for other species. Monitoring scrub-jay use and population will aid in determining management success.

Objective C: Conduct habitat/natural community restoration activities on 150 acres of Floodplain Marsh natural community.

- Action 1 Continue to implement the restoration plan in cooperation with FWC AHRES and FWC FWRI.
- Action 2 Prescribe burn the marsh on a 2–4-year fire return interval
- Action 3 Control woody vegetation with herbicide when needed

A “healthy” floodplain marsh will contain a wide diversity of flora, dominated by herbaceous and grass species, and fauna. The health of this community is maintained through fire and hydrology. Fire suppression and altered hydrology has allowed the encroachment of woody vegetation which alters hydroperiod, fire success, and plant diversity. A reduction of the floral diversity is followed shortly by a decrease in the wildlife diversity and abundance. A restoration and maintenance plan has been developed and implemented for the marsh south of the lagoon. Aerial herbiciding, fire, tussocks removal and floating mat removal have all been implemented and monitoring needs (vegetative and listed species) have been established. DEP will continue to work with FWC AHRES on this area and on other areas nearby.

Objective D: Conduct habitat/natural community restoration activities on 50 acres of Scrubby Flatwoods natural community.

- Action 1 Conduct mechanical via mowing and roller-chopping on 50 acres of scrubby flatwoods.

Similar to scrub, scrubby flatwoods is currently fire suppressed in the park. A combination of fire and mechanical treatment will be needed to return the community to a state manageable primarily by fire. Mechanical treatment will lessen the vegetative density of the zone, allowing for fire to better carry through the zone, at a lesser (and safer) intensity. A plan has been created and implemented outlining the mechanical treatment needs of each management zone containing scrubby flatwoods.

Natural Community Improvement

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

Objective E: Conduct natural community/habitat improvement activities on 2 acres of Mesic Hammock/Spring run natural community.

- Action 1 Monitor the spring-run bank adjacent to the boardwalk semi-annually (pre and post swim season (May-September)) for native re-establishment and bank erosion due to lack of vegetation.
- Action 2 Plant additional native vegetation along the boardwalk, as needed, in areas not filling in/areas of erosion.
- Action 3 Continue to work with FWC on phase III of the spring boil bank stabilization.

While erosion is a natural process, human impact has increased the process. The boardwalk was constructed to lessen erosion along the banks of the spring-run but is only effective when the visitors stay on it. However, straying from the boardwalk can cause significant soil and floral damage. Monitoring the damage pre and post swim season will allow the park to post better signage and determine where remediation is necessary. Additionally, as exotic plants are removed from along the boardwalk, monitoring is necessary to see whether natural revegetation is occurring or if plantings are necessary. Significant rain event (including tropical storms) can also hasten erosion, possibly requiring revegetation.

Two phases of the spring run bank stabilization project have been completed by working with the FWC. A good portion of the manatee refuge areas, south of the swim area, was restored in 2021 along with the eastern bank of the spring boil. DEP and FWC funds were combined to complete these projects but a third and final phase is still required on the north and west faces of the boil. DEP will continue to seek funding with the FWC and partners to complete this project.

Objective F: Conduct natural community/habitat improvement activities on 0.17 acres of Aquatic Cave natural community.

- Action 1 Work with DEP divers to conduct an initial photographic survey of the graffiti with the spring boil, with the potential of making it an annual survey.

Due to the simplicity of the spring boil, the park sees a lot of open-water and cave/cavern divers annually. While most dive the spring and leave minimal impact, some choose to leave a more permanent reminder of their visit. This reminder is in the form of words and/or images. Over the years the amount of graffiti has increased significantly. Not only is it aesthetically unpleasing, it can affect the structural integrity of the limestone walls, possibly increasing the rate at which the limestone dissolves. An annual photographic survey will allow the park to better understand the impacts of the graffiti and decide an appropriate management strategy for this resource.

Imperiled Species

Imperiled species are those that are tracked by FNAI as critically imperiled or imperiled; or 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.

The St. Johns River basin is home to a population of Florida manatees (*Trichechus manatus latirostris*), a sub-species of the West Indian manatee (*Trichechus manatus*). An ever-increasing number of the St. Johns population are using the spring-run as their winter home, because the temperature of the St. Johns River becomes too cold (< 68° F) for manatees to reside. They need the warmer water of the spring (72° F) to survive in the winter months. Spring flow must be maintained to protect this important manatee refuge (see discussion in Hydrology section). The spring-run was recognized as an important habitat by the Manatee Sanctuary Act of 1978, which gave legal protection to manatees at Blue Spring and other refuges.

Since the winter of 2007, the park closes the entire spring-run to water activities (swimming, tubing, diving, and paddling) from November 15th through March 15th. The dates may begin sooner and end later depending on manatee presence. Non-manatee related research is reduced during this period; however, manatee research is allowed.

Blue Spring is responsible for important data collection and interpretive efforts. Data collection involves counting the number of manatees within specific transects in the spring-run from the time the manatees arrive in winter until their departure in the spring. During the winter season, interpretive programs are given daily to the visiting public and to school parties and information is disseminated to those who request it. There are idle and slow boating speed zones in place along the St. Johns River directly adjacent to the park boundaries. Starting October 15th and proceeding to April 15th there is a seasonal slow speed zone in effect in this same area. This seasonally slow speed zone requires that boat speeds be reduced to slow speed instead of 25 mph during the winter (manatee season) months. These slower speed zones appear to provide some protection to the Florida manatee and should be maintained.

Along with the current and seasonal speed zone restrictions that are in place, there is also an agreement with the USACE to limit the application of herbicide in known Florida manatee locations adjacent to the park. This agreement is commonly referred to as the "moratorium for herbicide application," and it restricts the USACE from spraying the aquatic vegetation from October 1st through April 1st. The Blue Spring Aquatic Plant Management Working Group was established in 1994 to make the USACE's voluntary prohibition more formally agreed upon by the various governmental agencies and non-profits involved. An aquatic plant management plan was developed by the Working Group in 2010. The working group meets annually to discuss any issues, concerns, and modifications that need to be made to the plan. FWC Invasive Plant Management Section honors this moratorium by removing contractors from October-April.

The Florida mouse (*Podomys floridanus*) has been seen occasionally within the scrub. Known to live in gopher tortoise burrows, the first occurrence of a Florida mouse was the result of a 2003 survey by graduate students from the University of Central Florida performing a small mammal survey. A more detailed survey needs to be conducted to better understand the population densities and locations.

Florida black bears (*Ursus americanus floridanus*) are known to frequent and give birth in the park. The park is located within a wildlife corridor that extends from the Ocala National Forest to the Wekiva and Rock Springs area. The onsite dumpsters are currently bear resistant. Campers are educated with pamphlets and handouts along with verbal instructions when they are checked in on how to deal with the wildlife, mainly bears. If a black bear is deemed a nuisance, then FWC is contacted and a strategy is determined.

Since 2006, the park has participated in Jay Watch, which is a program administered by Audubon Florida Staff and volunteers survey the scrub between June 15th and July 15th each year looking for adults (with and without bands) and newly fledged juveniles. Consistent survey points and methodology allow for measureable data that is shared with FWC and Audubon. The park currently has a stable population of Florida scrub-jays (*Aphelocoma coerulescens*). The park's Florida scrub-jay population is currently estimated to be 8-10 families and a total estimated bird count of 28-47. One difficulty with the population survey and yearly changes is that the majority of the scrub-jays are unbanded. The banding program has been started and needs to continue in order to gather the data needed for a complete census. The population is likely to increase as a result of the scrub enhancement underway. Known to be detrimental to scrub-jays, a feral cat removal program is ongoing, in cooperation with Volusia County Animal Control.

Scrub restoration/enhancement has been ongoing since the 1990's, increasing the area suitable for the scrub-jays. While successful, a scrub management plan should be developed to address various topics associated with maintaining the existing scrub so that scrub-jays continue to utilize these areas. Due to the loss of habitat throughout Florida, protection and restoration/enhancement of scrub is important for the survival of the species. Population studies, along with observation of individual and family interactions, should continue to be monitored on a regular basis. Neighboring scrub-jay populations should also be included in the monitoring efforts along with off-site banding, with land owner permission, to provide dispersal information. Information gathered over the years should be routinely shared with adjacent land owners and all agencies involved with the recovery of the Florida scrub-jay. The scrub habitat within Blue Spring must be managed with a consistent fire regime to maintain premium quality scrub-jay habitat.

The Blue Spring hydrobe (*Aphaostracon asthenes*) and the pygmy siltsnail (*Floridobia parva*) are the only known freshwater snail species unique to Blue Spring, making them Blue Spring endemics. The snails are unique among Florida operculate snails because of their size and very fragile shells (Thompson 1984). These snails have primarily been found in the upper part of the spring run where plants and bottom debris is very sparse (Franz 1982). Any disturbance in the upper area of the spring-run could have a severe impact on the survival of these species. A status survey should be routinely performed and transects established to monitor these fragile species. All management decisions that could negatively impact these species should be preceded by a status survey.

The rarely seen Florida gopher frog (*Lithobates capito*) is listed on the park's animal list, and is known to use gopher tortoise burrows for its home. Gopher tortoise burrows are common, especially in scrub, scrubby flatwoods, and mesic flatwoods. Most easily seen spawning in depression ponds, a comprehensive survey for this frog is needed. The only known occurrence is in the depression marshes on French Avenue. Habitat enhancement through prescribed fire and hardwood removal should benefit this species.

Commonly seen walking along trails and mowed shoulders, the gopher tortoise (*Gopherus polyphemus*) has burrows in scrub, scrubby flatwoods, and mesic flatwoods. They can also be found along the railroad tracks. Important as an umbrella species, many species require the gopher tortoise burrow for shelter (including Florida mice, indigo snakes, Florida pine snake, and eastern diamondback rattlesnakes). Scrub restoration/enhancement will benefit the species by reducing the vegetation density, thus creating more openness for grasses and herbaceous vegetation and making travel easier. Visitor interpretation must continue about their importance, how they differ from aquatic turtles, and why they should not be removed from the park.

There are a number of snakes that occur in the park that are on the imperiled species list. The reclusive eastern indigo (*Drymarchon corais couperi*) has been spotted by occasionally by staff, volunteers, and other agencies. Usually found in the scrub, flatwoods, or along the railroad tracks basking. A comprehensive survey should be done in order to determine their abundance and distribution within the natural communities in the park. Not known from this area, the Mississippi green water snake (*Nerodia cyclopion*) was listed in the previous unit management plan. No other information is available at this time. A comprehensive survey is needed to determine if this species is present. Rarely seen, the Florida pine snake (*Pituophis melanoleucus mugitus*) has been spotted at the park. They are known to coexist with gopher tortoises. A comprehensive survey should be done in order to determine population levels.

The park is home to or provides habitat for a number of wading birds. The limpkin (*Aramus guarauna*), little blue heron (*Egretta caerulea*), snowy egret (*Egretta thula*), and tricolored heron (*Egretta tricolor*) can be seen walking along the St. Johns River in search of food. Occasionally, one can be seen walking the shallows of the spring-run. The white ibis (*Eudocimus albus*) can be seen along the river roosting or hunting.

There are also a number of other birds that live in park or use the area as part of their habitat. Gracefully soaring, the swallow-tailed kite (*Elanoides forficatus*) can be seen either playing or hunting above the river and scrub in the spring and summer. Perching and nesting occurs in the floodplain swamp either along the river or the lagoon in a large pine tree. Listed on the previous plan's animal list, the merlin (*Falco columbarius*) has not been seen on park property in recent years. Whether stopping by, flying over, or nesting on property, the Florida sandhill crane (*Grus canadensis pratensis*) is an occasional sight on property. A rare sight at the park, the wood stork (*Mycteria americana*) has been seen visiting the river or flying overhead. Another rare sight at the park, the brown pelican (*Pelecanus occidentalis*) has been seen visiting the river.

A number of listed imperiled plant species may be found in the park. The Okeechobee gourd (*Curcubita okeechobeensis*) has been found at numerous locations on park property along the shoreline of the St. Johns River (Minno and Minno 1998). These areas are visited as needed by park staff. FWC IPMS is aware of the locations and attempt to keep herbicide away from this vine. Information regarding these locations should also be provided to the USACE to eliminate the possibility of damage by herbicide spraying. Curtiss's milkweed (*Asclepias curtissii*) is located within the scrub. Due to small size and cryptic nature of the plant, it is commonly overlooked. When seen, the plant has been noted; however, a comprehensive survey is needed. Garberia (*Garberia heterophylla*) is also found in the scrub. Most obvious when in bloom, the plant is commonly found in the park. Like the Curtiss's milkweed, a comprehensive survey needed. Angularfruit milkvine (*Gonolobus suberosus*) is most commonly found in more hydric areas, adjacent to the spring-run, floodplain swamp and hydric hammock. In this park, the plant is commonly found in association with shell middens. This plant has been seen in numerous locations. A comprehensive survey (recreational areas in particular) is needed. Shell-mound pricklypear (*Opuntia stricta*) is commonly found within the scrub at the park. This plant has been seen in numerous locations. The giant airplant (*Tillandsia utriculata*) is located along the spring-run. This plant is mostly found nestled in large oaks overhanging the spring-run. Additional plants can also be found along the spring-run in the mesic hammock. The recent appearance of the Mexican bromeliad weevil (*Metamasius callizona*) is cause for concern. Staff should monitor and be trained to recognize infestations in the airplants. Any exotic weevil occurrence should be reported to district biologist. Additional research related to this invasive insect needs to be encouraged.

Table 3. Imperiled Species Inventory

Common and Scientific Name	Imperiled Species Status				Management Actions	Monitoring Level
	FWC	USFWS	FDACS	FNAI		
PLANTS						
Curtiss's milkweed <i>Asclepias curtissii</i>			LE		1,2,6,7	Tier 1
Okeechobee gourd <i>Cucurbita okeechobeensis</i>		LE	LE	G1, S1	2,10	Tier 1
Garberia <i>Garberia heterophylla</i>			LT		1,2,6,7	Tier 1
Angularfruit milkvine <i>Gonolobus suberosus</i>			LT		2,10	Tier 1
Shell mound prickly-pear <i>Opuntia stricta</i>			LT		1,2,6,7	Tier 1
Giant airplant <i>Tillandsia utriculata</i>			LE		10	Tier 1
SNAILS						
Blue Spring hydrobe snail <i>Aphaostracon asthenes</i>				G1, S1	4,12	Tier 2
Pygmy siltsnail <i>Floridobia parva</i>				G1, S1	4,12	Tier 2
AMPHIBIANS						
Florida gopher frog <i>Lithobates capito</i>	SSC			G3G4, S3	1,6,7, 10	Tier 1
REPTILES						
American alligator <i>Alligator mississippiensis</i>		LT (S/A)		G5, S4	13	Tier 1
Eastern indigo snake <i>Drymarchon corais couperi</i>		LT		G4T3, S3	1,6,7, 10,13	Tier 1
Gopher tortoise <i>Gopherus polyphemus</i>	LT	Candidate		G3, S3	1,6,7, 10,13	Tier 2
Mississippi green water snake <i>Nerodia cyclopion</i>				G5, S1	4	Tier 1
Florida pine snake <i>Pituophis melanoleucus mugitus</i>	SSC			G4T3?, S3	1,6,7, 10,13	Tier 1
BIRDS						
Florida Scrub Jay <i>Aphelocoma coerulescens</i>		LE		G3, S3	1,6,7,8, 10,13	Tier 3
Limpkin <i>Aramus guarauna</i>	SSC			G5, S3	4,12,13	Tier 1
Little blue heron <i>Egretta caerulea</i>	SSC			G5, S4	4,13	Tier 1
Snowy egret <i>Egretta thula</i>	SSC			G5, S3	4,13	Tier 1
Tricolored heron <i>Egretta tricolor</i>	SSC			G5, S4	4,13	Tier 1

Table 3. Imperiled Species Inventory						
Common and Scientific Name	Imperiled Species Status				Management Actions	Monitoring Level
	FWC	USFWS	FDACS	FNAI		
Swallow-tailed kite <i>Elanoides forficatus</i>				G5, S2	13	Tier 1
White ibis <i>Eudocimus albus</i>	SSC			G5, S5	4,13	Tier 1
Merlin <i>Falco columbarius</i>				G5, S2		Tier 1
Florida sandhill crane <i>Grus canadensis pratensis</i>	ST			G5T2T 3, S2S3	1	Tier 1
Wood stork <i>Mycteria americana</i>		LE		G4, S2	4	Tier 1
Brown pelican <i>Pelecanus occidentalis</i>	SSC			G4, S3	4	Tier 1
MAMMALS						
Manatee <i>Trichechus manatus</i>		LE		G2, S2	4,10,12 13	Tier 3
Florida black bear <i>Ursus americanus floridanus</i>				G5T2, S2	1,10,13	Tier 1

Management Actions:

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

Monitoring Level:

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

Imperiled Species Management

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

The 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 of natural processes

DRP consults with FWC Imperiled Species Management 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 to inform management of decisions that may have an impact on imperiled species at the park.

Long-term monitoring is 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 provide 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.

Objective A: Expand the a baseline imperiled species occurrence inventory lists for plants and animals.

Better resource management is a result of a baseline imperiled species survey to detect rare and endangered species.. While numerous imperiled plant and animal species have been identified on property, it is highly believed that others have gone undiscovered. This is especially true of the plant species. If the park knows what it contains, it can better manage to preserve it.

Objective B: Monitor and document 3 imperiled animal species in the park.

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| Action 1 | Implement monitoring protocols for the following 3 imperiled animal species (gopher tortoise, Florida Scrub-jay, and Florida manatee) |
| Action 2 | Continue the mapping/distribution/activity monitoring (baseline surveys) for gopher tortoises post prescribed fire. |
| Action 3 | Continue the daily Florida manatee counts/distribution/density during the winter season. Continue to record daily the dark water intrusion from the river. |
| Action 4 | Continue to coordinate with Save the Manatee Club (SMC) on manatee identification during the winter season. |
| Action 5 | Continue to coordinate with FWC and Sea to Shore Alliance on manatee health, rescues, and releases. |
| Action 6 | Continue the mapping/distribution/activity survey of the Florida scrub-jay each summer. |
| Action 7 | Continue to band the Florida Scrub-jay each year. |

The park is home to three umbrella imperiled animal species. By protecting and maintaining habitat for these three species, the park is protecting numerous other floral and faunal species. In order to monitor the success of the habitat management, surveys are conducted on these three species. Management strategies will possibly be altered based on the results of the surveys.

The Florida scrub-jay is monitored every summer (approximately June 15th – July 15th) in a partnership with Audubon Florida and their citizen-scientist program, Jay Watch. The survey is timed to monitor population changes, habitat utilization, and reproductive success. Vegetation surveys will be conducted every other year as part of the survey to monitor vegetation changes and its effect on manatee distribution. This also helps to guide vegetation management. Scrub-jay banding will continue to better track jay movement throughout the year, as well as a more definitive population estimate.

The majority of the St. Johns population of the Florida Manatee visit Blue Spring every winter. Daily counts of manatees within the spring-run are conducted each morning once the river temperature drops enough to consistently bring manatees into the spring-run for warmth. The daily counts provide multiple agencies (USGS, USFWS, SJRWMD, FWC) with spring-run usage (daily, monthly, seasonally) and manatee preference/density along the spring-run. Dark water intrusion (from the river) will be recorded daily during the manatee season as an indicator of the area within the spring-run which is unusable manatee resting space for that day. Save the Manatee Club (SMC) will continue to provide routine individual manatee identification (through unique scar patterns) and adoptee updates. SMC will continue to work with the park to provide end of the season population statistics (monthly manatee attendance, max number seen, number that stayed the winter, max daily count, number of calves). Coordination with SMC for manatee identification will occur as necessary during non-manatee season. The park will continue to work with multiple agencies and non-profits, as needed, to assess manatee health, to remove injured manatees, and to be a manatee release site.

Gopher Tortoises are found in numerous upland habitats at the park. Post-burn surveys are conducted to determine burrow presence/absence, density, condition, and width (a measure of the size of the tortoise currently using the burrow) within a management zone. Baseline surveys are the priority. Additional surveys will be added, as needed.

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 because they have been released from the natural controls of their native range, such as diseases, predatory insects, etc. If left unchecked, invasive exotic plants and animals alter the character, productivity and conservation values of the natural areas they invade.

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

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. Nuisance animals are dealt with on a case-by-case basis in accordance with the DRP's Nuisance and Exotic Animal Removal Standard.

Due to sharing the park boundary with residential development and the St. Johns River, numerous exotic species are found within the park. These species are diverse in structure, density, and placement. Hydric areas (floodplain swamp and hydric hammock) and disturbed areas (use areas, roads, borrow pits, relic grove, and railroad tracks) are the locations for the major infestations. All Category I and II exotic species found and treated within the park are listed below in Table 3.

While numerous species have been identified and treated, coral ardisia is the dominant plant of concern. Typically hiding in hydric areas, the extent of this species' presence was unknown until 2009. Surveying, mapping, and treatment began in 2009/2010. Introduction is believed to have occurred by animal since the prolific bright red berries are edible to wildlife. Additionally, a neighbor landscaped with this species many years ago. Since 2009, large areas have been treated, opening areas up that were approaching monoculture status.

The park has been treating exotic plants for years; however, a more comprehensive survey did not take place until 2009. Since then surveys are more frequent. Park staff and FWC IPMS contractors have treated 416 acres since July 2005.

The park additionally treats exotic species that are currently not listed as either Category I or II species by FLEPPC. These species include: tanglehead (*Heteropogon contortus*), sweet tanglehead (*Heteropogon melanocarpus*), itchgrass (*Rottboellia cochinchinensis*), noyau vine (*Merremia dissecta*), hairy indigo (*Indigofera hirsuta*), trailing indigo (*Indigofera spicata*), common asparagus fern (*Asparagus setaceus*), Turk's turban (*Clerodendrum indicum*), showy rattlebox (*Crotalaria spectabilis*), loquat (*Eriobotrya japonica*), four-o'clock (*Mirabilis jalapa*), and common bamboo (*Bambusa vulgaris*). While not listed by FLEPPC, these species are either easy to keep in maintenance or of concern to the park because of their potential to spread into the natural areas.

Wild taro (*Colocasia esculenta*) is becoming a significant problem throughout the entire St. Johns River system. These plants can be found in swamps as well as along the edges of the river. This species has the ability to dominate an area if not controlled. In conjunction with the Middle St. Johns Aquatic Preserve staff and FWC IPMS, the park and river can benefit from a program designed to eradicate wild taro through spraying and mechanical removal. The park does spray, however not all areas can be reached with park equipment, necessitating assistance from FWC IPMS (i.e. airboats).

Torpedograss (*Panicum repens*) and paragrass (*Urochloa mutica*) occur sporadically along the river's edge. Both need to be controlled by spraying.

Water lettuce and water hyacinth are treated on the St. Johns River by the USACE. Due to the spraying moratorium, USACE only sprays between April 1st and October 1st. FWC IPMS contractors treat, in coordination with USACE, water lettuce, water hyacinth, Cuban bulrush (*Oxycaryum cubense*), and Peruvian primrosewillow. Alligatorweed (*Alternanthera philoxeroides*) is controlled along the river by the introduced bio-control alligatorweed flea beetle (*Agasicles hygrophila*), monitored by FWC IPMS.

As is the case with all isolated areas, domestic animals are deposited along the park's entrance road (French Avenue) and if not monitored regularly can become a severe problem. Although many house pets do not typically propagate in the wild, their free-ranging activities on park lands can have an adverse effect on native species which would normally not have to contend with these additional pressures.

The following exotic animal species have been regularly seen at Blue Spring: the nine-banded armadillo (*Dasypos novemcinctus*), blue tilapia (*Oreochromis aureus*), vermiculated sailfin catfish (*Pterygoplichthys disjunctivus*), pacu (*Colossoma nigripinnis*), triploid grass carp (*Ctenopharyngodon idella*), brown hoplo (*Hoplosternum littorale*), koi (*Cyprinus carpio carpio*), feral cats and dogs, and feral hogs (*Sus scrofa*). Nine-banded armadillos, feral cats and dogs, and feral hogs will be removed following DRP policy whenever a need presents itself. The park cooperates with Volusia County Animal Control to find appropriate placement for cats and dogs. Exotic fish removal occurs monthly (except during the manatee season), in association with Stetson University. The focus is primarily the collection of vermiculated sailfin catfish for Dr. Melissa Gibbs' research. However, other exotic species are collected as the opportunity arises. The removals are permitted through FWC and a report is submitted annually. The removals of the exotic fish and the support of the research must continue. The vermiculated sailfin catfish has been found to have a negative impact on the Florida manatee (Gibbs et. al. 2010), compete with native fish for food, and have the potential to alter water quality (K Work, in progress). Since July 2005, the park has removed 7,851 exotic animals.

The park continues to cooperate with the United States Department of Agriculture (USDA) as a location in the monitoring program for the emerald ash borer (*Agilus planipennis*). Traps are set up and monitored by USDA. The borer is known to travel in contaminated firewood. The park attempts to limit the amount of firewood coming into the park and the Friends of Blue Spring sells pest free firewood at the Ranger Station.

With the St. Johns River adjacent to the park, the American alligator (*Alligator mississippiensis*) is commonly seen. Most abundant in the river, it is common to see at least one in the spring-run. No feeding signs are posted both within the park, as well as at French Landing. However, feeding does occur resulting in some of the gators becoming a nuisance. The park has a permit to relocate those four feet or less in length to a more secluded location within the park boundary. Alligators considered a nuisance, and over four feet in length, will be removed with assistance from FWC. Monitoring for nuisance alligators must continue, especially within the spring-run. Hunting alligators is not allowed within the park boundaries and coordination with FWC must continue to catch poachers.

Raccoons (*Procyon lotor*) and the eastern grey squirrel (*Sciurus carolinensis*) occasionally become nuisance species. This is primarily due to feeding by visitors, despite numerous posted "Do Not Feed Wildlife" signs. Park staff will remove the two species as necessary when deemed a health and safety concern. Removal will follow DRP policy and will be reported monthly.

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, 2011). The table also identifies relative distribution for each species and the management zones in which they are known to occur. An explanation of the codes is provided following the table. For an inventory of all exotic species found within the park, see Addendum X.

Table 4: Inventory of FISC Category I and II Invasive Plant Species			
Common and Scientific Name	FLEPPC Category	Distribution	Management Zone (s)
PLANTS			
Mimosa <i>Albizia julibrissin</i>	I	0	BSP-8, BSP-9, BSP-10, BSP-18, BSP-23, BSP-30
Alligator weed <i>Alternanthera philoxeroides</i>	II	2	BSP-31
Coral ardisia <i>Ardisia crenata</i>	I	2	BSP-2, BSP-5, BSP-14, BSP-16, BSP-17, BSP-18, BSP-19, BSP-20, BSP-23, BSP-24, BSP-30
Orchid tree <i>Bauhinia variegata</i>	I	0	BSP-30
Camphor tree <i>Cinnamomum camphora</i>	I	1	BSP-6B
		2	BSP-4, BSP-8, BSP-13, BSP-14, BSP-16, BSP-18, BSP-19, BSP-23, BSP-30, BSP-33
Wild taro <i>Colocasia esculenta</i>	I	2	BSP-4, BSP-11, BSP-12, BSP-20, BSP-24, BSP-31
Umbrella plant <i>Cyperus involucratus</i>	II	1	BSP-4
Durban crowfootgrass <i>Dactyloctenium aegyptium</i>	II	2	BSP-6A, BSP-8, BSP-9, BSP-10, BSP-13, BSP-15A, BSP-23, BSP-32
Air-potato <i>Dioscorea bulbifera</i>	I	0	BSP-10
		1	BSP-2, BSP-16
		2	BSP-8, BSP-14, BSP-18, BSP-19, BSP-20, BSP-24, BSP-31, BSP-32, BSP-33
Water-hyacinth <i>Eichhornia crassipes</i>	I	2	BSP-31
Hydrilla <i>Hydrilla verticillata</i>	I	0	BSP-31
Cogon grass <i>Imperata cylindrica</i>	I	1	BSP-32, BSP-33
		2	BSP-2 BSP-13, BSP-15B, BSP-15C, BSP-17, BSP-18, BSP-19, BSP-20, BSP-21, BSP-23
Lantana <i>Lantana camara</i>	I	2	BSP-6A, BSP-8, BSP-18, BSP-23, BSP-30, BSP-32
Chinese privet <i>Ligustrum sinense</i>	I	0	BSP-30
Japanese honeysuckle <i>Lonicera japonica</i>	I	2	BSP-23
			BSP-33
Peruvian primrosewillow <i>Ludwigia peruviana</i>	I	2	BSP-2, BSP-31

Table 4: Inventory of FISC Category I and II Invasive Plant Species			
Common and Scientific Name	FLEPPC Category	Distribution	Management Zone (s)
Japanese climbing fern <i>Lygodium japonicum</i>	I	0	BSP-13
		2	BSP-2, BSP-10, BSP-33
Chinaberry <i>Melia azedarach</i>	II	1	BSP-20
		2	BSP-33
Natal grass <i>Melinis repens</i>	I	2	BSP-2, BSP-3, BSP-6A, BSP-6B, BSP-15B, BSP-22, BSP-23
Heavenly bamboo <i>Nandina domestica</i>	I	1	BSP-18
Sword fern <i>Nephrolepis cordifolia</i>	I	1	BSP-13
		2	BSP-14, BSP-18, BSP-30
Guinea grass <i>Panicum maximum</i>	II	1	BSP-13
		1	BSP-30
Torpedo grass <i>Panicum repens</i>	I	1	BSP-6A
		2	BSP-2, BSP-32
		6	BSP-1
Napier grass <i>Pennisetum purpureum</i>	I	2	BSP-23, BSP-33
Golden bamboo <i>Phyllostachys aurea</i>	II	0	BSP-32
Water-lettuce <i>Pistia stratiotes</i>	I	2	BSP-31
Kudzu <i>Pueraria montana var. lobata</i>	I	2	BSP-33
Water spangles <i>Salvinia minima</i>	I	2	BSP-31
Chinese tallow tree <i>Sapium sebiferum</i>	I	0	BSP-7A
		2	BSP-14, BSP-18
		0	BSP-9
Tropical soda apple <i>Solanum viarum</i>	I	1	BSP-31
		2	BSP-17, BSP-19, BSP-22, BSP-23
		2	BSP-2, BSP-4, BSP-14, BSP-16, BSP-18, BSP-20, BSP-30
Caesar's weed <i>Urena lobata</i>	I	2	BSP-2, BSP-4, BSP-14, BSP-16, BSP-18, BSP-20, BSP-30
Para grass <i>Urochloa mutica</i>	I	2	BSP-31
Chinese wisteria <i>Wisteria sinensis</i>	II	0	BSP-30

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 and Nuisance Species Management

Goal: Remove invasive species from the park and conduct maintenance control.

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

Objective A: Annually treat 10 acres of exotic plant species in the park.

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| Action 1 | Annually develop/update exotic plant management work plan. |
| Action 2 | Implement annual work plan by treating <u>10</u> acres in park, annually, and continuing maintenance and follow-up treatments, as needed. |
| Action 3 | Continue cooperation with FWC IPMS on the release of the air-potato beetle as a biocontrol of air-potato when needed. |
| Action 4 | Develop an annual plan with Volusia County Parks and Recreation to control exotic plants found along the Spring to Spring Trail sections on park property. |
| Action 5 | Initiate cooperation with FDOT to control exotic plants found along the railroad right-of-way adjacent to park property. |
| Action 6 | Annually meet with the Blue Spring Interagency Working Group (FFWCC, USACE, USFWS, DEP, SMC, STSA) to update and continue the winter spraying moratorium. |

Natural community management includes the identification, mapping, and removal of non-native plant species. Removal techniques will include mechanical, chemical, and biological. The park will continue to partner with FWC IPMS to acquire herbicides, be included in the annual work plan for invasive plant management, monitor bio-control impacts, and propose upland projects to the Mosquito Coast Working Group.

The park will continue to work with FWC IPMS to manage invasive aquatic plants within the park boundary through inclusion in the FWC IPMS annual plan. The FWC IPMS annual work plan for the management of invasive plants on the St. Johns River will target the following species within park boundaries: water hyacinth, water lettuce, Cuban bulrush, Peruvian primrose willow, Para grass, and wild taro. Treatment will occur during non-manatee season and cease during manatee season (October–April). A multi-agency agreement has been in place for over two decades to enact a treatment moratorium around Blue Spring Run for the benefit of the manatees overwintering in the spring-run as a nearby food source. USACE, who treats water hyacinth and water lettuce in the river, also complies with this moratorium.

The Lake Beresford section of the Volusia County Spring to Spring Trail is an easement on the park property, and is managed by Volusia County. The park will continue to work with the County in the eradication of exotic plant species along the trail. An exotic plant management plan should be developed for the trail, focusing on priorities, control techniques, treatment timing, etc.

Along the eastern boundary is a railroad track managed by the Florida Department of Transportation (FDOT). The shoulders of the tracks are vegetated and contain numerous exotic plant species, some of which have infested park property. Communication with FDOT is necessary to manage the exotic plants found along the tracks, and minimize their spread onto park property.

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

- Action 1 Remove all exotic fish species from the park.
- Action 2 Trap and remove feral hogs as needed.
- Action 3 Trap and remove domestic wildlife such as cats and dogs as needed.

Many exotic animal species introduced to Florida cause significant ecological harm to our natural resources. Removal of these species will occur as needed. The park will also continue to work with researchers to become more knowledgeable about these species and their impact on the park's natural communities. The park will continue to work with a local university to research and remove exotic fish from Blue Spring Run, including but not limited to the vermiculated sailfin catfish, blue tilapia, triploid grass carp, pacu, and brown hoplo. The park will continue to coordinate with FWC Fisheries (through an annual removal permit). Feral hog removal will occur as needed, working with the District office to use USDA for sensitive area removals. Dogs and cats will be trapped, in coordination with Volusia County Animal Control, as the opportunities arise.

Infested area means the total coverage of exotic plants within the gross acreage. DRP sets goals and tracks treatment of gross and infested acreage treatment via the Natural Resources Tracking System.

Cultural Resources

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 cultural resources. For the purposes of this plan, significant cultural resource 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).

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.

Desired Future Condition

All significant cultural resources 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. According to the Florida Master Site File (FMSF), the present boundaries of Blue Spring State Park encompass twenty recorded sites, including archeological sites, historic buildings, a historic railroad, residential remnant areas, and a historic indigo vat.

Prehistoric and Historic Archaeological Sites

Description: Archaeological investigations to date have identified a number of extensive, potentially related sites, and have revealed the likelihood that the park contains many more sites than are presently documented.

Due to proximity to the St. Johns River, the majority of recorded cultural resources in the park are pre-contact period aboriginal sites (shell middens/mounds) which dot the bank of the river. Eleven of the recorded cultural resources are prehistoric sites. Two of these prehistoric shell middens (8VO43 and 8VO7229) also contain historic components associated with the Blue Spring Railroad (8VO5272) and Thursby House (8VO5162). These prehistoric cultural resources represent approximately 6000 years of continuous use by people who deliberately constructed shell structures, and contain significant information about their diet, mortuary traditions, crafts, natural resource use, cultivation, trade, and settlement patterns, among other things. Evidence for this comes from the thorough surveying of three middens which show St. Johns Period overlaying Orange Period overlaying Mid Archaic Period.

The once highly visible shell middens attracted excavators Jeffries Wymann (1873) and C.B. Moore (1892-1894) in the late 19th century, who documented, excavated, and collected artifacts from many of these sites, recovering valuable information but heavily disturbing the sites in the process. Wymann is believed to have visited and documented 8VO37, 8VO38, 8VO40, 8VO41, and 8VO42. Moore is believed to have visited and documented 8VO39.

In 1991, State archaeologists with the Conservation and Recreation Lands (CARL) program revisited four previously recorded sites in the park (8VO37, 8VO38, 8VO39, 8VO41) and identified and recorded two new sites (8VO3447& VO3448) on the newly acquired Starke Tract.

Between 2000 and 2002 the University of Florida archaeologist Dr. Ken Sassaman and field school students tested the Blue Spring Midden B (8VO43) beneath the Thursby House and down slope in the proposed location of a wastewater treatment facility. Their work at the park demonstrated that intact midden deposits with a substantial pre-ceramic occupation period underlay both locations at greater depths below ground level than expected. Evidence from the Orange period and St. Johns period were also found. Jeffries Wymann visited this site in the 1870's; however, the mound he had observed adjacent to the river-spring run confluence has been removed. (Sassaman 2003)

Dr. Sassaman and field school students also surveyed 8VO41. The midden, while highly looted in the 1970's; was found to still contain intact material from the Early Mt Taylor to St Johns Period II. These intact underlying deposits confirm the archaeological significance of this midden to the history of the middle St. Johns River. (Sassaman 2003)

In 2002, Pan-American Consultants, Inc. conducted an archaeological survey of 20 acres slated for cabin construction, locating and recording four more cultural sites. They included 8V5272, 8V07229, 8V07230 and 8V07231.

Site 8V05272 is referred to as the Blue Spring Railroad. The railroad was constructed in 1881, was mule-drawn and ran from Orange City (Graves Avenue) to Blue Spring Landing. In 1887, the line connected to New Smyrna Beach and was renamed the Blue Spring, Orange City and Atlantic Railroad (BSOC&A). The BSOC&A became part of the Florida East Coast Railway in 1896. The railroad, constructed out of midden material, still exists, is missing the rails, and has been paved over for the majority of the distance. It is commonly referred to as Magnolia Avenue.

Sites 8V07229 and 8V07230 are referred to as the West and East Middens respectively. Not believed to be connected, the middens are located near the Blue Spring Railroad. St. Johns period pottery was found in the West Midden, while the East Midden contains re-deposited midden material and an unidentifiable chert biface.

Site 8V07231 is referred to as the Cabin Scatter. Prehistoric lithic scatter was also found, including a Florida Archaic Stemmed (Marion subtype) projectile point. (Estabrook 2002).

Site 8VO39 is unlike the other middens. Located in the center of the relic orange grove on the Starke Tract, this is a dirt mound. It is unknown at this time whether it is natural or anthropogenic. It was previously visited by C.B. Moore in 1894. During his visit, he excavated in the center of the mound.

In 2010, an archaeological resources sensitivity model was completed for Blue Spring State Park by the University of South Florida. The results of the model break the park up into three categories, low, medium, and high sensitivity for archaeological resources. The majority of the park falls into low sensitivity (68.59%), as opposed to medium sensitivity (25.91%), or high sensitivity (5.50%). The model operated well, capturing the majority of the known cultural resources in high and medium sensitive areas.

Condition Assessment: The condition of two of the archaeological sites at the park is unknown. The location of site 8VO40 (Palmetto Shell Midden) is in debate. The location of site 8VO2594 (Paradise Indigo Vats) is currently unknown. The area believed to contain the site has not shown any visual clues. There is a need for an archeological survey in order to determine the location of both sites.

Adjacent to the packing house is the residence (8VO2641/8VO8263). The wooden building collapsed after 2003, and the debris remains unchanged in a collapsed pile. The collapse happened since the last plan was written and therefore the condition of the site has been changed to poor.

The rest of the archeological sites can be considered to be in good condition. A visual assessment was accomplished in the fall of 2012. The majority of the sites are located in remote areas of the park with limited human impact. The sites have had minimal disturbance such as minor animal disturbance and wave action.

Site 8VO43 (Blue Spring Midden B) endures the most human traffic. Located in the park's lower use area, the majority of the use area is located on the midden. While there is constant picnicking and foot traffic, the condition of the midden remains basically unchanged in good condition.

Sites 8VO7229 (West Midden), 8VO7230 (East Midden), and 8VO7231 (Cabin Scatter) are located in the park's cabin area; however, the sites are located in the woods outside the main car and foot traffic area and therefore, the good condition of the sites remains unchanged.

Site 8VO41 (Live Oak Midden) is located north of French Landing. In the past, this site had been subjected to substantial vandalism. Since park acquisition, the vandalism has stopped. The condition of the site is listed as good since the site has not changed. Despite varying disturbances, archaeological testing has uncovered the presence of subsurface deposits still in good condition at this site.

Site 8VO5272 (Blue Spring Railroad) is in poor condition due to vegetative growth, erosion, and the impact of park improvements and recreational uses in the surrounding area. The site was paved over long ago, so further damage will be minimal.

The good condition of site 8VO3447, the Stark House, has not changed. This site is located in an area not open to the public and consists of the house foundation with piles of bricks, metal, and other building materials.

It should be noted that the condition assessment ranking of good is based upon the amount of deterioration and disturbance since acquisition of the park. Prior to park acquisition, many of these sites had been adversely impacted by destructive 19th century excavations, 20th century development; including residential and commercial construction. Impacts also included citrus production, shell mining, river dredging, various park improvements, recreational uses and vandalism in the distant past.

All of the sites are also subject to the deteriorating effects of, and impacted to varying degrees by, natural elements such as water, weather, vegetation and animals. Together, these threats gradually or quite suddenly erode or destroy the protective overburden or the shell midden and earthen mound matrix itself, leaving the site even more vulnerable to further deterioration.

General Management Measures: Currently, only six archeological sites are located in public use areas. Through careful planning of future development and coordination with DHR, these sites should remain intact.

The location of site 8VO40 is unknown. One belief is that it is located at French Landing. If so, this area is subject to high disturbance on a daily basis as a popular boat launch and fishing area. Until the area is paved with proper facilities, this will not change. A thorough archeological survey should take place to determine the location and condition of this site.

Site 8VO41 is located north of French Avenue. This midden has seen looting in the past and is occasionally visited by people walking through the woods (no trail is provided). Park law enforcement, provided by FWC, has monitored the area and noted any recent disturbance. Future trails should not lead anywhere near this midden or bring attention to it.

Site 8VO43 has the potential for substantial disturbance due to its location in the lower use area. However, the park monitors the public's use of this area closely and carefully works in and around the site in coordination with DHR. The rest of the middens and mound are located away from the public use areas. Careful future planning, control of trespassing, and feral hog removal will minimize impact on these sites.

Site 8VO3447 (Starke House) consists of the remnants of a collapsed house. The foundation is still present, as are piles of charred building materials (wood, brick, & metal). This site is outside the main public area and is not impacted by park visitors, therefore maintaining its good condition. The site should be continued to be monitored and public access should be restricted.

Site 8VO2594 (Indigo vats) is reported to be located in an area that is not accessible by the public. Without site pictures or written descriptions, the vats (number unknown) are believed to be constructed rectangles 30 meters off of the Lake Beresford shoreline. The vats were part of the process of dye extraction from the indigo plant. The dye was used to color cloth. Since the exact location of the site is unknown; a more thorough archeological survey should take place to find its location and condition.

Site 8VO2641/8VO8263 (Residence) is located in an area not accessible to the public. The collapsed wooden structure is believed to have been a residence for someone associated with the relic orange grove. The MSF places construction around 1910, based on architecture. The collapse occurred sometime between 2003 and 2006. The remains have not been disturbed. The site should be continued to be monitored for disturbance and public access restricted. A history of the relic grove would greatly add to the park's understanding its numerous cultural sites, and their importance.

Historic Structures

Description: Blue Spring State Park contains three recorded historical structures, the Thursby house, the well house for the Orange City Mineral Springs bottled water, and the orange grove barn. These structures contain information regarding the early history of Orange City, the citrus industry, small-scale agriculture, and the beginning of the containerized water industry in the area.

The first recorded purchase of land within the current park boundaries was in 1803 when Spain granted 1,000 acres to Francis P. Fatio, Jr. The land included Blue Spring and the upper half of the spring-run. Fatio never lived on the property. Later Louis P. Thursby and John Starke acquired the land. Thursby owned the lower half of the spring-run and Starke the upper half and the spring itself. Both were involved in citrus. Louis Thursby built the current Thursby house in 1872. It replaced a modest log cabin built by Samuel Parsons Sr. When the Thursby's sold their land, it was converted into a recreational area. Homer Smith operated the land as a park and fish camp, and Gordon Pierson subsequently operated the land as a park with cabins, boats, and concessions 1969 when they sold the land to Keystone Enterprises. The intention was to develop the land into a type of resort by adding campsites, pool, and bathhouses. The development failed, the land reverted to the Pierson family, and the State of Florida purchased the land from the Piersons in 1972. The original purchase was 300 acres. An additional purchase of the spring was made at the same time.

The Thursby House (8VO5162), the park's most visible and accessible historical cultural resource, has been relatively well documented in terms of both architectural evaluation and historical research.

Lord Beresford owned part of the Starke Tract during the British period (1763-1783) where he cultivated indigo and sugarcane. In 1803 the land was acquired by Francis P Fatio. Fation never lived on property. In 1851, Captain John W Starke purchased the 1000 acres from Fatio. (Francke et Al. 1986) Starke planted a citrus grove and the grove remained in production until 1985. Remnants of citrus production can still be found in the relic grove. The Starke orange is named after him. The Starke house was built in the same time period as the Thursby house (circa 1870). Although the house was burned down by vandels in 1962, charred remains can still be found north of the relic grove. At the northern end of the grove, south of the Starke house is a still-standing wooden barn believed to have been constructed around 1900. To the east of the barn is the collapsed remains of a residential structure. The house is believed to have been built around 1910. It collapsed between 2003 and 2006. It is unknown at this time who built either structure.

Site 8VO8325, the Orange City Mineral Spring Company, is located on park property near Blue Spring Avenue. The site consists of a cement foundation and a cement-block building. The foundation was the site of the bottling plant. The building contains the well-head, which was last used in 2003. The operation began in 1891 as the Orange City Mineral Spring Company and became the Florida Mineral Water Company in the 1960's. The company shipped containerized water (cans and bottles) globally as a high-end "table water" product. Crystal Springs bottling company utilized the wellhead until 2003. (Ste. Claire 2007)

The relic orange grove is being submitted to the Florida Master Site File as a rural historical landscape. Currently the Master Site File (MSF) contains the following files located within the relic grove: 8VO38 (Lake Beresford Midden B), 8VO39 (Starke Mound), and 8VO2640 (Fatio Rd Barn), 8VO2641 (Fatio Rd Residence), and 8VO8263 (Unrecorded Farmstead). A thorough archeological survey of the relic orange grove will likely find additional cultural resources. The park would benefit from a thorough background search on the history of the Starke Tract. While much has been learned about the Thursby family, little is known about the Starkes. Information about the history of the park's two borrow pits would also be beneficial.

Blue Spring was acquired and opened as a state park in 1972. At acquisition, there were already a number of buildings in place, including a concession building, a swimming pool (now filled in), a swimming pool equipment building, and a 5-bay open shed. In 1973, a mobile home and storage building were added. In 1974, four utility buildings were added. By the end of this unit management plan cycle, these buildings will meet the historic benchmark of fifty years old. In addition, five buildings were added in 1977, and they will be forty-eight years old by the end of this plan.

Condition Assessment: The condition of the three historical structures at Blue Spring State Park is based upon visual inspection by park staff who have completed DHR's Archeological Resource Management (ARM) training.

The Thursby House (8VO5162) is presently in fair condition. The problems that have plagued previous preservation treatment projects, and the ways these problems have adversely impacted the historic fabric and characteristics of the structure, are well documented and on file. Due to the age of the house, there are issues with minor wood rot (wet and dry), mold, wood weakness (due to heavy traffic), peeling paint (interior and exterior), pillar deterioration, and sheet rock deterioration. The house was used heavily until the early 1970's but maintenance started to decline, especially on the second and third floors. The first floor is open with passive interpretation where it receives heavy foot traffic. A maintenance plan and schedule is in place to repair and prevent threats.

The barn (packing house) (8VO2640/8VO8263), located on the Starke Tract, is still intact however there is weather damage to the roof and siding. In 2007 the area was struck by a tornado, and it is believed the strong winds loosened part of the metal roof and cypress siding. The siding is partially held in place by vines. The building is located in an area not currently open to the public. The current condition of the barn is poor. The roofing and siding have been in decline since the 2005. Though the frame appears solid, it is uncertain how structurally sound the building currently is.

Site 8VO8325, the Orange City Mineral Spring Company, is currently listed in fair condition. The site is in an unsecure location east of the main park property (across the railroad tracks). Currently the area around the site is used as an unauthorized local dumping ground and graffiti has defaced the building walls. The building remains padlocked and it is assumed that the contents of the building have remained unchanged. The park does not have a key to the padlock.

General Management Measures: Currently, only three structures are located in or near public use areas. Through careful planning of future development and coordination with DHR, 8VO5162 (Thursby House) should remain stable. Restoration work on the house should be discussed as part of the maintenance plan and schedule. Work on the windows to replace frames and glass was completed in 2019. Parts of the packing house and barn have collapsed around 2017 following a local storm. The rest of the structure will continue to deteriorate over time. There is no plan for adaptive reuse of this structure.

Collections

Description: Blue Spring State Park also possesses a collection of objects primarily associated with the Thursby House and the stream boat era. These objects were acquired through donation by private individuals to the Florida Park Service, and through purchase of antiques by the park in an effort to furnish the former historic house

museum (1982-1989). The collection also contains two books which belonged to the Thursbys and a stereopticon with photo inserts.

Other collection items include postcards made prior to park acquisition and a painting of the spring-run done before the spring was a state park. There is a collection of slides of Blue Spring and various other state parks, which is located in the administrative building. There is a winch and axle which may be from the steamboat era and bottles removed from the spring-run that which were traced back to the late 1800's or early 1900's. A variety of animal specimens are used for interpretative programs, these include a skull and bones from a Florida manatee, Florida black bear, white-tailed deer, feral pig, peninsular cooter, and taxidermy of a barred owl, double-crested cormorant, kestrel, and osprey. Display cases contain a variety of pre-Columbian artifacts such as arrowheads, pottery shards and tools.

The Thursby House Collections Objects include domestic furnishings, household objects, and archival material from the late 19th to the first half of 20th century. When the museum was closed to the public, the collection objects continued to be stored in the structure, which did not have a controlled climate or pest control. The objects were exposed to the elements, piled atop each other and located in foot traffic corridors, which subjected them to breakage, dirt accumulation, and infestation. Because the Thursby House is now used to house interpretive exhibits, the park no longer needs the majority of the collections objects. At the present time a few collection objects are incorporated into the closed exhibit cases and on display in the kitchen, while many of the objects are being temporarily stored at the Orange County Regional History Center until a decision is made about their final disposition.

Condition Assessment: Since 2004 the Thursby house educates through passive interpretive displays and a furnished kitchen. The majority of the items from the house museum are no longer needed. These objects have been moved into temporary storage, are awaiting final disposition, and their current condition is unknown by the park. The objects remaining on display in the Thursby House and in the kitchen are considered to be in good condition, based upon the most recent inventory. Maintenance and inspection of the collection has been sporadic. Cleaning tasks and appropriate cleaning methods for the various types of objects have not been delineated, and collection object maintenance has not been incorporated as a routine part of park staff's duties. Consequently, the collection objects' condition is not regularly inspected, and records of maintenance work are not regularly generated, although the objects have been catalogued and numbered. The collection was visited during the 2003 Cultural Resource Management Evaluation (RME), and at that time, it was determined that the collection was in poor condition overall. Since then a majority of the collection was relocation to temporary storage. The remaining collection's condition is good overall, with individual items ranging from good to poor condition.

The wildlife specimens and painting are in good condition and are stored in the administrative building. The books, postcards, and stereopticon (with inserts) are in fair condition and are all stored in the administrative building. Bottles found within the spring-run are in poor to fair condition. Bottles appropriate to the Thursby era are stored inside of the house in the kitchen, the rest are stored in a locked shed. The axle, thought to be from a steamboat, is on display in the lower use area, adjacent to the boardwalk. It is exposed to weather and is considered to be in fair condition. The winch was re-discovered in 2010 adjacent to the shop complex in the woods. Like the axle, it has been exposed to weather and is considered to be in fair condition.

General Management Measures: Items of importance must be cared for in a manner suitable for the item. All of the items in the collection should be secured in order to prevent theft. Items that can be damaged by humidity and mold should be kept in a climate controlled environment. The axe and wench can be outside with little harm but would benefit from being sheltered. The collections items should be inventoried annually a maintenance protocol and schedule should be developed in a way that integrates the procedure into the general park maintenance schedule. A Scope of Collections should be developed with assistance from the Collections Administrator. The park will work with the Bureau of Natural and Cultural Resources (BNCR) and DHR to implement appropriate storage/cleaning protocols and determine what should be done with items in storage.

Table 5. Cultural Sites Listed in the Florida Master Site File					
Site Name and FMSF #	Culture/Period	Description	Significance	Condition	Treatment
8VO37 Midden A Lake Beresford	Prehistoric/Unspecified	Archaeological Site/Shell Midden & Campsite	NE	G	P
8VO38 Midden B Lake Beresford	Prehistoric/Unspecified	Archaeological Site/Shell Midden & Campsite	NE	G	P
8VO39 Starks' Grove Mound	Prehistoric/St. Johns II	Archaeological Site/Dirt Mound	NE	G	P
8VO40 Palmetto Shell Midden	Prehistoric/St. Johns	Archaeological Site/Shell Midden, Cave/Sink, Habitation	NE	?	P
8VO41 Live Oak Midden/ Mound in the Woods above Blue Spring	Early Mt Taylor to St. Johns II	Archaeological Site/Shell Mound, Habitation	NE	G	P
8VO42 Midden A Blue Spring	St Johns, St Johns II	Archaeological Site/Shell Midden, Habitation	NE	G	P
8VO43 Midden B Blue Spring	Prehistoric, Mt Taylor, Orange, St Johns	Archaeological Site/Shell Midden, Burial, Habitation	NS	G	P
8VO44 NN	Mt. Taylor, St Johns	Archaeological Site/Shell Midden, Habitation, Shell Mound	NS	G	P
8VO2594 Paradise Indigo Vats	20 th Century American (1900-)	Historical Site/Vats, Dock	NE	?	?
8VO2640 Fatio Road Barn	c. 1910	Historic Site/ Barn	NS	P	P

Table 5. Cultural Sites Listed in the Florida Master Site File

Site Name and FMSF #	Culture/Period	Description	Significance	Condition	Treatment
8VO2641 Fatio Road Residence	c. 1900	Historic Site/ Collapsed building	NS	P	P, R
8VO3447 Stark House	c. mid to late 1821- present (burned down - 1962)	Historic Site/Homesite, Building remains	NE	G	P, R
8VO3448 Stark Midden	Prehistoric/St Johns	Archaeological Site/Shell Midden, Campsite	NE	G	P
8VO5162 Louis P. Thursby House	c. 1872	Historic House	NRL	F-P	RH
8VO5272 Blue Spring Railroad	19 th Century American 1821-1899 20 th Century American 1900-	Historic Shell Railroad, Building remains, road segment, town, well	NS	P	P
8VO7229 West Midden	Prehistoric/St. Johns	Archaeological Site/Shell Midden, Specialized site	NE	P	P
8VO7230 East Midden	Prehistoric	Archaeological Site/Shell Midden, Specialized site	NE	P	P
8VO7231 Cabin Scatter	Prehistoric	Archaeological Site/ Specialized site	NS	P	P
8VO8263 Unrecorded Farmstead (aka 8VO2640 & 8VO2641)	1900-1910	Historic Site/Land	NE	P	P, R
8VO8325 Orange City Mineral Spring Company	20 th Century American 1900-	Historic Site/ Building remains	NS	F	P, R

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. The DRP will implement the following goals, objectives and actions, as funding becomes available, to preserve the cultural resources found in Blue Spring State Park.

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

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 DHR for review and comment prior to undertaking the proposed project. In addition, any demolition or substantial alteration to any historic structure or resource must be submitted to the DHR for consultation and the DRP must demonstrate that there is no feasible alternative to removal and must provide a strategy for documentation or salvage of the resource. 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 the DHR.

Objective A: Assess and evaluate 18 of 20 recorded cultural resources in the park.

- Action 1 Complete 18 assessments/and evaluations of archaeological sites. Priorities are the Thursby House, Fatio Rd Barn/Packing House, & Bottled water building. Significance should be determined and a plan developed if preservation is warranted.
- Action 2 Complete 3 Historic Structures Reports (HSR's) for historic buildings and cultural landscape. Prioritize stabilization, restoration and rehabilitation projects.
- Action 3 Coordinate with BNCR to complete a structural assessment of the Thursby house and continue to stabilize as necessary.
- Action 4 Coordinate with MSF to correct any duplications and errors in form data.
- Action 5 Consult with BNCR and DHR about the significance of the relic orange grove and determine whether to restore the site as a cultural resource or restore the site to its original natural community.
- Action 6 All sites with known locations will be visited every 2 years and appropriate forms will be updated and submitted.

The Thursby House and the Fatio Rd Barn are the priorities for preservation and stabilization. The Thursby House has peeling paint, floor sagging, mold/mildew, and crumbling plaster. The Fatio Rd Barn has had very little attention. The barn is over 100 years old, and may be significant to the history of citrus production in Volusia County. The Fatio Rd Barn and the Orange City Mineral Springs building need to be resubmitted to MSF using the HSR form. The relic grove needs to be submitted to the MSF as a rural historical landscape. The grove has been in existence since the 1850's and may be significant to the history of citrus production in Volusia County. Significance also needs to be determined. If it is determined to be significant, a preservation plan needs to be developed. All sites should be visited minimally every two years to documents and changes/treats which would alter management activities.

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

- Action 1 Ensure all known sites are recorded or updated in FMSF.
- Action 2 Conduct Level 1 archaeological survey for high and medium priority areas identified by predictive model or other previous study.
- Action 3 Develop and adopt a Statement of Interpretation.
- Action 4 Develop and adopt a Scope of Collections Statement.
- Action 5 Conduct oral history interviews.
- Action 6 Compile a park administrative history.
- Action 7 Compile a history of the Starke family, any subsequent owners of the Starke Tract, and all land uses.
- Action 8 Compile a history of the pre-Columbian Native Americans who lived in the area around Blue Spring Run.

Visiting each site minimally ever two years will ensure that the MSF is up-to-date. A priority during the next round of visits is to record the relic grove as a historic rural landscape, a ditch (with clay pipe) in the grove as a linear feature, and the brick wall section. The Starke Tract has not had a thorough survey, making it a priority prior to deciding future management of the parcel (restoration, preservation, or development), with a focus on undocumented sites, the exact location of the Paradise Indigo Vats & Palmetto Midden, the contents of the relic orange grove, and scrub restoration areas (including proposed firebreaks in Zones 17, 19, 20).

History of the land, prior to and post state acquisition, will assist in land management of the natural and cultural resources. There are currently gaps in the park's knowledge of the property, including background on the Starke family, more information on the pre-Columbian Native Americans who resided on property, land uses post-Thursby, etc. This information will also enhance our interpretation program (active and passive).

Objective C: Bring 1 of 20 recorded cultural resources into good condition.

- Action 1 Design and implement regular monitoring programs for 1 cultural site
- Action 2 Create and implement a cyclical maintenance program for each cultural resource.
- Action 3 Conduct a structural assessment (including the need for stabilization) of the Thursby House and stabilize as necessary.

The Thursby House (8V05162) is presently in good condition. The problems that have plagued previous preservation treatment projects, and the ways these problems have adversely impacted the historic fabric and characteristics of the structure, are well documented and on file. Due to the age of the house, there are issues with minor wood rot (wet and dry), mold, wood weakness (due to heavy traffic), peeling paint (interior and exterior), pillar deterioration, and sheet rock deterioration. The house had heavy usage until the early 1970's afterwards, house maintenance started to decline, especially on the second and third floors. The first floor is open with passive interpretation where it receives heavy foot traffic. A maintenance plan and schedule is being developed to repair and prevent threats.

Objective D: Work to involve the University of Florida Archaeological Field School in further research regarding park mounds and middens.

- Action 1 Facilitate additional ground penetrating radar surveying of 8VO43.
- Action 2 Facilitate the transit mapping and limited testing of an unrecorded mound (may be 8VO44 nn).
- Action 3 Facilitate the reconnaissance survey to locate 8VO40 and 8VO2594.
- Action 4 Facilitate the subsurface characterization of small shell-bearing sites along the east terrace of the St. Johns River.

The University of Florida Archaeological Field School has been of great assistance to the park in the recent past. They assisted with park development projects and have furthered the park’s knowledge on some of the middens onsite. Park staff will work to facilitate their return to the park in order to conduct further research on these three sites. The actions above were taken from their reports as suggested future projects. The priorities would be locating 8VO2594 (Paradise Indigo Vats) & 8VO40 (Palmetto Shell Midden), and a more in-depth survey of Midden B – Blue Spring (8VO43).

Timber Management Analysis

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

During the development of this plan, an analysis was made regarding the feasibility of timber management activities in the park. A timber management analysis was conducted and is found in the appendix of this plan.

For Blue Spring State Park, it was determined that the removal of certain species within the scrub, mainly rusty lyonia and mature sand pine, could be accommodated in a manner that would be compatible and not interfere with the primary purpose of resource-based outdoor recreation and conservation (see Addendum 6).

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, the DRP works with the local mosquito control district to achieve consensus. Treatment methods including larviciding and ground adulticiding (truck spraying in public use areas) are typically allowed. Aerial adulticiding can be allowed through an agreed upon control plan. The DRP does not authorize new physical alterations of marshes through ditching or water control structures. Mosquito control plans temporarily may be set aside under declared threats to public or animal health, or during a Governor’s Emergency Proclamation.

Currently there is no arthropod control plan for Blue Spring State Park.

Additional Considerations

The park manages a 400-foot sovereign submerged area primarily along the western boundary in the St. Johns River. Management of this area includes exotic plant removal, erosion control, water quality, and boating restrictions related to the Florida manatee. These areas are managed in cooperation with the Florida Coastal Office (FCO) (the Wekiva River, Middle St. Johns, and Tomoka Marsh Aquatic Preserve staff), in partnership with FWC IPMS and USACE for invasive plant management.

Resource Management Schedule

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

Land Management Review

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

Blue Spring State Park was subject to a land management review on October 9, 2018. 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

Land use planning and park development decisions for the state park system are based on the dual responsibilities of the 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. These dual responsibilities inform all recreational and infrastructure development considerations. Balancing equitable access to recreational facilities and preservation of Florida's resources is the main priority when developing recreation and land use proposals.

The general planning and land use planning process begins with an analysis of the natural and cultural resources of the unit, proceeds through the creation of a conceptual land use plan, and 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 meetings and advisory groups with key stakeholders. With this approach, the DRP's objective is to provide high-quality facilities 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 management plan includes an inventory and brief description of the existing recreational uses, facilities, and special conditions on use. Specific areas within the park that will be given special protection are also identified. The Land Use Component then summarizes the Conceptual Land Use Plan (CLUP) for the park and identifies large-scale repair and renovation projects, new building and infrastructure projects, and new recreational amenities that are recommended to be implemented over the next ten-year planning period. Any adjacent lands that should be pursued for acquisition are identified as a part of the park's Optimum Boundary.

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

Blue Springs State Park has seen human activity for over 6,000 years. There is evidence of extensive prehistoric activity that has yet to be fully documented and could hold important information for archaeologists in the future. Since the 1800's and early 1900's, the property has seen uses including orange groves, a steamboat landing, lodge, post office, dairy, and recreational park. After the 1930's, the property was marketed for outdoor recreation. When the State purchased the property in the 1972, the public was using the spring run for swimming and related recreational activities. Without proper management, the spring run had been subject to overuse and suffered from severe erosion and litter. The natural resources of the spring run have made an outstanding recovery since the transfer of the property to state ownership.

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.

Within Volusia County, Blue Spring State Park is classified as both conservation lands and an environmental resource corridor. Lands with these designations are considered ecologically significant and environmentally sensitive. Both classifications provide regulations on what uses are permitted for these lands, such as fishing and hunting management areas, historical or archeological sites and general public uses.

Current Recreational Use and Visitor Programs

Popular recreational uses at the park include swimming, camping, picnicking, and hiking. The park's concession operation offers tube rentals, food service, and merchandise sales at the Upper Spring Run Area. The concession operation also offers canoe, kayak, and tube rentals along with boat tours along the St. John's River at the Lower River Day Use Area. Visitation tends to increase for manatee season during November to March. After manatee season, the spring run opens for swimming from April to October.

Blue Spring State Park recorded 559,835 visitors in FY 2020/2021. By DRP estimates, the FY 2020/2021 visitors contributed \$84.5 million in direct economic impact, the equivalent of adding 1,183 jobs to the local economy (FDEP 2021).

Other Uses

Blue Spring State Park provides exceptional outdoor laboratories for students and scientists because of the seasonal abundance of the Florida Manatee, the wealth of archaeological sites, and the great diversity of natural communities and wildlife.

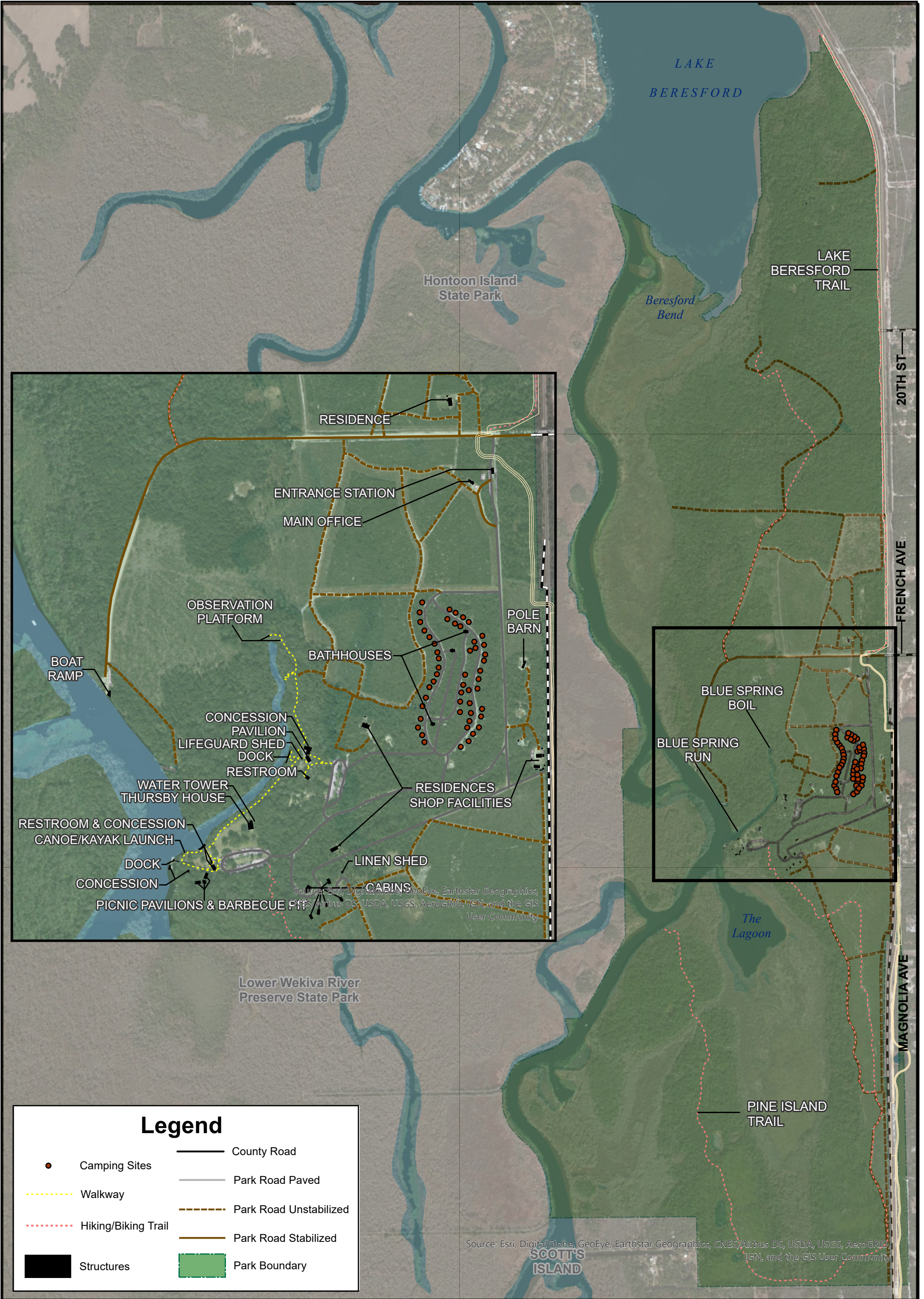
Protected Zones

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 Blue Spring State Park all wetlands and floodplain and 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

Park facilities are focused around the central portion of the park and oriented around Blue Spring and the spring run. Two main day use areas, the Lower River Area and the Upper Spring Run Area, provide user access to the St. Johns River and the spring run. Concession operations are focused around these two areas, and interpretive programs are focused on educating visitors about the Spring Run and the manatees it protects. A 50-site campground is located just to the northwest of the Upper Spring Run Area. Support facilities are dispersed between these main day use areas and in the Shop Area to the west of the campground. To the north at the intersection of French Avenue with the park boundary lies the Entrance Area, which includes a ranger station and office building. The northern extent of the park can be accessed via the Starke Tract Trailhead to the west of the Entrance Area. (see Base Map).



BLUE SPRING STATE PARK

0 0.25 0.5 1 Miles

BASE MAP

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

Recreation Facilities

Lower River Area

- Large Picnic Pavilions (2)
- BBQ Pit
- Medium Restroom
- Playground
- Parking Area (86 spots)
- ADA Parking (5 spots)
- Boat / Bus Parking (10 spots)
- Floating Dock
- Concession Building (2)

Cabin Area

- Cabins (6)

Thursby House Historic Area

- Thursby House

Park Trails

- Spring Run Boardwalk (.48 mi)
- Starke Tract Trails (4.01 mi)
- Pine Island Trail (3.62 mi)

Upper Spring Run Area

- Concession Building
- Large Picnic Pavilion
- Gazebo
- Restroom
- Parking Area (88 spots)
- ADA Parking (4 spots)

Campground

- RV/Tent Sites (50)
- Bathhouse (2)
- ADA Parking

French Landing

- Unpaved parking

Support Facilities

Park Entrance

- Ranger Station
- Office

Thursby House Historic Area

- Water Tower

Cabin Area

- Linen Shed

Support Area

- Storage Building (5)
- Pole Barn (5)
- Shop Building

Parkwide

- Staff Residence (3)
- Bay Shop (2)
- Volunteer Residences

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. 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 and design constraints are investigated in greater detail. Municipal sewer connections, advanced wastewater treatment or best available technology systems are applied for on-site sewage disposal.

Creation of impervious surfaces is minimized to the greatest extent feasible in order to limit the need for stormwater management systems, and all facilities are designed and constructed using best management practices to limit and avoid resource impacts. Federal, state and local permit and regulatory requirements are addressed during facility development. This includes the design of all new park facilities consistent with the universal access requirements of the Americans with Disabilities Act (ADA). After new facilities are constructed, park staff monitors conditions to ensure that impacts remain within acceptable levels.

Public Access and Recreational Opportunities

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

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

Objective: Maintain the park's current recreational use.

The park will continue to provide opportunities for swimming, camping, hiking, picnicking, and paddling.

Objective: Continue to provide and evaluate interpretive programs.

Throughout the year, Blue Spring offers many interpretive opportunities to visitors such as ranger led guided tours like First Day Hike and a bird watching tour offered twice a year. During November, the park hosts a Native American Heritage guided hike highlighting the different plants that are still found at the park, and how they were used for medicinal and other purposes. The park also hosts seasonal programs highlighting the manatees present at the park during November to April. Other seasonal programs include an after-hours firefly event.

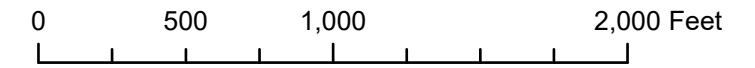
Objective: Plan and develop new interpretive opportunities

For future interpretation opportunities, the park plans to develop 3 programs around the rich history of the park including the past steamboat activity along the St. John's River during the 19th century, a living reenactment of the families and pioneers once living at present day Blue Spring State Park, and a program about William Bartram, an American botanist who explored the St. Johns River and all of Florida. One additional program is to be developed about the park's threatened and endemic animal species.



BLUE SPRING STATE PARK

Conceptual Land Use Plan



- Park Boundary
- Structures
- Spring Run
- Park Road
- Park Trails
- Campsites
- Proposed Developments

- 1** Park Entrance - Relocate park entrance to alleviate current issues of cars stacking along West French Avenue and general congestion and develop new traffic plan.
- 2** Support Area - Expand current shop building to a larger footprint, and improve staff access to area by stabilizing leading road. Add residence or volunteer site within the open field adjacent to support area. Relocation of the shop will be considered
- 3** Campground - Add up to 10 new campsites a mixture of RV , tents, glamping, and volunteer sites. Upgrade utilities within entire campground and add a new dump station at the southern end of campground.
- 4** Pine Island Trail - Develop new boardwalk from existing Pine Island Trail, approximately 200 feet, for new viewing opportunities of the lagoon.
- 5** Lower River Use Area - Develop manatee staging area along spring run. Add new dock with up to 10 boat slips for outside boaters along river. Add new floating dock for paddling launch. Add small Environmental Education Building.
- 6** Upper Spring Run - Renovate main concession building, formalize outdoor/indoor seating, meeting space, and new storage areas for tube rentals. Expand boardwalk along spring run, and replace/renovate current restroom.
- 7** Inholding - Acquire park inholding, approximately .28 acres
- 8** French Landing - Develop master plan to formalize area. Stabilize road leading to French Landing. Upgrade boat ramp and add small fishing dock. Add one interpretive kiosk

Capital Facilities and Infrastructure

Goal: Develop and maintain use areas and support infrastructure.

Potential development at the park over the next ten years will mainly consist of improving or replacing existing structures. Improvements at the marina use area are geared toward enhancing the visitor experience, while new development at the support areas will allow for increased park management capabilities. 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.

Objective: Maintain all use area and support facilities in the park.

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

Objective: Improve 8 use areas

Major repair projects for park facilities may be accomplished within the ten-year term of this management plan, if funding is made available. These include the modification of existing facilities to bring them into compliance with the Americans with Disabilities Act.

Lower River Day Area

Home to a first magnitude spring, the park provides refuge to hundreds of manatees each year and has become a known location for manatee releases. To continually support these releases, a formal release area is proposed along the spring run. Adjacent to the release area, a small ADA-accessible observation area will be added for visitors to safely observe the releases.

Further developing the waterfront boating access area along the St. John's River, for outside boaters, a new dock, up to 10 boat slips will be added and an iron ranger for fee collection. A floating dock will be added for the kayak and canoe users to launch from the park onto the St. John's River. Replacement or renovation for all three concession buildings are recommended.

A new environmental educational building will allow for continued park interpretation, educational opportunities, and meeting space is also proposed. The building is to have a restroom attached. The building may be open air or fully enclosed depending on division funding. The park's playground is to be replaced within its current footprint.

Upper Spring Run Area

The Upper Spring Run Area is one of the popular use areas in the park, especially during the summer. A master plan to renovate the concession building within this area includes adding a second story or expansion of the current footprint, formalizing indoor / outdoor seating, and adding a storage area for tube rentals. Along the spring run, the current boardwalk is to be expanded to accommodate increased visitor use and improve ADA access. Additional improvements include a small or medium sized picnic pavilion and replacement or renovation of the current restroom.

Campground

Improvements at the park's campground includes the addition of up to ten campsites. The new 10 campsites should be a mix of RV, tents, concession run glamping sites, and volunteer host spots. Utility upgrades within the entire campground are recommended, and the addition of a new dump station towards the southern end of the campground.

Park Entrance

A plan will be developed to relocate the park entrance to alleviate the current issues of cars stacking along West French Avenue and general congestion associated with day use and overnight visitors entering the park. With this relocation, a new traffic plan will also be developed to reroute visitors into the park via existing management roads. Alternative park entrance options will be explored if the park's inholding is acquired. If this inholding is acquired, entrance redesign alternatives should also consider how to control access to French Landing.

French Landing

A master plan will be developed to formalize French Landing. Developments include stabilizing or paving the road leading to the landing and developing up to 10 parking spots near the boat ramp. To continually facilitate the popular recreational activities at, the current boat ramp should be upgraded and the addition a small fishing dock. Other recommended additions to French Landing include a small restroom and an interpretive kiosk describing the hydrology of the St. John's River and the parks relation to neighboring Hoonah Island State Park.

Support Area

Within the support area, plans include expanding the shop to a larger footprint and stabilizing the road leading to the support area. A plan will be developed to improve staff access and parking at the shop compound. Volunteer sites or a new residence should be developed in the area adjacent to the shop. Relocation of support area will be considered within this unit management plan.

Parkwide

All septic tanks should be replaced and or connecting remaining park infrastructure to the local sewer system and repaving the main park road. Up to three new residences should be added to the park.

Pine Island Trail

To provide a viewing opportunity of the park's lagoon, a new boardwalk extending from the existing Pine Island Trail is proposed. The boardwalk will be approximately 200 feet in length with a small overlook at the end.

Visitor Use Management

The DRP manages visitor use to sustain the quality of park resources and the visitor experience, consistent with the purposes of the park. The dynamic nature of visitor use requires a deliberate and adaptive approach to managing resource impacts from recreational activity.

To manage visitor use, the DRP will rely on a variety of management tools and strategies, potentially including modes of access and limits on the number of people within certain areas of the park. Achieving balance between resource protection and public access is fundamental to the provision of resource-based recreation and interpretation. The premise of a visitor use management strategy is to protect the park's significant natural and cultural resources. A strategy may include site-specific indicators and thresholds selected to monitor resource conditions and visitor experience. By monitoring conditions over time and clearly documenting when conditions become problematic, the DRP can implement actions to prevent unacceptable resource conditions.

Levels of visitation, patterns of recreational use, and varieties of available recreational activities are routinely monitored parkwide. Indicators have shown that this park is operating sustainably for its resources and offers high quality experiences for its visitors.

Resource indicators to be considered during this planning period include:

- Erosion along spring run and embankments

Quality of visitor experience indicators to be considered include:

- Obstruction of viewsheds in scenic areas of the park
- Congestion of both day use areas by visitors at one time
- Excess litter at upper and lower use areas

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

Specific thresholds for resource conditions and experiential quality have not yet been established for Blue Spring State Park. As monitoring continues, collected data may be used to determine baseline and desired conditions, thereby establishing thresholds.

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.

On the western boundary of the park is an inholding approximately 0.28 acres which includes a residence. Acquisition of this inholding will allow for continued resource management protection of the St. Johns River and development of French Landing. Please reference park's Conceptual Land Use Plan 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 Blue Spring State Park State Park in 2005, significant work has been accomplished and progress made towards meeting the DRP's management objectives for the park. These accomplishments fall within five of the five general categories that encompass the mission of the park and the DRP.

Natural Resources

- Blue Spring State Park and has implemented a Volunteer program called "Manatee Observer" for monitoring and protecting Manatees during the swimming season April to November.
- *Blue Spring State Park has partner up with Volusia County's Natural Resource Department a project called Save our Springs and River Academy.*
- 40 plus Scrub Jays counted during the 2019 Scrub Jay watch program
- Florida Park Service and FWC combined funds to address erosion and stabilization problems in the spring run from the refuge to the Spring head.
- Park Staff and volunteers have recorded Exotic Species removal of Armored Catfish (*Pteryogoplichthys disjunctivus*)- averaging over 2,000 individual catfish each year since 2015.

Cultural Resources

- ADA pathway for access to Historic Thursby house accessibility added in 2018.
- 20 windows renovated at the historic Thursby House, reminiscent to when the house was built in 1873.

Recreation & Visitor Service

- Blue Spring State Park offers concessions who provide kayaking tours and rentals, Segway tours, Boat tours and Underwater diving excursions tours.
- 2016/2021-Blue Spring State and the Friends of Blue Spring CSO has created a seasonal After-hours Firefly event that runs for 2 weeks, where visitors can experience hundreds of thousand fireflies lighting up at night around the Springs and boardwalk area.
- 2017/2021-Annual Native American Heritage guided tour through park about plant life and for medicinal use.
- Removed old campground restroom and converted area into two full-service volunteer camp-host sites and reopening 2 more campsite for additional revenue.

- Blue Spring State Park and Volusia County completed the Spring to Spring bike trail to connect Blue Spring State Park hiking, biking and equestrian trails with county trails.
- 4 Park information kiosk created throughout the park to inform the public about park activities.
- Addition of .08-mile spurs Loop Trail to Pine Island Trail.

Park Administration and Operations

- Stark Multi-use Trail improvements (located at French Avenue landing)- Fencing, parking, information Kiosk, mile markers and Trail maintenance.
- Built volunteer villages including screened patio with ice machine, laundry washers, dryers and refrigerator for volunteer use.
- Total volunteer hours for 2017-2021 at Blue Spring State Park was 42,527 hours.
- 2017 and 2020 received two new vehicles for park operations.
- One additional resident staff location, an employee-owned trailer site, has been established next to the existing volunteer village.
- Upgraded Park Ranger position into a Natural Resource Park Service Specialist.
- Blue Spring State Park partners up with Orange City for the Annual Manatee Festival each January for the past 10 years.
- Blue Spring entrance area has added a turn-around to accommodate for seasonally high visitation.

Park Facilities

- Removed old bunk house and added 3 new volunteer host sites to support park operations.
- 2 full-service Campground Family Bathhouse's built for Blue Spring campers in 2015.
- Improvement at shop facilities at Blue Spring by expanding eastside of shop compound and adding new Pole Barn, two new Equipment sheds for security and organization.

This management plan is written for a timeframe of ten years, as required by Section 253.034 Florida Statutes. The Ten-Year Implementation Schedule and Cost Estimates (Table 8) summarizes the management goals, objectives and actions that are recommended for implementation over this period, and beyond. Measures are identified for assessing progress toward completing each objective and action. A time frame for completing each objective and action is provided. Preliminary cost estimates for each action are provided and the estimated total costs to complete each objective are computed. Finally, all costs are consolidated under the following five standard land management categories: Resource Management, Administration and Support, Capital Improvements, Recreation Visitor Services and Law Enforcement. Statewide priorities for all aspects of land management are evaluated each year as part of the process for developing the DRP's annual legislative budget requests. When preparing these annual requests, the DRP considers the needs and priorities of the entire state park system and the projected availability of funding from all sources during the upcoming fiscal year. In addition to annual legislative appropriations, the DRP pursues supplemental sources of funds and staff resources wherever possible, including grants, volunteers and partnerships with other entities. The DRP's ability to accomplish the specific actions identified in the plan will be determined largely by the availability of funds and staff for these purposes, which may vary from year to year. Consequently, the target schedules and estimated costs identified in Table 8 may need to be adjusted during the ten-year management planning cycle.

Table 6. Ten-Year Implementation Schedule and Cost Estimates				
Goal I: Provide administrative support		Measure	Planning Period	Estimated Cost
<u>Objective A</u>	Continue administrative support	Administrative support ongoing	C	\$72,400
Goal II: Protect water quality and quantity in the park, restore hydrology, and maintain		Measure	Planning Period	Estimated Costs
<u>Objective A</u>	Assessment of the park's hydrological restoration needs	Assessment Completed	ST	\$75,000
Action 1	Continue the monitoring of the river water intrusion into the spring-run daily during manatee season.		LT	On going
Action 2	Begin to monitor/record the river water intrusion daily throughout the rest of the year using the manatee count form with transects.		LT	On going
<u>Objective B</u>	Improve natural hydrological conditions and functions to 206 acres of Freshwater Marsh natural community			
Action 1	Install water or culvert crossings along roads where needed	# of crossings installed	ST	\$50,000
Goal III: Restore and maintain natural communities		Measure	Planning Period	Estimated Costs
<u>Objective A</u>	Within 10 years, have 450 acres of the park maintained within the optimum fire interval	# Acres within fire return interval target	LT	
Action 1	Develop / update annual burn plan	Plan update	C	\$500
Action 2	Manage fire dependent communities by burning between 194 – 398 acres	Average # acres burned annually	C	ongoing
Action 3	Pursue installation / widening of 1-mile firebreaks on Starke Tract	Line Installed	ST	\$25,000
<u>Objective B</u>	Conduct natural community restoration on 10 acres of Scrub annually	# acres restored or with restoration underway	LT	\$35,000
Action 1	Continue scrub specific management plan and improvement of the restoration plan	Plan developed/updat ed	ST	\$1,500

Action 2	Conduct mechanical treatment through roller chopping and mowing on 10 acres annually to maintain scrub habitat in an optimal state for the Florida Scrub – jay	#Acres with restoration underway	LT	\$50,000
Action 3	Continue to monitor usage of restored scrub by the Florida Scrub - jay to determine effectiveness of restoration of the scrub – jay by conducting point count surveys annually.	# acres with restoration underway	LT	\$20,000
<u>Objective C</u>	Conduct natural community restoration on 150 acres of Floodplain Marsh			
Action 1	Continue to implement restoration plan in cooperation with FWC AHRES and FWC FWRI		LT	
Action 2	Prescribe burn marsh on a 2 -4 fire return interval		LT	\$15,000
Action 3	Control woody vegetation with herbicide when needed		LT	\$50,000
<u>Objective D</u>	Conduct natural community restoration on 50 acres of Scrubby Flatwoods			
Action 1	Conduct mechanical via mowing and roller chopping on 50 acres of scrubby flatwoods		ST	\$65,000
<u>Objective E</u>	Conduct natural community improvement on 2 acres		ST	\$200,000
Action 1	Monitor the spring-run bank adjacent to the boardwalk semi-annually pre and post swim season for native re-establishment and bank erosion due to lack of vegetation.		C	\$7,500
Action 2	Plant additional native vegetation along the boardwalk, as needed, in areas not filling in/areas of erosion.		C	\$5,000
Action 3	Continue to work with FWC on phase III of the spring boil bank stabilization.	Project Completed	ST	\$200,000
<u>Objective F</u>	Conduct natural community restoration on 0.17 acres of aquatic cave		ST	\$7,500

Goal IV: Maintain, improve, or restore imperiled species populations and habitats		Measure	Planning Period	Estimated Cost
<u>Objective A</u>	Expand the baseline imperiled species occurrence inventory list for plants and animals	List (developed) updated	C	ongoing
Action 1	Expand the baseline imperiled species occurrence inventory list for plant and animals within the park boundary		C	Ongoing
<u>Objective B</u>	Monitor and document 3 selected imperiled animal species	# species for which control measures implemented	C	
Action 1	Implement monitoring protocols for 3 imperiled animal species (gopher tortoise, Florida Scrub – jay, Florida manatee)	# Protocols Developed	ST	\$2,000
Action 2	Continue mapping (baseline survey) for gopher tortoise post prescribed fire	# acres surveyed	C	\$2,000
Action 3	Continue daily Florida manatee counts during the winter season. Continue to record daily dark water intrusion from the river		C	ongoing
Action 4	Continue to coordinate with Save the Manatee Club (SMC) on manatee identification during the winter season		C	ongoing
Action 5	Continue to coordinate with FWC and Sea to Shore Alliance on manatee health, rescues, and releases.		C	ongoing
Action 6	Continue the mapping/distribution/activity survey of the Florida scrub-jay each summer.		C	ongoing
Action 7	Continue to band the Florida Scrub – jay each year		C	\$7,500 per yr.
Goal V: Remove exotic and invasive plants and animals from the park and conduct needed maintenance control		Measure	Planning Period	Estimated Costs
<u>Objective A</u>	Annually treat 10 acres of exotic plants species in the park	# Acres treated	C	

Action 1	Annually Develop/update exotic plant management work plan	Assessment conducted	LT	\$5,000
Action 2	Implement annual work plan by treating 10 acres in park, annually, and continuing maintenance and follow-up treatments, as needed.	Plan implemented	LT	\$120,000
Action 3	Continue cooperation with FWC IPMS on the release of the air-potato beetle as a biocontrol of air-potato when needed	Beetles released	LT	As needed
Action 4	Develop an annual plan with Volusia County Parks and Recreation to control exotic plants found along the Spring-to-Spring Trail sections on park property	Plan Developed	ST	\$5,000
Action 5	Initiate communication/cooperation with FL Dept. of Transportation to control exotic plants found along the railroad right-of-way adjacent to park property.		ST	No cost
Action 6	Annually meet with the Blue Spring Interagency Working Group to update and continue the winter spraying moratorium.		C	No Cost
<u>Objective B</u>	Implement control measures on 3 exotic animal species in the park	# species for which control measures implemented	C	\$
Action 1	Remove all exotic fish species from the park		C	\$
Action 2	Trap and remove feral hogs as needed	# hogs removed	C	\$5,000
Action 3	Trap and remove domestic wildlife such as cats and dogs as needed		C	As Needed
Goal VI: Protect, preserve and maintain the cultural resources		Measure	Planning Period	Estimated Costs
<u>Objective A</u>	Compile reliable documentation for all recorded historical and archaeological sites	Documentation complete	LT	\$0
Action 1	Assess and evaluate 18 of 20 recorded cultural resources in the park	Assessment conducted	C	\$0

Action 2	Complete 3 Historic Structures Reports (HSR's) for historic buildings and cultural landscape.		ST	\$0
Action 3	Coordinate with BNCR to complete a structural assessment of the Thursby house and continue to stabilize as necessary.		ST	\$0
Action 4	Coordinate with MSF to correct any duplications and errors in form data.		ST	\$0
Action 5	Consult with BNCR and DHR about the significance of the relic orange grove		ST	\$0
Action 6	All sites with known locations will be visited every 2 years and appropriate forms will be updated and submitted.		ST	\$0
<u>Objective B</u>	Compile reliable documentation for all recorded historic and archaeological resources		LT	\$0
Action 1	Bring 1 of 20 recorded cultural resources into good condition		ST	\$0
Action 2	Work to involve the University of Florida Archeological Field School in further research regarding park mounds and middens		ST	\$0
Goal VII: Provide public access and recreational opportunities		Measure	Planning Period	Estimated Costs
<u>Objective A</u>	Maintain the park's current recreational use	#Recreation/visit or	C	\$1,400,000
<u>Objective B</u>	Continue current interpretive programs		C	\$0
<u>Objective C</u>	Develop new interpretive, educational and recreational programs	#Interpretive/ education programs	ST	\$3,000
Goal VIII: Develop and maintain the capital facilities and infrastructure		Measure	Planning Period	Estimated Costs
<u>Objective A</u>	Maintain all public and support facilities	Facilities maintained	C	\$4,000,000
<u>Objective B</u>	Improve 10-day use areas	#Facilities/ Miles of Trails/Miles of Roads	LT	\$

Addendum 1—Acquisition History

LAND ACQUISITION HISTORY REPORT

Park Name	Blue Spring State Park				
Date Updated	3/16/2018				
County	Volusia County, Florida				
Trustees Lease Number	Trustees Lease No. 2622				
Current Park Size	2643.90 acres				
Purpose of Acquisition	The state of Florida has acquired Blue Spring State Park for public health and safety, to preserve and protect the property, and to use the property as a site of water recreational area.				

Acquisition History (Includes only an acquisition of a parcel(s) with an area of 10 acres or more)

Parcel Name or Parcel DM-ID	Date Acquired	Initial Seller	Initial Purchaser	Size in acres	Instrument Type
DMID3158	5/26/1988	Volusia County, Florida	The Board of Trustees of the Internal Improvement Trust Fund of the State of Florida (Trustees)	870.063	County Deed
DMID3162	7/12/1978	Wayne Harrod, individually and as Trustee	Trustees	516.119	Quit Claim Deed
DMID3110	12/24/1974	Wayne Harrod, individually and as Trustee	Trustees	391.43	Warranty Deed
DMID3157	10/19/1972	Gordon W. Pierson and his wife Myrtle L. Pierson	Trustees	280.007	Warranty Deed
DMID3155	8/14/1972	C. C. Tomlin, Jr. and his wife Glenda S. Tomlin	Trustees	262.325	Warranty Deed
DMID3164	7/17/1978	Edwin P. B. Sanders, as Trustee	Trustees	163.796	Release
DMID14835	10/15/1997	Caney Creek Community Center, Incorporated, also known as Alice Lloyd College	Trustees	20.156	Warranty Deed
DMID3163	7/12/1978	Wayne Harrod, individually and as Trustee	Trustees	18.67	Warranty Deed

Management Lease

Parcel Name or Lease Number	Date Leased	Initial Lessor	Initial Lessee	Current Term	Expiration Date
Lease No. 2622	11/21/1972	The Board of Trustees of the Internal Improvement Trust Fund of the State of Florida	The State of Florida Department of Natural Resources, Division of Recreation and Parks	ninety-nine (99) years	11/20/2071

Outstanding Issue	Type of Instrument	Brief Description of the Outstanding Issue	Term of the Outstanding Issue
Reverter	Amended Quit Claim Deed	<i>This Amended Quit Claim Deed is subject to the condition that French Avenue and French Avenue Boat Ramp remain open 24 hours a day and at no cost to users until improvement is made to these two facilities. Should the state of Florida charge for admission and /or reduce hours of the operation without improving the two facilities, title to the subject properties would revert to the county of Volusia.</i>	in perpetuity

Blue Spring State Park Acquisition History

Addendum 2—Advisory Group Members and Report

Blue Spring State Park & Hontoon Island State Park Advisory Group Members and Report

Local Government

**The Honorable Ben Johnson,
Commissioner**
Volusia County Commission

**The Honorable Josh Blake,
Commissioner**
Lake County Commission

John Stockham, Planner III
Volusia County Planning Department

Tim Baylie, Director
Volusia County Parks and Recreation

Katrina Locke, Director
Volusia County – Sustainability & Natural
Resource

Georgia Turner, Chairperson
West Volusia Tourism Advertising Authority

Partnering State Agencies
Jason O’Donoghue, Ph.D.
Division of Historical Resources

**Jason Love, State Lands Management
Coordinator**
Florida Forest Service

Anthony Petellat, District Manager
Florida Forest Service

Erin McDevitt, District Manager
Florida Forest Service – North Region

Greg Workman, Regional Manager
Florida Wildlife Commission

**Barbra Howell, Aquatic Preserve
Manager**
Wekiva River Aquatic Preserve - DEP

Jeff Panther, Regulatory Director
St. Johns Water Management District

Environmental Organizations

Pat Rose, Vice Chair
Save the Manatee Club

Steven Kinter, Vice Chair
Blue Spring Alliance

Steve Wonderly, South Region Manager
Sierra Club – Volusia / Flagler Group

Volusia County Soil and Water

Florida Park Service
Dustin Allen, Park Manager
Blue Spring State Park

Devin Whitley, Park Manager
Hontoon Island State Park

Adjacent Landowners
Katherine Hallum
Trinket Mason
Debbie Cutler
Steven Aldrich

Local Stakeholder Groups
**Kristen Work, Chair – Biology
Department**
Stetson University

Citizen Support Organization
Melissa Gibbs, President
Friends of Blue Spring State Park

Peggy Thibodeaux, President
Friends of Hontoon Island State Park

Guest Services Inc, General Manager
BG Signatures

Florida Dive Company, General Manager
Florida Dive Company

Blue Spring State Park & Hontoon Island State Park Advisory Group Members and Report

Summary of Advisory Group Comments

The Advisory Group Public Meeting for the draft unit management plans for Blue Spring State Park and Hontoon Island State Park was held on June 21, 2022 in Orange City, Florida at the Orange City Wava Hall.

To begin the meeting, Ms. Armaghani, welcomed attendees to the public advisory group meeting for the draft unit management plans for Blue Spring State Park and Hontoon Island State Park. Additional members of the Florida Park Service present at the meeting included: District 3 Bureau Chief Robert Yero, District 3 Assistant Bureau Chief Jennifer Roberts, District Biologist Jason DePue, Blue Spring State Park Manager Dustin Allen and Assistant Manager Darrell Thomas, Hontoon Island State Park Manager Devin Whitney, Office of Park Planning Bureau Chief Brian Fugate, and Preston Earley.

To begin the presentation, Ms. Armaghani provided background information on both parks including their general location, what recreation opportunities can be found along with visitation statistics from the 2020/2021 fiscal year, and trends of general visitation at the park throughout the year. Further background information presented were the natural communities within each park's vast acreages and the different imperiled species present. Next, the resource management objectives for the next 10 years were presented along with the Conceptual Land Use Plan maps for both parks which laid out all proposed developments and improvements to the park in their respective use areas.

Following the conclusion of the presentation, there was a question and answer session where the public and advisory group had an opportunity to ask any additional questions.

Following the question and answer session, Ms. Armaghani concluded the meeting by providing additional information on the next steps of the draft plan including a two-week comment period that would end on July 5, 2022. Ms. Armaghani also informed the attendees of the public meeting that the plan would be later submitted to the Division of State Lands where they had 100 days to review the plan for hopeful approval on the October Acquisition and Restoration Council.

Summary of Advisory Group Comments

Several inquiries were made about both parks Conceptual Land Use Plans. At Blue Spring State Park, questions were related to the exact location of the park's relocation of the entrance. District Chief, Robert Yero, replied that the exact location and design has yet to be determined, but the utilization of existing service roads is being explored. A similar question was asked about the manatee staging area, and the location of the new proposed fishing docks at Blue Spring and Hontoon Island. Representatives from the Save The Manatees Club inquired about the proposed addition of the boat slips towards the St. John's River and if this for existing use or the anticipation of an increase of boat traffic. They also noted that an increase in boat traffic would have negative effects on manatees. Mr. Yero replied saying that no increase will be created from this proposed development, rather it would manage the location of where outside boaters land. Mrs. Armaghani added that currently visitors are landing and tying their boats to the trees causing a visitor use management issue. Additional stakeholders inquired about the use of park infrastructure currently on septic, and any future to switch to city sewage. Park Manager Dustin Allen noted that the overall goal within the Park Service is to connect all park infrastructure to

Blue Spring State Park & Hontoon Island State Park Advisory Group Members and Report

central sewage in the long term but currently the closest connection is 2 miles down West French Avenue. Mr. Yero added that full connection to a local sewer system in the short term is unlikely.

Resource management-based questions were also asked during the public advisory group meeting. The representative from the Sierra Club, inquired about the magnitude of the invasive plant and animal species at both Blue Spring and Hontoon Island. District Biologist Jason DePue replied noting that there are different levels of invasive species vary at each park, and that the development of buffers such as fire breaks have been successful to keep levels manageable. Mr. DePue also added that floating invasive are a challenge to treat, but those are often done by Army Corp of Engineers, FWC and the Park Service. Regarding invasive animal species, an inquiry was made on what animal species are currently present at Blue Spring State Park, Mr. DePue noted the presence of argentine tegus.

An additional question was asked about the current imperiled status of the little blue heron at Blue Spring State Park and why it is considered imperiled. Mr. DePue replied that they are listed as imperiled not due loss of habitat, but due to threats to nesting and rookeries and habitat loss from increased developments. Lastly, inquiries were made about the ongoing restoration of the spring run and spring boil. Mr. DePue added that all the restoration is being completed in phases, currently noting that the north side of the boil is being restored next and noting general success of the restoration so far. Visitor use issues where raised during the conversation of the park's restoration including the issues of visitors continually jumping off the recently restored embankments. Mr. Allen added that tension wires have been placed around the restored areas to deter continued jumping, but people are still finding ways to damage the area.

Representatives from the Florida Forest Service at the meeting noted the presence of the Land Management Report within the plans addendum and added they would like to see more data on the canopy cover and the trees in the overstory at both parks. The Forest Service's Recreation Coordinator commended both plans on their proposed improvements to recreation and support services while keeping conservation efforts in high consideration.

General and operational inquires presented at the meeting included park capacity and issues, and congestion problems at the park entrance from visitors waiting to enter Blue Spring especially during peak season. Attendees asked if the Park Service or if park management have looked into various options such as texting services or placing time limits to guests. Questions about park interpretive programming where presented regarding the Firefly Presentation at Blue Spring, to which Assistant Park Manager Darryl Thomas stated that this interpretive program is typically end towards the end of March.

Blue Spring State Park & Hontoon Island State Park Advisory Group Members and Report

Written Advisory Group Comments

Melissa Gibbs provided written comments on the Blue Spring State Park draft management plan regarding exotic species, hydrological issues, and visitor capacity. Full comments are attached below.

Representatives from Save the Manatee Club provided additional written feedback supporting future acquisition of land within the Wekiva – Ocala Greenway for Hontoon Island State Park. For Blue Spring State Park, concerns about loss of submerged aquatic vegetation within the St. Johns River system and available forage for manatees. Suggestions include the use of hand or mechanical removal as the preferred method versus the use of herbicide to treat aquatic invasive. The organization also commented on the proposed new boat slip dock along the St. Johns River and have recommended the implementation of a monitoring program by either volunteers or park staff to continually monitor manatees that may come into close proximity to the new boat slips, and to limit its use during colder months. Editorial comments were also provided. Full comments are attached below.

Jason O'Donoghue from the Division of Historical Resources provided editorial revisions for both Blue Spring and Hontoon Island's draft plans.

Summary of Written Public Comments

Suze and Fred Peace provided public comments on both the Blue Spring State Park and Hontoon Island State Park draft unit management plans. Regarding Blue Spring, Mr. and Mrs. Peace showed support for the proposed environmental education building and suggested the addition of meeting space within the building itself. Additional comments include removing all plastic bags from the concession rather using paper bags instead. Regarding Hontoon Island State Park, Mr. and Mrs. Peace showed support for the proposed shade pavilion at the parking area, new fishing dock within the day use area, and new trail connections. Suggestions made include the addition of new interpretive signage within certain areas of the park.

Edward Evangelidi provided public comments on the draft plan for Blue Spring State Park supporting the addition of new amenities such as the new fishing dock, interpretive kiosk, and restroom to French Landing.

Katherine Hallum provided public comments regarding the draft plan for Blue Spring State Park suggesting additional land use component proposals: new loops within the existing trail system to accommodate for off road electrical wheelchairs, a new connection within the Stark Multiuse Trail, and an adult fitness playground.

Staff Recommendations

Staff recommendations include making editorial revisions to both plans.

Blue Spring State Park & Hontoon Island State Park Advisory Group Members and Report

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. The 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 Division of Recreation and Parks staff.



Blue Spring State Park & Hontoon Island State Park

Public Advisory Group Meeting – 6/21/2022





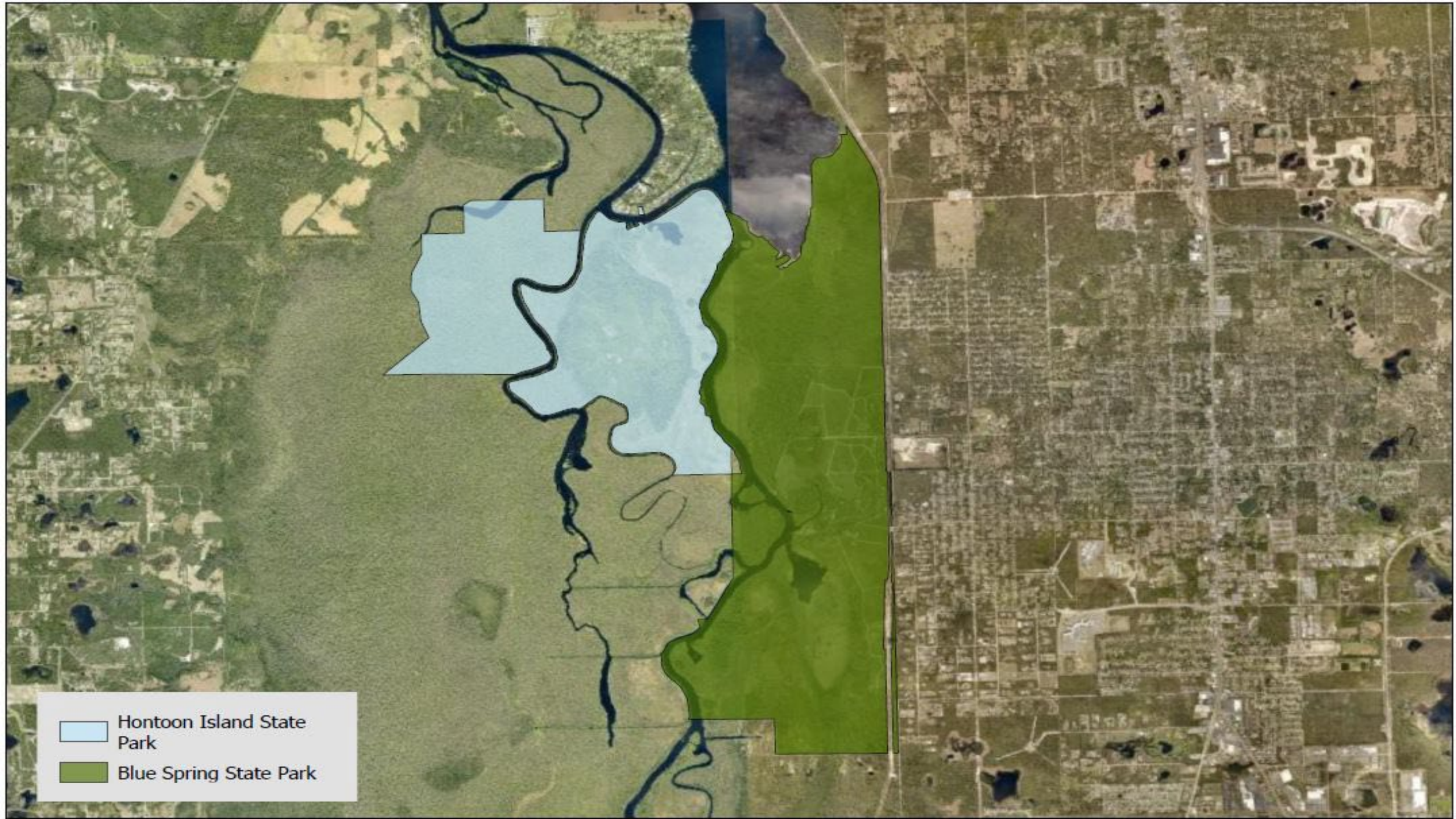
Blue Spring State Park & Hontoon Island State Park

Public Advisory Group Meeting – 6/21/2022

Agenda

- Introductions
- Background Information
- Management Objectives
- Question & Answer
- Open Discussion





Hontoon Island State
Park



Blue Spring State Park



Blue Spring State Park & Hontoon Island State Park

Recreation & Visitation

Recreational Opportunities

- Paddling
- Camping
- Fishing
- Hiking

Visitor Attendance – 2020/2021 Fiscal Year

- 559,835 Visitors – Blue Spring
- 38,264 Visitors – Hontoon Island





Blue Spring & Hontoon Island State Park

Natural Community Acreages

Blue Spring		
Natural Community	Acreage	Percentage
Floodplain Swamp	1,416.59	50%
Floodplain Marsh	889.41	32%
Scrub	157.10	6%
Mesic Hammock	97.15	3%
Blackwater Stream	75.52	3%
Total Acreage	2,643.90	

Hontoon Island		
Natural Community	Acreage	Percentage
Floodplain Swamp	1,104.62	57%
Upland Mixed Woodland	606.13	13.8%
Hydric Hammock	372.67	11.6%
Floodplain Marsh	146.25	10.8%
Altered Landcover Types	75.53	1.6%
Total Acreage	1,648.90	



Blue Spring & Hontoon Island State Park

Imperiled Species

Blue Spring State Park – 27 Imperiled Species

- Manatee
- Florida gopher frog
- Gopher tortoise
- Shell mound prickly - pear

Hontoon Island State Park – 12 Imperiled Species

- Little blue heron
- Wood stork
- Banded wild pine
- American alligator





Blue Spring & Hontoon Island State Park

Resource Management Objectives

Blue Spring
Hydrological
Improve 206 acres of freshwater marsh
Prescribed Fire
Burn 194 – 398 acres annually
Natural Community Restoration
Restore acres of Scrub, Floodplain Marsh, Scrubby Flatwoods, Mesic Hammock & Aquatic Cave
Imperiled Species
Monitor 3 species (gopher tortoise, Florida scrub jay and Florida manatee)
Exotic Species
Treat 10 acres annually
Implement control measures on 3 species
Cultural Resources
Monitor 2 sites per year

Hontoon Island
Hydrological
Conduct assessment on hydrological needs
Prescribed Fire
Burn 106 – 211 acres annually
Natural Community Restoration
Restore 178.47 acres of Floodplain Marsh
Imperiled Species
Monitor 2 species (gopher tortoise & plume polypody)
Exotic Species
Treat 2 infested acres annually
Implement control measures on 2 species
Cultural Resources
Monitor 13 sites per year



Blue Spring & Hontoon Island State Park

Proposed Developments & Improvements

Conceptual Land Use Plan





BLUE SPRING STATE PARK

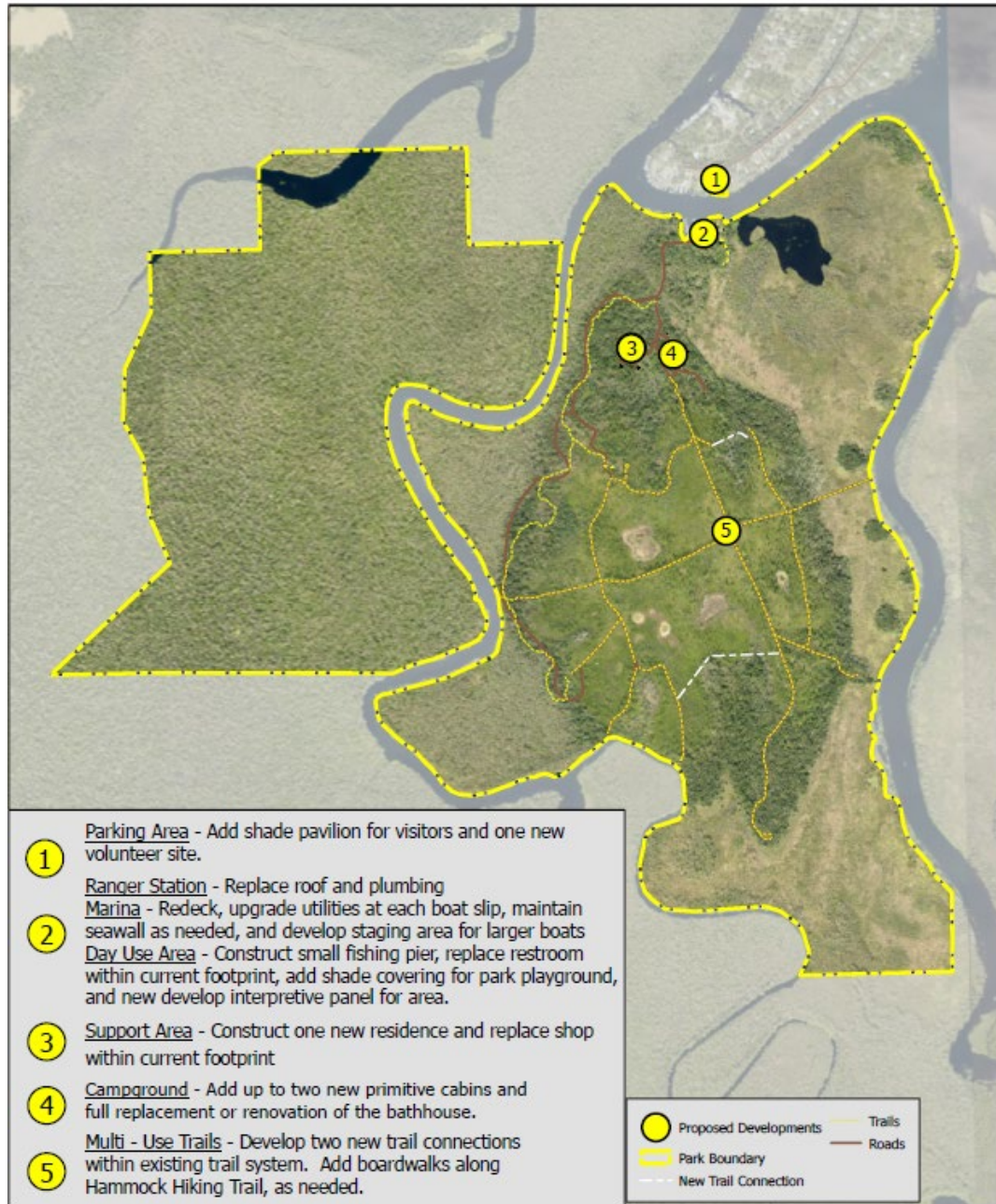
Conceptual Land Use Plan

0 500 1,000 2,000 Feet

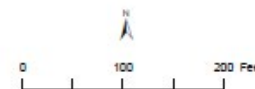


- Park Boundary
- Structures
- ▬ Spring Run
- ▬ Park Road
- ▬ Park Trails
- Campsites
- Proposed Developments

- 1** Park Entrance - Relocate park entrance to alleviate current issues of cars stacking along West French Avenue and general congestion and develop new traffic plan.
- 2** Support Area - Expand current shop building to a larger footprint, and improve staff access to area by stabilizing leading road. Add residence or volunteer site within the open field adjacent to support area. Relocation of the shop will be considered
- 3** Campground - Add up to 10 new campsites a mixture of RV , tents, glamping, and volunteer sites. Upgrade utilities within entire campground and add a new dump station at the southern end of campground.
- 4** Pine Island Trail - Develop new boardwalk from existing Pine Island Trail, approximately 200 feet, for new viewing opportunities of the lagoon.
- 5** Lower River Use Area - Develop manatee staging area along spring run. Add new dock with up to 10 boat slips for outside boaters along river. Add new floating dock for paddling launch. Add small Environmental Education Building.
- 6** Upper Spring Run - Renovate main concession building, formalize outdoor/indoor seating, meeting space, and new storage areas for tube rentals. Expand boardwalk along spring run, and replace/renovate current restroom.
- 7** Inholding - Acquire park inholding, approximately .28 acres
- 8** French Landing - Develop master plan to formalize area. Stabilize road leading to French Landing. Upgrade boat ramp and add small fishing dock. Add one interpretive kiosk



HONTOON ISLAND STATE PARK Conceptual Land Use Plan





Blue Spring State Park & Hontoon Island State Park

Public Advisory Group Meeting – 6/21/2022

Comment Period

Open Through July 5

Yasmine.Armaghani@FloridaDEP.gov

FloridaDEP.gov/Parks/Public-Participation



PLEASE SIGN IN (PRINT CLEARLY)

**BLUE SPRING STATE PARK – HONTOON ISLAND STATE PARK
ADVISORY GROUP PUBLIC MEETING
JUNE 21, 2022**

PRINT NAME

EMAIL ADDRESS (NOTE: UNDER FLORIDA LAW, EMAIL ADDRESSES ARE PUBLIC RECORDS.)

- | | | | |
|--------------------------|-----------------------------------|-------------------------------------|-------------------------------------|
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| 2. Mitchell Greenberg | Mitch.Greenberg@SORBIAORLANDO.COM | <input type="checkbox"/> | Check Box for Advisory Group Member |
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| 4. Wayne Hartley | vanger wh @ att.net | <input type="checkbox"/> | Check Box for Advisory Group Member |
| 5. Michael Edwards | michael.Edwards@FDACS.com | <input checked="" type="checkbox"/> | Check Box for Advisory Group Member |
| 6. DAVID BOTTOMMIZI | MICHAMOCHA18@YAHOO.COM | <input type="checkbox"/> | Check Box for Advisory Group Member |
| 7. Barbara Howell | Barbara.Howell@Florida.DEP.gov | <input checked="" type="checkbox"/> | Check Box for Advisory Group Member |
| 8. Suze Peace | IOSfpeace@gmail.com | <input type="checkbox"/> | Check Box for Advisory Group Member |
| 9. FRED PEACE | " " | <input type="checkbox"/> | Check Box for Advisory Group Member |
| 10. Jim Newell | Billing@FloridaDive Company.com | <input type="checkbox"/> | Check Box for Advisory Group Member |

PLEASE SIGN IN (PRINT CLEARLY)

**BLUE SPRING STATE PARK – HONTOON ISLAND STATE PARK
ADVISORY GROUP PUBLIC MEETING
JUNE 21, 2022**

PRINT NAME

EMAIL ADDRESS (NOTE: UNDER FLORIDA LAW, EMAIL ADDRESSES ARE PUBLIC RECORDS.)

- | | | | | |
|-----|------------------|---|-------------------------------------|-------------------------------------|
| 1. | Connor Wagner | Connor.Wagner@FloridaDEP.gov | <input type="checkbox"/> | Check Box for Advisory Group Member |
| 2. | Carla Berchem | cberchem@save-the-manatee.org | <input type="checkbox"/> | Check Box for Advisory Group Member |
| 3. | Alex Zelenski | azelenski@clearviewgeographic.com
<i>representing Sierra Club
Steve Wonderly</i> | <input checked="" type="checkbox"/> | Check Box for Advisory Group Member |
| 4. | Tara Wagner | wagasw@comcast.net | <input type="checkbox"/> | Check Box for Advisory Group Member |
| 5. | KATHERINE HALLUM | DBIKE56@GMAIL.COM | <input type="checkbox"/> | Check Box for Advisory Group Member |
| 6. | YOKO SHIMADA | | <input type="checkbox"/> | Check Box for Advisory Group Member |
| 7. | John Baker | johnbaker700@gmail.com | <input type="checkbox"/> | Check Box for Advisory Group Member |
| 8. | Melinda A. Arni | Melinda.Arni@FDACS.gov
<i>Representing
FL Forest
Service</i> | <input checked="" type="checkbox"/> | Check Box for Advisory Group Member |
| 9. | | | <input type="checkbox"/> | Check Box for Advisory Group Member |
| 10. | | | <input type="checkbox"/> | Check Box for Advisory Group Member |

From: [Melissa Gibbs](#)
To: [Armaghani, Yasmine](#)
Subject: blue spring
Date: Tuesday, June 14, 2022 8:31:42 AM

EXTERNAL MESSAGE

This email originated outside of DEP. Please use caution when opening attachments, clicking links, or responding to this email.

I received the email about the advisory group and have read the document & prepared comments (tho I will be out of town and unable to attend the meeting).

~Missy Gibbs

Comments:

I don't think BSSP is "exemplifying the balance between enjoying & protecting the spring"....in fact, the state of the park has gone downhill in the past 10 years....we are destroying it

I also don't think that the park is promoting "responsible aquatic activities". Although most visitors are fairly responsible, the complete lack of law enforcement and reduced staffing means that no one is there to ride herd on irresponsible park visitors. They are damaging the headspring (climbing to jump) with impunity.

The brown hoplo (fish) is not really a problem...the most common exotic fish are Pterygoplichthys (armored catfish), Tilapia, Grass Carp and now, Chanchita (another cichlid that we have seen in ever increasing numbers in the upper half of the spring run).

I'm a little confused about the hydrological management plan, as I don't see that will be affected until water removal by humans is greatly reduced. The river has always backed up in the late summer/fall to some extent. I don't understand the first hydrological objective at all. Where is the proposed culvert? And won't that interfere with natural hydrology? The document says that the historic flow was 162 cfs, but doesn't say what the current flow is.

Water lettuce is not exotic...there is pretty clear evidence from 15,000 year old sediment cores that include water lettuce seeds.

The water in the spring run is rarely very clear, due to the excessive numbers of park visitors allowed in...we need to cut down the number of people allowed into the park to better protect it.

We need to not just monitor erosion...we need to have law enforcement DO something about the people who are breaking the law and undoing 100s of thousands of dollars worth of restoration work!

The primary manatee assessments are by SMC, so that should be reflected in the document. The park also does manatee counts, but are relatively new to it.

p. 55 – "Work in progress" is Rubio et al. 2016

p. 59 Objective B – "Remove all exotic fish species from the park" is literally impossible. It would be incredibly difficult even if there were no connection to the river, but there is....it is fluid. We can never remove the exotics, but we can mitigate the impact they are having by protecting the spring a little more. Its being loved to death right now and over the past 24 years of conducting research there, I've only seen it go downhill....both in terms of water



SAVE THE MANATEE® CLUB

The Voice For Manatees Since 1981

Ms. Yasmine Armagani
Florida Department of Environmental Protection
Sent Electronically Only

RE: Blue Spring State Park and Hontoon Island State Park Unit Management Plans

Ms. Armagani,

We appreciate this opportunity to comment on the Blue Spring and Hontoon Island State Park Unit Management Plans and the long-term, continued collaborations between the Park Service and Save the Manatee Club that is acknowledged in the plans.

We commend park staff for success in implementing the plan adopted in 2005 and generally support the proposed projects and improvements included in the current draft. As you are likely aware, we continue to be concerned about the loss of submerged aquatic vegetation in the St. Johns River system and the availability of forage for manatees at Blue Spring and the surrounding area. We are encouraged by the partnership demonstrated by the Blue Spring Interagency Working Group and ask that special attention is paid to any herbicide application affecting plants that serve as food sources for the manatee (particularly water lettuce and water hyacinth). Mechanical or hand removal should be identified in the plans as the preferred option for managing invasive or nuisance aquatic vegetation when necessary.

We understand that a ten-slip boat dock is proposed at Blue Spring and agree that it is important to manage waterward access. Manatees must traverse this area when coming to or leaving the spring, and as such, the project has the potential to result in increased manatee-human conflicts. We recommend including a provision to monitor use and for additional staff or volunteers to serve as a manatee observer(s) at the dock during high-use periods, particularly during cold events when manatees are present in high numbers. Please also consider limiting dock use during winter months.

Regarding Hontoon Island, development pressures continue to be of concern, and we support continued acquisition of the properties identified in the Florida Forever 5-yr Plan (2022) for the Wekiva-Ocala Greenway in the vicinity.

We have also provided additional specific comments as an attachment to this letter, and hope that you will take them under advisement as you finalize the respective unit management plans.

As always, please let us know of any way that we can continue to be of assistance with volunteers, signage, research and other issues that pertain to manatees at Blue Spring and Hontoon Island.

Regards,

Kim Dinkins
Sr. Conservation Associate- Save the Manatee Club

Blue Spring/Hontoon Island Draft Management Plans
Save the Manatee Club Comments

Blue Spring

- p. viii and p. 85: The plan mentions the Manatee Observer Volunteer Program but does not list it as a collaboration between multiple agencies, incl. Save the Manatee Club (SMC), Clearwater Marine Aquarium Research Institute (CMARI) and Volusia County Environmental Management (VCEM)
- p. viii: The plan mentions “monitoring protocols will be developed for the gopher tortoise, scrubjay and manatee” – per the public comment meeting these are ongoing plans that are continuously adjusted and Save the Manatee Club has input on the monitoring plan for the Florida manatee.
- P.58: We would like to make sure that special attention is being paid whenever removal of invasive vegetation is addressed that may serve as a food source for the manatee (water hyacinth, water lettuce in particular).
- P.17 under “Soils”, the 2nd paragraph states that the erosion at the boil is caused by the “tunneling of manatees”. While manatees are certainly part of the issue causing erosion, they are not the sole culprit and especially at the boil (vs. the undercut banks along the spring run), most erosion is caused by visitors not obeying the rules.
- P. 19: The plan says FWC/FWRI are “monitoring hypothermia” – Our understanding is that this means FWC is monitoring the health of the manatees and intervenes in case a manatee with cold stress syndrome is found in the spring run. Perhaps this statement should be clarified.
- P.20: The plan mentions “continued river intrusion monitoring to provide data on manatee distribution”. This statement and the section on river intrusion seems confusing and may need to be re-phrased. The dark water intrusion itself does not provide data on manatee distribution, but rather on shifts in temperature and spring flow which affects manatee distribution. Save the Manatee Club has a long history of documenting river intrusion since the early 1980s which has helped with the establishment for MFLs for Blue Spring. We would like to know if the park has plans to increasingly monitor the river intrusion more closely (SMC will continue to do so during the winter months).
- P.34: The plan states that the spring is “devoid of vegetation because the manatees eat it.” It is unclear whether this is in regard to submerged aquatic vegetation (SAV) or floating vegetation. The little floating vegetation there is at the beginning of winter season is being eaten by manatees, but there is no SAV to begin with and there has not been for many years.
- P.47: The Blue Spring Interagency Working Group is correctly mentioned in the Hontoon Plan, but referred to as the “Aquatic Plant Management Working Group” in this document. This should be corrected/standardized.
- P. 47: The plan mentions SMC and the park coordinating the manatee ID research but does not list SMC as an agency to assist with rescue/release, we would like to be included as a participating agency for manatee rescues/releases. Any mention of Sea 2 Shore should be changed to their updated name Clearwater Marine Aquarium Research Institute (CMARI). Another option would be to mention the Manatee Rescue and Rehabilitation Partnership (MRP) of which all above mentioned agencies are part of.
- P. 53: There seems to be a typo in the section where it talks about vegetation monitoring for the FL scrubjay but instead says “manatee”.
- P.81 The plan mentions a new environmental education building. We are very supportive of this project and would like the opportunity to participate as appropriate.
- P.8 1 The plan mentions the addition of 10 new boat slips down by the river. Per the public comment meeting, we understand that this is not because the park is anticipating more boat traffic but to better manage existing boats that dock along the shoreline without any limits. We

Blue Spring/Hontoon Island Draft Management Plans
Save the Manatee Club Comments

want to point out that year-round manatees use this area to travel from the spring run to the lagoon and back.

Hontoon Island

- P.58 We appreciate that under improved use areas, the plan mentions they want to put up more educational manatee signage. Please let us know if we can be of assistance.
- As with the Blue Spring management plan, we would like to ask that special attention is paid to any herbicide application affecting plants that serve as food sources for the manatee (particularly water lettuce and water hyacinth)



FLORIDA DEPARTMENT *of* STATE

RON DESANTIS
Governor

CORD BYRD
Secretary of State

July 5, 2022

Yasmine Armaghani
Office of Park Planning
Florida Department of Environmental Protection
Division of Recreation and Parks
3900 Commonwealth Boulevard
Tallahassee, FL 32399

Dear Ms. Armaghani,

Thank you for inviting the Division of Historical Resources (DHR) to participate in the advisory group review of the draft unit management plan for Blue Spring and Hontoon Island State Parks. Overall, the plans sufficiently address the historical resources of the parks. We have the following comments and recommendations:

1. There are some discrepancies between the plans and those of the Florida Master Site File (FMSF). For the Hontoon Island plan, the first portions of the Cultural Resources section correctly discuss 14 archaeological sites. However, Table 5 (pp. 44–45) lists 15 archaeological sites. According to our records, site 8VO238 lies outside the park boundaries and should be removed from this list. Further, the goals and objectives for Cultural Resources (pp. 45–47) refer to 13 cultural resources. This should be changed to 14.
2. Resource groups 8VO07236 (Atlantic & Western RR) and 8VO07641 (Jacksonville, Tampa, & Key West Railroad) intersect Blue Spring State Park but are not listed in the plan.
3. Archaeological site 8VO8263 is listed in Table 5 of the Blue Spring State Park plan, but no forms were ever filed for this site with the FMSF. This site number has been merged with 8VO2641 and should be removed from the plan. If this is incorrect, please contact FMSF staff to reconcile the discrepancy.

Division of Historical Resources
R.A. Gray Building • 500 South Bronough Street • Tallahassee, Florida 32399
850.245.6300 • 850.245.6436 (Fax) • FLHeritage.com



4. The number of cultural resources given throughout the report will need to be updated based on the above comments. According to FMSF records, there are 14 cultural resources in Hontoon Island State Park (all archaeological sites) and 21 cultural resources in Blue Spring State Park (17 archaeological sites, 2 resource groups, and 2 standing structures).
5. The Management Procedures for Archaeological and Historical Sites and Properties on State-Owned or Controlled Properties provided in Addendum 7 is out of date (both plans). The most recent version can be found at:
<https://dos.myflorida.com/historical/preservation/compliance-and-review/regulations-guidelines/>
6. We recommend that all archaeological and historical resources be monitored for degradation on an annual basis. Staff from DHR's Public Lands Archaeology section can provide guidance if you feel certain sites need not be monitored annually or at all.

Please let us know if you have any questions or concerns regarding these comments. Thank you for your diligence in preserving, promoting, and interpreting Florida's cultural heritage.

Sincerely,



Jason O'Donoughue, Ph.D.
Bureau of Archaeological Research
B. Calvin Jones Center for Archaeology
1001 DeSoto Park Drive
Tallahassee, Florida 32301
850-245-6481
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Addendum 3—References Cited

Blue Spring State Park References Cited

Blue Spring State Park References Cited

Addendum 4—Soils Description

Blue Spring State Park Park Soils Descriptions

1 - Apopka fine sand, 0 to 5 % slopes - This is a nearly level to gently sloping well drained soil on upland ridges, side slopes, and knolls of the North Central Florida Ridge and the Florida Flatwoods. The water table is below 72 inches, run-off is slow and permeability is rapid in the sandy layers and moderate in the sandy clay loam subsoil. In the southern part of the DeLand ridge, the natural vegetation is a forest of sand live oak, sand pine and laurel oak. The understory consists of common prickly pear cactus, gopher apple and scattered saw palmetto. This soil type occurs at Blue Spring in a large portion of the sand pine scrub community.

4 - Astatula fine sand, 0-8% Slopes - This excessively drained nearly level to sloping soil is on uplands of the South Central Florida Ridge, Southern Florida Flatwoods, and a few areas of the Eastern Gulf Coast Flatwoods. The water table is always below 80 inches and is usually below 120 inches. The natural vegetation is sand pine, turkey oak, laurel oak and longleaf pine, however sand pine grows best. The understory includes fetterbush, bluestem and scattered saw palmetto. Commonly found in sandhills, at Blue Spring the relic orange grove on the 'Starke tract' covers the location of this soil type.

10 - Bluff sandy clay loam - This nearly level, very poorly drained, frequently flooded soil is on low terraces bordering the St. Johns River. Natural vegetation must be water tolerant due to frequent flooding for long durations. Vegetation includes cypress, swamp maple, loblolly pine, cabbage palms, and bluestem. The floodplain swamp communities along the St. Johns River are dominated by this soil type.

17 - Daytona sand, 0 to 5 % slopes - This soil is moderately well drained and occurs on knolls and ridges in the flatwoods. In some areas the water table may come within 30 inches of the surface, but normally is within 40 - 50 inches in the wet season and possibly 72 inches in the dry times. There is commonly a brushy understory of bluestem, switchgrass and sand pine. At Blue Spring this soil type occurs in the scrubby flatwoods, mesic flatwoods and xeric hammock.

20 - EauGallie fine sand - This soil is nearly level and poorly drained with a sandy surface layer over loamy subsoil, usually associated with flats, sloughs, and depressions in Peninsular Florida. The water table fluctuates within 1-10 inches of the surface for periods of 1-4 months in most years and within 40 inches for more than 6 months. This soil type occurs in the hydric hammock and one are of mesic flatwoods areas in Blue Spring.

22 - Electra fine sand, 0-5% slope - This is a poorly drained, nearly level soil which occurs in slight ridges in flatwoods. The water table is at 20-40 inches for about 4 months during most years and recedes to below 40 inches during drier periods. At Blue Spring, xeric hammock that includes scrub oak, fetterbush, gallberry and an understory of saw palmetto. This soil is limited to a small area along the eastern bank of the Blue Spring run where it meets the St. Johns River, and two areas of scrubby flatwoods on the Starke Tract.

25 - Gator Muck - This soil is a very poorly drained, nearly level, well-decomposed organic soil that occurs in depressions and on floodplains. The water table is at or above the soil surface in spring, summer, fall, and is within 10 inches of the soil surface in winter. Natural vegetation includes swamp hardwoods with American elm, bald cypress, cabbage palm, red

Blue Spring State Park Park Soils Descriptions

maple, sweet gum and an understory of maidencane, saw grass, cord grass and wax myrtle. This soil is a good wetland wildlife habitat and underlies the lagoon and side slough floodplain marsh and the floodplain swamp oxbow (Snake Creek oxbow) on the west side of the river at Blue Spring.

29 - Immokalee sand - This nearly level, poorly drained sandy soil generally occurs in flatwoods, between sand ridges, or in slightly elevated areas between ponds and sloughs. The water table is within 10 inches of the surface for 1 to 2 months in most years and between 10 to 40 inches for more than half the year. Occasionally in very wet seasons, it rises above the surface for extended periods. The natural vegetation is an open forest of slash pine and longleaf pine and an understory of saw palmetto and gallberry. Immokalee sand is associated with mesic flatwoods, hydric flatwoods, and underlies areas of baygall at Blue Spring.

37 - Orsino fine sand, 0 to 5 % slopes - This moderately well drained, nearly level and gently sloping sandy soil occurs on moderately high ridges in the Coastal Plain. The water table is 40 to 60 inches below the soil surface in wet seasons and below 60 inches in the dry seasons. The natural vegetation is a forest of sand pine, slash pine, and an understory of scattered saw palmetto and scrub oaks. This soil underlies the mesic hammock community to the west of the spring run up to and including the French Avenue landing. The soil is also found east of the railroad in xeric hammock.

42 - Paola fine sand , 0 to 8 % slopes - This excessively drained, nearly level sandy soil occurs on uplands. The water table is below a depth of 72 inches. The available water capacity, the organic matter content and the natural fertility are very low. Permeability is very rapid. The natural vegetation is a sand pine scrub/sandhill forest with an understory of cacti, lichens and scattered saw palmetto. This soil type underlies portions of the scrub and xeric hammock communities at Blue Spring.

43 - Paola fine sand, 8 to 17 % slopes - This excessively drained, strongly sloping sandy soil occurs in small areas of side slopes of sand ridges, around sinks and along streams that have high banks. The water table is below a depth of 72 inches. The natural vegetation is a sand pine scrub/sandhill forest with an understory of scattered saw palmetto, cacti, and lichens. This soil underlies a small area of xeric hammock on the eastern boundary of Blue Spring along the railroad track.

47 - Pits - Pits are excavations from which soil and geologic material have been removed for use in road construction or foundations. The two Blue Spring pits which occur north and south of French Avenue adjacent to the railroad tracks have been abandoned. Exotic plants and grasses have invaded some areas however there has been natural recruitment of slash, longleaf, and sand pines. Gopher tortoise use is extensive in these areas.

56 - Samsula muck - This is a very poorly drained, nearly level organic soil occurring in swamps, poorly defined drainageways and floodplains. The water table is at or above the soil surface except during extended dry periods. There are two areas of Samsula muck at Blue Spring one is associated with the floodplain swamp community close to the St. Johns River and Lake Beresford, the other is associated with a small depression marsh which is bisected by French Avenue.

Blue Spring State Park Park Soils Descriptions

63 – Tavares fine sand, 0 to 5% slopes – This is a nearly level, moderately well on lower slopes of hills and knolls of ridges and flatwoods. Characteristic of sandhill, slash and longleaf pine are common with various oaks and threeawn. There is one small area of this soil type at Blue Spring underlying the floodplain swamp along the edge of Lake Beresford at the northern boundary of the park.

65 - Terra Ceia muck - This is very poorly drained soil formed in organic material. It occurs in freshwater marshes. The water table is as much as 2 feet above the surface at times during the rainy season. Water is at or above the surface for 6 to 9 months in most years and is seldom below a depth of 10 inches except in extended dry periods. This soil occurs in association with floodplain marsh at Blue Spring and is quite extensive primarily north of French Landing along the St. Johns River.

69 - Tuscawilla fine sand - This is a nearly level, poorly drained soil in broad hammock areas. Undisturbed areas are characterized by micro-relief of fairly closely spaced, low broad rises or mounds which are a few feet to more than 100 feet across, irregular in shape, and about 4 to 6 inches above the general level of the surrounding area. The water table is within a depth of 10 inches for 2 to 6 months in most years. There are two small areas of this soil type at Blue Spring underlying the mesic hammock of the eastern and western side of the spring run.

72 - Valkaria fine sand - This fine sand is a nearly level, poorly drained, sandy soil occurring in broad, poorly defined drainage ways and areas bordering swamps. The water is at or near the surface for as much as 6 months in most years. This soil type underlies a portion of the floodplain marsh and hydric hammock along the eastern edge of the lagoon at Blue Spring.

99 - Water -

**Blue Spring State Park
Park Soils Descriptions**

Addendum 5—Plant and Animal List

Amphibians

Common Name	Scientific Name/
Florida Cricket Frog	<i>Acris gryllus</i>
Two-toed amphiuma	<i>Amphiuma means</i>
Oak toad	<i>Bufo quercicus</i>
Southern toad	<i>Bufo terrestris</i>
Greenhouse Frog	<i>Eleutherodactylus planirostris</i>
Dwarf salamander	<i>Eurycea quadridigitata</i>
Eastern narrow-mouthed toad	<i>Gastrophryne carolinensis</i>
Green treefrog	<i>Hyla cinera</i>
Squirrel treefrog	<i>Hyla squirella</i>
Pig Frog	<i>Lithobates grylio</i>
Peninsula newt	<i>Notophthalmus viridescens piaropicola</i>
Cuban treefrog	<i>Osteopilus septentrionalis*</i>
Florida gopher frog	<i>Rana capito aesopus</i> DM, SC, SCF, MF
Bullfrog	<i>Rana catesbeiana</i>
River frog	<i>Rana heckscheri</i>
Southern leopard frog	<i>Rana sphenoccephala</i>
Florida leopard frog	<i>Rana utricularia sphenoccephala</i>
Eastern spadefoot toad	<i>Scaphiopus holbrookii</i>
Greater siren	<i>Siren lacertina</i>

Angiosperm

Common Name	Scientific Name
Slender threeseed mercury	<i>Acalypha gracilens</i>
Boxelder	<i>Acer negundo</i>
Red maple	<i>Acer rubrum</i>
Mimosa	<i>Albizia julibrissin*</i>
Alligatorweed	<i>Alternanthera philoxeroides*</i>
Strangler daisy	<i>Alyptocarpus vialis</i>
Common ragweed	<i>Ambrosia artemisiifolia</i>
Bastard false indigo	<i>Amorpha fruticosa</i>
Peppervine	<i>Ampelopsis arborea</i>
Bushy bluestem	<i>Andropogon glomeratus var. pumilus</i>
Chalky bluestem	<i>Andropogon virginicus var. glaucus</i>
Groundnut	<i>Apios americana</i>
Devil's walkingstick	<i>Aralia spinosa</i>
Scratchthroat	<i>Ardisia crenata*</i>
Jack-in-the-pulpit	<i>Arisaema triphyllum</i>

Bottlebrush threeawn	<i>Aristida spiciformis</i>
Wiregrass	<i>Aristida stricta</i> var. <i>beyrichiana</i>
Florida Indian plantain	<i>Arnoglossum floridanum</i>
Switchcane	<i>Arundinaria gigantea</i>
Curtiss's milkweed	<i>Asclepias curtissii</i> SC
Swamp milkweed	<i>Asclepias incarnata</i> (<i>Asclepias perennis</i>)
SAVANNAH MILKWEED	<i>Asclepias pedicellata</i>
Velvetleaf milkweed	<i>Asclepias tomentosa</i>
Woolly pawpaw	<i>Asimina incana</i>
Bigflower pawpaw	<i>Asimina obovata</i>
Smallflower pawpaw	<i>Asimina parviflora</i>
Netted pawpaw	<i>Asimina reticulata</i>
Common asparagus-fern	<i>Asparagus setaceus</i> *
Big carpetgrass	<i>Axonopus furcatus</i>
Silverling	<i>Baccharis glomeruliflora</i>
Groundsel tree	<i>Baccharis halimifolia</i>
Herb-of-grace	<i>Bacopa monnieri</i>
Common bamboo	<i>Bambusa vulgaris</i> *
Orchid tree	<i>Bauhinia variegata</i> *
Tarflower	<i>Bejaria racemosa</i>
Rattan vine	<i>Berchemia scandens</i>
Florida greeneyes	<i>Berlandiera subcaulis</i>
Beggarticks (Spanish needles)	<i>Bidens alba</i>
Crossvine	<i>Bignonia capreolata</i>
Bog hemp	<i>Boehmeria cylindrica</i>
American bluehearts	<i>Buchnera americana</i>
Capillary hairsedge	<i>Bulbostylis ciliatifolia</i>
northern bluethread	<i>Burmannia biflora</i>
American beautyberry	<i>Callicarpa americana</i>
Florida scrub roseling	<i>Callisia ornata</i>
Grasspink	<i>Calopogon</i> sp.
Straggler daisy	<i>Calypocarpus vialis</i> *
Hedge false bindweed	<i>Calystegia sepium</i> subsp. <i>limnophila</i>
Trumpet creeper	<i>Campsis radicans</i>
Hammock sedge	<i>Carex fissa</i> var. <i>aristata</i>
Long's sedge	<i>Carex longii</i>
False hop sedge	<i>Carex lupuliformis</i>
Awlfruit sedge	<i>Carex stipata</i>
Florida paintbrush	<i>Carphephorus corymbosus</i>
Vanillaleaf	<i>Carphephorus odoratissimus</i>
American hornbeam	<i>Carpinus caroliniana</i>

Wild olive	<i>Cartrema americanus (floridanum)</i>
Scrub wild olive	<i>Cartrema floridana</i>
Water hickory	<i>Carya aquatica</i>
Scrub hickory	<i>Carya floridana</i>
Pignut hickory	<i>Carya glabra</i>
Pecan	<i>Carya illinoensis*</i>
Mockernut hickory	<i>Carya tomentosa</i>
Southern catalpa	<i>Catalpa bignonioides</i>
Hackberry	<i>Celtis laevigata</i>
Coastal sandbur	<i>Cenchrus spinifex</i>
Spadeleaf	<i>Centella asiatica</i>
Spurred butterfly pea	<i>Centrosema virginianum</i>
Common buttonbush	<i>Cephalanthus occidentalis</i>
Florida rosemary	<i>Ceratiola ericoides</i>
Coontail	<i>Ceratophyllum demersum</i>
Eastern redbud	<i>Cercis canadensis</i>
Partridge pea	<i>Chamaecrista fasciculata</i>
Pillpod sandmat	<i>Chamaesyce hirta</i>
Hyssopleaf sandmat	<i>Chamaesyce hyssopifolia</i>
Spotted sandmat	<i>Chamaesyce maculata</i>
Longleaf woodoats	<i>Chasmanthium laxum var. sessiliflorum</i>
Camphortree	<i>Cinnamomum camphora*</i>
Purple thistle	<i>Cirsium horridulum</i>
Nuttall's thistle	<i>Cirsium nuttallii</i>
Tangerine	<i>Citrus reticulata.*</i>
Hardy orange	<i>Citrus trifoliata</i>
Sweet/sour orange/grapefruit	<i>Citrus x aurantium.*</i>
Virginsbower	<i>Clematis virginiana</i>
Turk's turban	<i>Clerodendrum indicum*</i>
Atlantic pigeonwings	<i>Clitoria mariana</i>
Tread-softly	<i>Cnidocolus stimulosus</i>
Carolina coralbead	<i>Cocculus carolinus</i>
Wild taro	<i>Colocasia esculenta*</i>
Common dayflower	<i>Commelina diffusa</i>
Whitemouth dayflower	<i>Commelina erecta</i>
Blue mistflower	<i>Conoclinium coelestinum</i>
American squawroot	<i>Conopholis americana</i>
Canadian horseweed	<i>Conyza canadensis</i>
Coastalplain tickseed	<i>Coreopsis gladiata</i>
Common tickseed	<i>Coreopsis leavenworthii</i>
Flowering dogwood	<i>Cornus florida</i>

Swamp dogwood	<i>Cornus foemina</i>
String-lily	<i>Crinum americanum</i>
Rabbitbells	<i>Crotalaria rotundifolia</i>
Showy rattlebox	<i>Crotalaria spectabilis*</i>
Vente conmigo	<i>Croton glandulosus</i>
Okeechobee gourd	<i>Cucurbita okeechobeensis FS, FM</i>
COLOMBIAN WAXWEED	<i>Cuphea carthagenensis*</i>
Dodder	<i>Cuscuta sp.</i>
Baldwin's flatsedge	<i>Cyperus croceus</i>
Swamp flatsedge	<i>Cyperus distinctus</i>
Haspan flatsedge	<i>Cyperus haspan</i>
Umbrella plant	<i>Cyperus involucreatus*</i>
Fragrant flatsedge	<i>Cyperus odoratus</i>
Pinebarren flatsedge	<i>Cyperus ovatus</i>
Manyfinger flatsedge	<i>Cyperus polystachyos</i>
Nutgrass	<i>Cyperus rotundus</i>
Tropical flatsedge	<i>Cyperus surinamensis</i>
Durban crowfootgrass	<i>Dactyloctenium aegyptium*</i>
Feay's prairieclover	<i>Dalea feayi</i>
Zarabacoa	<i>Desmodium incanum</i>
Panicled ticktrefoil	<i>Desmodium paniculatum</i>
Threeflower ticktrefoil	<i>Desmodium triflorum*</i>
Variable witchgrass	<i>Dicanthelium commutatum</i>
Cypress witchgrass	<i>Dicanthelium ensifolium</i>
Erectleaf witchgrass	<i>Dicanthelium erectifolium</i>
Openflower witchgrass	<i>Dicanthelium laxiflorum</i>
Hemlock witchgrass	<i>Dicanthelium portoricense</i>
Carolina ponysfoot	<i>Dichondra carolinensis</i>
White Star Grass	<i>Dichromena latifolia</i>
Southern crabgrass	<i>Digitaria ciliaris</i>
Rough buttonweed	<i>Diodia teres</i>
Virginia buttonweed	<i>Diodia virginiana</i>
Air-potato	<i>Dioscorea bulbifera*</i>
Common persimmon	<i>Diospyros virginiana</i>
Sundew	<i>Drosera sp.</i>
West Indian chickweed	<i>Drymaria cordata</i>
Barnyardgrass	<i>Echinochloa crus-galli*</i>
Coast cockspur	<i>Echinochloa walteri</i>
Common water-hyacinth	<i>Eichhornia crassipes*</i>
Baldwin's spikerush	<i>Eleocharis baldwinii</i>
Viviparous spikerush	<i>Eleocharis vivipara</i>

Carolina elephantsfoot	<i>Elephantopus carolinianus</i>
Tall elephantsfoot	<i>Elephantopus elatus</i>
Indian goosegrass	<i>Eleusine indica*</i>
Lilac tasselflower	<i>Emilia sonchifolia</i>
Florida butterfly orchid	<i>Encyclia tampense</i>
Green-fly orchid	<i>Epidendrum conopseum</i> FS, MEH,SRST, BST, HH
Elliott's lovegrass	<i>Eragrostis elliottii</i>
Fireweed	<i>Erechtites hieraciifolius</i>
Oakleaf fleabane	<i>Erigeron quercifolius</i>
Loquat	<i>Eriobotrya japonica*</i>
Flattened pipewort	<i>Eriocaulon compressum</i>
BALDWIN'S ERYNGO	<i>Eryngium baldwinii</i>
Creeping eryngo	<i>Eryngium prostratum</i>
Coralbean	<i>Erythrina herbacea</i>
American strawberrybush	<i>Euonymus americanus</i>
Dogfennel	<i>Eupatorium capillifolium</i>
Mohr's thoroughwort	<i>Eupatorium mohrii</i>
Roundleaf thoroughwort	<i>Eupatorium rotundifolium</i>
Climbing False Buckwheat	<i>Fallopia scandens</i>
Pop ash	<i>Fraxinus caroliniana</i>
Saltmarsh umbrellasedge	<i>Fuirena breviseta</i>
white twinevine	<i>Funastrum clausum</i>
Elliott's milkpea	<i>Galactia elliottii</i>
Downy milkpea	<i>Galactia regularis</i>
Coastal bedstraw	<i>Galium hispidulum</i>
Stiff marsh bedstraw	<i>Galium tinctorium</i>
Caribbean purple everlasting	<i>Gamochaeta antillana</i>
Pennsylvania cudweed	<i>Gamochaeta pennsylvanica*</i>
Garberia	<i>Garberia heterophylla</i> SC
Southern beeblossom	<i>Gaura angustifolia</i>
Dwarf huckleberry	<i>Gaylussacia dumosa</i>
Blue huckleberry	<i>Gaylussacia frondosa</i> var. <i>tomentosa</i>
Yellow jessamine	<i>Gelsemium sempervirens</i>
Gopher apple	<i>Geobalanus oblongifolius</i>
Carolina cranesbill	<i>Geranium carolinianum</i>
Water locust	<i>Gleditsia aquatica</i>
Angularfruit milkvine	<i>Gonolobus suberosus</i> FS, SHM
Loblolly bay	<i>Gordonia lasianthus</i>
Rough hedgehyssop	<i>Gratiola hispida</i>
Button burrweed	<i>Gymnostyles anthemifolia*</i>
Mignonette orchid	<i>Habenaria floribunda</i>

Carolina frostweed	<i>Helianthemum carolinianum</i>
Pinebarren frostweed	<i>Helianthemum corymbosu</i>
Swamp sunflower	<i>Helianthus angustifolius</i>
Tanglehead	<i>Heteropogon contortus*</i>
Sweet tanglehead	<i>Heteropogon melanocarpus*</i>
Camphorweed	<i>Heterotheca subaxillaris</i>
Scarlet rosemallow	<i>Hibiscus coccineus</i>
Swamp rosemallow	<i>Hibiscus grandiflorus</i>
Innocence	<i>Houstonia procumbens</i>
Hydrilla	<i>Hydrilla verticillata*</i>
Floating marshpennywort	<i>Hydrocotyle ranunculoides</i>
Manyflower marshpennywort	<i>Hydrocotyle umbellata</i>
Whorled marshpennywort	<i>Hydrocotyle verticillata</i>
Roundpod St. John's-wort	<i>Hypericum cistifolium</i>
St. Peter's-wort	<i>Hypericum crux-andreae</i>
Sandweed	<i>Hypericum fasciculatum</i>
St. Andrew's-cross	<i>Hypericum hypericoides</i>
Dwarf St. John's-wort	<i>Hypericum mutilum</i>
Atlantic St. John's-wort	<i>Hypericum tenuifolium</i>
Fourpetal St. John's-wort	<i>Hypericum tetrapetalum</i>
Fringed yellow stargrass	<i>Hypoxis juncea</i>
Musky mint	<i>Hyptis alata</i>
Tropical bushmint	<i>Hyptis mutabilis*</i>
Carolina holly	<i>Ilex ambigua</i>
Dahoon	<i>Ilex cassine</i>
Gallberry	<i>Ilex glabra</i>
American holly	<i>Ilex opaca</i>
Scrub holly	<i>Ilex opaca var. arenicola</i>
Yaupon	<i>Ilex vomitoria</i>
Cogongrass	<i>Imperata cylindrica*</i>
Carolina indigo	<i>Indigofera caroliniana</i>
Hairy indigo	<i>Indigofera hirsuta*</i>
Trailing indigo	<i>Indigofera spicata*</i>
Moonflowers	<i>Ipomoea alba</i>
Tievine	<i>Ipomoea cordatotriloba*</i>
Scarlet creeper	<i>Ipomoea hederifolia</i>
wild potato vine	<i>Ipomoea pandurata*</i>
Tall morning-glory	<i>Ipomoea purpurea</i>
Saltmarsh morningglory	<i>Ipomoea sagittata</i>
Blue flag iris	<i>Iris virginica</i>
Virginia willow	<i>Itea virginica</i>

Hairy clustervine	<i>Jacquemontia tamnifolia</i>
Soft rush	<i>Juncus effusus</i> subsp. <i>solutus</i>
Grassleaf rush	<i>Juncus marginatus</i>
Needlepod rush	<i>Juncus scirpoides</i>
Virginia saltmarsh mallow	<i>Kosteletzkya pentacarpos</i>
Virginia dwarfdandelion	<i>Krigia virginica</i>
Carolina redroot	<i>Lachnanthes caroliana</i>
Whitehead bogbutton	<i>Lachnocaulon anceps</i>
Woodland lettuce	<i>Lactuca floridana</i>
Grassleaf lettuce	<i>Lactuca graminifolia</i>
Crapemyrtle	<i>Lagerstroemia indica</i> *
Lantana	<i>Lantana camara</i> *
Deckert's pinweed	<i>Lechea deckertii</i>
Piedmont pinweed	<i>Lechea torreyi</i>
Southern cutgrass	<i>Leersia hexandra</i>
Whitegrass	<i>Leersia virginica</i>
Common duckweed	<i>Lemna minor</i> (<i>Spirodela polyrhiza</i>)
Virginia pepperweed	<i>Lepidium virginicum</i>
Shortleaf gayfeather	<i>Liatris tenuifolia</i> var. <i>quadriflora</i>
Chinese privet	<i>Ligustrum sinense</i> *
Canadian toadflax	<i>Linaria canadensis</i>
Apalachicola toadflax	<i>Linaria floridana</i>
Sweetgum	<i>Liquidambar styraciflua</i>
Lobelia	<i>Lobelia</i> sp.
Japanese honeysuckle	<i>Lonicera japonica</i> *
Seaside primrosewillow	<i>Ludwigia maritima</i>
Smallfruit primrosewillow	<i>Ludwigia microcarpa</i>
Mexican primrosewillow	<i>Ludwigia octovalvis</i>
Marsh seedbox	<i>Ludwigia palustris</i>
Peruvian primrosewillow	<i>Ludwigia peruviana</i> *
Creeping primrosewillow	<i>Ludwigia repens</i>
Skyblue lupine	<i>Lupinus diffusus</i>
Southern watergrass	<i>Luziola fluitans</i>
Japanese climbing fern	<i>Lygodium japonicum</i> *
Rusty staggerbush	<i>Lyonia ferruginea</i>
Coastalplain staggerbush	<i>Lyonia fruticosa</i>
Fetterbush	<i>Lyonia lucida</i>
Piedmont staggerbush	<i>Lyonia mariana</i>
Winged loosestrife	<i>Lythrum alatum</i> var. <i>lanceolatum</i>
Southern magnolia	<i>Magnolia grandiflora</i>
Sweetbay	<i>Magnolia virginiana</i>

Black medick	<i>Medicago lupulina*</i>
Chinaberry	<i>Melia azedarach*</i>
White sweetclover	<i>Melilotus albus*</i>
Rose natalgrass	<i>Melinis repens*</i>
Creeping cucumber	<i>Melothria pendula</i>
Noyau vine	<i>Merremia dissecta*</i>
Florida Keys hempvine	<i>Mikania cordifolia</i>
Climbing hempvine	<i>Mikania scandens</i>
Four-o'clock	<i>Mirabilis jalapa*</i>
Partridgeberry	<i>Mitchella repens</i>
Spotted beebalm	<i>Monarda punctata</i>
Indianpipe	<i>Monotropa uniflora</i>
Red mulberry	<i>Morus rubra</i>
Wax myrtle	<i>Myrica cerifera</i>
Southern water nymph	<i>Najas guadalupensis</i>
Heavenly bamboo	<i>Nandina domestica*</i>
Spatterdock	<i>Nuphar advena</i>
Yellow waterlily	<i>Nymphaea mexicana</i>
American white waterlily	<i>Nymphaea odorata</i>
Swamp tupelo	<i>Nyssa sylvatica var. biflora</i>
Whitetop aster	<i>Oclemena reticulata</i>
Cutleaf eveningprimrose	<i>Oenothera laciniata</i>
Basketgrass	<i>Oplismenus hirtellus</i>
Pricklypear	<i>Opuntia humifusa</i>
Shell-mound pricklypear	<i>Opuntia stricta SC</i>
Common yellow woodsorrel	<i>Oxalis corniculata</i>
Pink woodsorrel	<i>Oxalis debilis</i>
Violet woodsorrel	<i>Oxalis violacea</i>
Butterweed	<i>Packera glabella</i>
Beaked panicum	<i>Panicum anceps</i>
Maidencane	<i>Panicum hemitomom</i>
Guineagrass	<i>Panicum maximum*</i>
Torpedograss	<i>Panicum repens*</i>
Redtop panicum	<i>Panicum rigidulum</i>
Florida pellitory	<i>Parietaria floridana</i>
Virginia creeper	<i>Parthenocissus quinquefolia</i>
Florida paspalum	<i>Paspalum floridanum</i>
Bahiagrass	<i>Paspalum notatum var. sauriae*</i>
Water paspalum	<i>Paspalum repens</i>
Thin paspalum	<i>Paspalum setaceum</i>
Vaseygrass	<i>Paspalum urvillei*</i>

Purple passionflower	<i>Passiflora incarnata</i>
Gulf Coast Swallowwort	<i>Pattalia palustre</i>
Spreading cinchweed	<i>Pectis prostrata</i>
White arrow arum	<i>Peltandra sagittifolia</i>
Green arrow arum	<i>Peltandra virginica</i>
Napierglass	<i>Pennisetum purpureum*</i>
Red bay	<i>Persea borbonia</i>
Silk bay	<i>Persea borbonia var. humilis</i>
Swamp bay	<i>Persea palustris</i>
Savannah panicum	<i>Phanopyrum gymnocarpon</i>
Annual phlox	<i>Phlox drummondii*</i>
Oak mistletoe	<i>Phoradendron leucarpum</i>
Red chokeberry	<i>Photinia pyrifolia</i>
Common reed	<i>Phragmites australis</i>
Turkey tangle fogfruit	<i>Phyla nodiflora</i>
Mascarene island leafflower	<i>Phyllanthus tenellus*</i>
Chamber bitter	<i>Phyllanthus urinaria*</i>
Golden bamboo	<i>Phyllostachys aurea*</i>
Walter's groundcherry	<i>Physalis walteri</i>
American pokeweed	<i>Phytolacca americana</i>
Wild pennyroyal	<i>Piloblephis rigida</i>
Small butterwort	<i>Pinguicula pumila</i>
Water-lettuce	<i>Pistia stratiotes*</i>
Narrowleaf silkgrass	<i>Pityopsis graminifolia</i>
Waterelm	<i>Planera aquatica</i>
Southern plantain	<i>Plantago virginica</i>
Rosy camphorweed	<i>Pluchea baccharis</i>
Longleaf camphorweed	<i>Pluchea longifolia</i>
Sweetscent	<i>Pluchea odorata</i>
Paintedleaf	<i>Poinsettia cyathophora</i>
Fiddler's spurge	<i>Poinsettia heterophylla</i>
Procession flower	<i>Polygala incarnata</i>
yellow milkwort	<i>Polygala lutea</i>
Candyroot	<i>Polygala nana</i>
Rugel's milkwort	<i>Polygala rugelii</i>
Coastal plain milkwort	<i>Polygala setacea</i>
Tall jointweed	<i>Polygonella gracilis</i>
October flower	<i>Polygonella polygama</i>
Swamp smartweed	<i>Polygonum hydropiperoides</i>
Rabbitsfootgrass	<i>Polypogon monspeliensis*</i>
Rustweed	<i>Polypremum procumbens</i>

Pickernelweed	<i>Pontederia cordata</i>
Pink purslane	<i>Portulaca pilosa</i>
Waterthread pondweed	<i>Potamogeton diversifolius</i>
Illinois pondweed	<i>Potamogeton illinoensis</i>
Pouzolz's bush	<i>Pouzolzia zeylanica*</i>
Carolina laurelcherry	<i>Prunus caroliniana</i>
Black cherry	<i>Prunus serotina</i>
Flatwoods plum	<i>Prunus umbelata</i>
sweet everlasting	<i>Pseudognaphalium obtusifolium</i>
Wild coffee	<i>Psychotria nervosa</i>
Blackroot	<i>Pterocaulon pycnostachyum</i>
Mock bishopsweed	<i>Ptilimnium capillaceum</i>
Kudzu	<i>Pueraria montana var. lobata*</i>
Carolina desertchicory	<i>Pyrrhopappus carolinianus</i>
Chapman's oak	<i>Quercus chapmanii</i>
Sand live oak	<i>Quercus geminata</i>
Laurel oak	<i>Quercus laurifolia</i>
Dwarf live oak	<i>Quercus minima</i>
Myrtle oak	<i>Quercus myrtifolia</i>
Water oak	<i>Quercus nigra</i>
Running oak	<i>Quercus pumila</i>
Live oak	<i>Quercus virginiana</i>
Blue Palmetto Needle Palm	<i>Rhapidophyllum hystrix</i>
Maid Marian	<i>Rhexia nashii</i>
Nuttall's meadowbeauty	<i>Rhexia nuttallii</i>
Ciliate Meadow-beauty	<i>Rhexia petiolata</i>
Winged sumac	<i>Rhus copallinum</i>
Least snoutbean	<i>Rhynchosia minima</i>
Starrush whitetop	<i>Rhynchospora colorata</i>
Fascicled beaksedge	<i>Rhynchospora fascicularis</i>
Giant whitetop	<i>Rhynchospora latifolia</i>
Sandyfield beaksedge	<i>Rhynchospora megalocarpa</i>
Southern beaksedge	<i>Rhynchospora microcarpa</i>
Shortbeak beaksedge	<i>Rhynchospora nitens</i>
Tropical Mexican clover	<i>Richardia brasiliensis*</i>
Rough Mexican clover	<i>Richardia scabra*</i>
Itchgrass	<i>Rottboellia cochinchinensis*</i>
Sand blackberry	<i>Rubus cuneifolius</i>
Sawtooth blackberry	<i>Rubus pensilvanicus</i>
Southern dewberry	<i>Rubus trivialis</i>
Carolina wild petunia	<i>Ruellia caroliniensis</i>

Heartwing dock	<i>Rumex hastatulus</i>
Swamp dock	<i>Rumex verticillatus</i>
Scrub palmetto	<i>Sabal etonia</i>
Dwarf palmetto	<i>Sabal minor</i>
Cabbage palm	<i>Sabal palmetto</i>
Rosepink	<i>Sabatia angularis</i>
Shortleaf rosegentian	<i>Sabatia brevifolia</i>
COASTAL ROSEGENTIAN	<i>Sabatia calycina</i>
marsh pin	<i>Sabatia stellaris</i>
Smallflower mock buckthorn	<i>Sageretia minutiflora</i>
Bulltongue arrowhead	<i>Sagittaria lancifolia</i>
Duck potato	<i>Sagittaria latifolia</i>
Carolina willow	<i>Salix caroliniana</i>
Lyreleaf sage	<i>Salvia lyrata</i>
Water spangles	<i>Salvinia minima*</i>
Elderberry	<i>Sambucus nigra L. subsp. canadensis</i>
Pineland pimpernel	<i>Samolus valerandi L. subsp. parviflorus</i>
Soapberry	<i>Sapindus saponaria</i>
Chinese tallowtree	<i>Sapium sebiferum*</i>
Lizard's tail	<i>Saururus cernuus</i>
Softstem bullrush	<i>Schoenoplectus tabernaemontani</i>
Woolgrass	<i>Scirpus cyperinus</i>
Drooping bullrush	<i>Scirpus lineatus</i>
Fringed nutrush	<i>Scleria ciliata</i>
Tall nutgrass	<i>Scleria triglomerata</i>
Saw palmetto	<i>Serenoa repens</i>
Bagpod	<i>Sesbania vesicaria</i>
Comb Black-senna	<i>Seymeria pectinata</i>
Gum bully	<i>Sideroxylon lanuginosum</i>
Tough bully	<i>Sideroxylon tenax</i>
Sleepy catchfly	<i>Silene antirrhina</i>
Narrowleaf blue-eyed grass	<i>Sisyrinchium angustifolium</i>
Hairy leafcup	<i>Smallanthus uvedalia</i>
Earleaf greenbrier	<i>Smilax auriculata</i>
Saw greenbrier	<i>Smilax bona-nox</i>
Wild sarsaparilla	<i>Smilax glauca</i>
Laurel greenbrier	<i>Smilax laurifolia</i>
Sarsaparilla vine	<i>Smilax pumila</i>
Bristly greenbrier	<i>Smilax tamnoides</i>
American black nightshade	<i>Solanum americanum</i>
Tropical soda apple	<i>Solanum viarum*</i>

Chapman's goldenrod	<i>Solidago odora var. chapmanii</i>
Spiny sowthistle	<i>Sonchus asper*</i>
Common sowthistle	<i>Sonchus oleraceus*</i>
Johnsongrass	<i>Sorghum halepense*</i>
Sand cordgrass	<i>Spartina bakeri</i>
Roughfruit scaleseed	<i>Spermolepis divaricata</i>
Spring ladiestresses	<i>Spiranthes vernalis</i>
Smutgrass	<i>Sporobolus indicus*</i>
Florida hedgenettle	<i>Stachys floridana</i>
Common chickweed	<i>Stellaria media*</i>
Fuzzybean	<i>Strophostyles sp.</i>
Sago pondweed	<i>Stuckenia pectinata</i>
Climbing aster	<i>Symphotrichum carolinianum</i>
Yellow hatpins	<i>Syngonanthus flavidulus</i>
American germander	<i>Teucrium canadense</i>
Alligatorflag	<i>Thalia geniculata</i>
Bartram's airplant	<i>Tillandsia bartramii</i>
Ballmoss	<i>Tillandsia recurvata</i>
Florida airplant	<i>Tillandsia simulata</i>
Spanish moss	<i>Tillandsia usneoides</i>
Giant airplant	<i>Tillandsia utriculata</i> SRST, FS, MEH, HH
Eastern poison ivy	<i>Toxicodendron radicans</i>
Ohio spiderwort	<i>Tradescantia ohiensis</i>
Longleaf spiderwort	<i>Tradescantia roseolens</i>
Virginia marsh St. John's-wort	<i>Triadenum virginicum</i>
Forked bluecurls	<i>Trichostema dichotomum</i>
Tall redtop	<i>Tridens flavus</i>
Clasping Venus' looking-glass	<i>Triodanis perfoliata</i>
Purple sandgrass	<i>Triplasis purpurea</i>
Eastern gamagrass	<i>Tripsacum dactyloides</i>
Southern cattail	<i>Typha domingensis</i>
Broadleaf cattail	<i>Typha latifolia</i>
American elm	<i>Ulmus americana</i>
Caesarweed	<i>Urena lobata*</i>
Tropical signalgrass	<i>Urochloa distachya*</i>
Paragrass	<i>Urochloa mutica*</i>
Bladderwort	<i>Utricularia sp.</i>
Sparkleberry	<i>Vaccinium arboreum</i>
Highbush blueberry	<i>Vaccinium corymbosum</i>
Shiny blueberry	<i>Vaccinium myrsinites</i>
Deerberry	<i>Vaccinium stamineum</i>

American eelgrass	<i>Vallisneria americana</i>
Texas vervain	<i>Verbena officinalis subsp. halei</i>
Sandpaper vervain	<i>Verbena scabra</i>
Frostweed	<i>Verbesina virginica</i>
Tall ironweed	<i>Vernonia angustifolia</i>
Giant ironweed	<i>Vernonia gigantea</i>
Walter's viburnum	<i>Viburnum obovatum</i>
Fourleaf vetch	<i>Vicia acutifolia</i>
Florida vetch	<i>Vicia floridana</i>
Hairy pod cowpea	<i>Vigna luteola</i>
Bog white violet	<i>Viola lanceolata</i>
Primroseleaf violet	<i>Viola primulifolia</i>
Common blue violet	<i>Viola sororia</i>
Summer grape	<i>Vitis aestivalis</i>
Muscadine	<i>Vitis rotundifolia</i>
Chinese wisteria	<i>Wisteria sinensis*</i>
Mudmidget	<i>Wolffiella spp.</i>
Coastalplain yelloweyed grass	<i>Xyris ambigua</i>
Shortleaf yelloweyed grass	<i>Xyris brevifolia</i>
Carolina yelloweyed grass	<i>Xyris caroliniana</i>
Oriental false hawkbeard	<i>Youngia japonica*</i>
Spanish bayonet	<i>Yucca aloifolia</i>
Adam's needle	<i>Yucca filamentosa</i>
Coontie	<i>Zamia pumila</i>

Birds

Common Name	Scientific Name
Cooper's hawk	<i>Accipiter cooperii</i>
Sharp-shinned hawk	<i>Accipiter striatus</i>
Spotted sandpiper	<i>Actitis macularius</i>
Red-winged blackbird	<i>Agelaius phoeniceus</i>
Wood Duck	<i>Aix sponsa</i>
Henslow's sparrow	<i>Ammodramus henslowii</i>
Grasshopper sparrow	<i>Ammodramus savannarum</i>
American Wigeon	<i>Anas americana</i>
Northern Shoveler	<i>Anas clypeata</i>
Blue-winged teal	<i>Anas discors</i>
Mottled Duck	<i>Anas fulvigula</i>
Mallard	<i>Anas platyrhynchos</i>
Anhinga	<i>Anhinga anhinga</i>

Florida Scrub Jay	<i>Aphelocoma coerulescens</i> SC
Limpkin	<i>Aramus guarauna</i> BST, SRST, RFLK, SULK
Ruby-throated hummingbird	<i>Archilochus colubris</i>
Great egret	<i>Ardea alba</i>
Great blue heron	<i>Ardea herodias</i>
Lesser Scaup	<i>Aythya affinis</i>
Tufted Titmouse	<i>Baeolophus bicolor</i>
Cedar waxwing	<i>Bombycilla cedrorum</i>
American bittern	<i>Botaurus lentiginosus</i>
Great horned owl	<i>Bubo virginianus</i>
Cattle egret	<i>Bubulcus ibis</i>
Red-tailed hawk	<i>Buteo jamaicensis</i>
Red-shouldered hawk	<i>Buteo lineatus</i>
Broad-winged hawk	<i>Buteo platypterus</i>
Green heron	<i>Butorides virescens</i>
Chuck-will's-widow	<i>Caprimulgus carolinensis</i>
Whip-poor-will	<i>Caprimulgus vociferus</i>
Canada warbler	<i>Cardellina canadensis</i>
Wilson's warbler	<i>Cardellina pusilla</i>
Northern cardinal	<i>Cardinalis cardinalis</i>
Purple Finch	<i>Carpodacus purpureus</i>
Turkey vulture	<i>Cathartes aura</i>
Veery	<i>Catharus fuscescens</i>
Hermit thrush	<i>Catharus guttatus</i>
Gray-cheeked thrush	<i>Catharus minimus</i>
Swainson's thrush	<i>Catharus ustulatus</i>
Chimney swift	<i>Chaetura pelagica</i>
Killdeer	<i>Charadrius vociferus</i>
Common nighthawk	<i>Chordeiles minor</i>
Northern harrier	<i>Circus cyaneus</i>
Marsh wren	<i>Cistothorus palustris</i>
Yellow-billed cuckoo	<i>Coccyzus americanus</i>
Black-billed cuckoo	<i>Coccyzus erythrophthalmus</i>
Northern Flicker	<i>Colaptes auratus</i>
Northern bobwhite	<i>Colinus virginianus</i>
Rock pigeon	<i>Columba livia</i> *
Common ground-dove	<i>Columbina passerina</i>
Eastern wood-Pewee	<i>Contopus virens</i>
Black vulture	<i>Coragyps atratus</i>
American Crow	<i>Corvus brachyrhyncus</i>
Fish crow	<i>Corvus ossifragus</i>

Blue jay	<i>Cyanocitta cristata</i>
Bobolink	<i>Dolichonyx oryzivorus</i>
Pileated woodpecker	<i>Dryocopus pileatus</i>
Gray catbird	<i>Dumetella carolinensis</i>
Little blue heron	<i>Egretta caerulea</i> BST, RFLK, SRST
Snowy egret	<i>Egretta thula</i> BST, RFLK, SRST
Tricolored heron	<i>Egretta tricolor</i> BST, RFLK, SRST
Swallow-tailed kite	<i>Elanoides forficatus</i> HH, MF, SC, DV, DM, FM
Acadian flycatcher	<i>Empidonax virescens</i>
White ibis	<i>Eudocimus albus</i> BST, RFLK, SULK, DV
Rusty blackbird	<i>Euphagus carolinus</i>
Merlin	<i>Falco columbarius</i> SC, DV
American kestrel	<i>Falco sparverius</i>
American coot	<i>Fulica americana</i>
Common snipe	<i>Gallinago gallinago</i>
Common moorhen	<i>Gallinula chloropus</i>
Common loon	<i>Gavia immer</i>
Kentucky warbler	<i>Geothlypis formosa</i>
Common yellowthroat	<i>Geothlypis trichas</i>
Sandhill crane	<i>Grus canadensis</i> SC, HH, DV, BST, DM
Bald Eagle	<i>Haliaeetus leucocephalus</i>
Worm-eating warbler	<i>Helmitheros vermivorum</i>
Barn swallow	<i>Hirundo rustica</i>
Wood thrush	<i>Hylocichla mustelina</i>
Yellow-breasted chat	<i>Icteria virens</i>
Baltimore oriole	<i>Icterus galbula</i>
Orchard oriole	<i>Icterus spurius</i>
Mississippi kite	<i>Ictinia mississippiensis</i>
Loggerhead shrike	<i>Lanius ludovicianus</i>
Herring gull	<i>Larus argentatus</i>
Ring-billed gull	<i>Larus delawarensis</i>
Swainson's warbler	<i>Limnothlypis swainsonii</i>
Hooded Merganser	<i>Lophodytes cucullatus</i>
Belted kingfisher	<i>Megaceryle alcyon</i>
Eastern screech-owl	<i>Megascops asio</i>
Red-bellied woodpecker	<i>Melanerpes carolinus</i>
Red-Headed woodpecker	<i>Melanerpes erythrocephalus</i>
Wild Turkey	<i>Meleagris gallopavo</i>
Swamp sparrow	<i>Melospiza georgiana</i>
Song sparrow	<i>Melospiza melodia</i>
Red-breasted merganser	<i>Mergus serrator</i>

Northern mockingbird	<i>Mimus polyglottos</i>
Black-and-white warbler	<i>Mniotilta varia</i>
Brown-headed cowbird	<i>Molothrus ater</i>
Wood stork	<i>Mycteria americana</i> BST, RFLK, SULK
Great-crested flycatcher	<i>Myiarchus crinitus</i>
Black-crowned night-heron	<i>Nycticorax nycticorax</i>
Yellow-crowned night-heron	<i>Nyctanassa violacea</i>
Connecticut warbler	<i>Oporornis agilis</i>
Orange-crowned warbler	<i>Oreothlypis celata</i>
Tennessee warbler	<i>Oreothlypis peregrina</i>
Osprey	<i>Pandion haliaetus</i>
Louisiana waterthrush	<i>Parkesia motacilla</i>
Northern waterthrush	<i>Parkesia noveboracensis</i>
Savannah sparrow	<i>Passerculus sandwichensis</i>
House sparrow	<i>Passer domesticus*</i>
Fox sparrow	<i>Passerella iliaca</i>
Blue grosbeak	<i>Passerina caerulea</i>
Painted bunting	<i>Passerina ciris</i>
Indigo bunting	<i>Passerina cyanea</i>
American White Pelican	<i>Pelecanus erythrorhynchos</i>
Brown pelican	<i>Pelecanus occidentalis</i> SRST
Bachman's sparrow	<i>Peucaea aestivalis</i>
Double-crested cormorant	<i>Phalacrocorax auritus</i>
Rose-breasted grosbeak	<i>Pheucticus ludovicianus</i>
Downy woodpecker	<i>Picoides pubescens</i>
Hairy Woodpecker	<i>Picoides villosus</i>
Eastern towhee	<i>Pipilo erythrophthalmus</i>
Scarlet tanager	<i>Piranga olivacea</i>
Summer tanager	<i>Piranga rubra</i>
Glossy Ibis	<i>Plegadis falcinellus</i>
Pied-billed grebe	<i>Podilymbus podiceps</i>
Carolina Chickadee	<i>Poecile carolinensis</i>
Blue-gray gnatcatcher	<i>Polioptila caerulea</i>
Vesper sparrow	<i>Poocetes gramineus</i>
Purple gallinule	<i>Porphyrio martinica</i>
Sora	<i>Porzana carolina</i>
Purple martin	<i>Progne subis</i>
Prothonotary warbler	<i>Protonotaria citrea</i>
Boat-tailed grackle	<i>Quiscalus major</i>
Common grackle	<i>Quiscalus quiscula</i>
King rail	<i>Rallus elegans</i>

Virginia Rail	<i>Rallus limicola</i>
Ruby-crowned kinglet	<i>Regulus calendula</i>
Golden-crowned kinglet	<i>Regulus satrapa</i>
Eastern phoebe	<i>Sayornis phoebe</i>
American Woodcock	<i>Scolopax minor</i>
Ovenbird	<i>Seiurus aurocapilla</i>
Northern parula	<i>Setophaga americana</i>
Black-throated blue warbler	<i>Setophaga caerulescens</i>
Bay-breasted warbler	<i>Setophaga castanea</i>
Hooded warbler	<i>Setophaga citrina</i>
Yellow-rumped warbler (Myrtle)	<i>Setophaga coronata</i>
Prairie warbler	<i>Setophaga discolor</i>
Yellow-throated warbler	<i>Setophaga dominica</i>
Blackburnian warbler	<i>Setophaga fusca</i>
Magnolia warbler	<i>Setophaga magnolia</i>
Palm warbler(Western & Yellow)	<i>Setophaga palmarum</i>
Chestnut-sided warbler	<i>Setophaga pensylvanica</i>
Yellow warbler	<i>Setophaga petechia</i>
Pine warbler	<i>Setophaga pinus</i>
American redstart	<i>Setophaga ruticilla</i>
Blackpoll warbler	<i>Setophaga striata</i>
Cape May warbler	<i>Setophaga tigrina</i>
Black-throated green warbler	<i>Setophaga virens</i>
Eastern Bluebird	<i>Sialia sialis</i>
Red-breasted nuthatch	<i>Sitta canadensis</i>
Brown-headed nuthatch	<i>Sitta pusilla</i>
Yellow-bellied sapsucker	<i>Sphyrapicus varius</i>
American goldfinch	<i>Spinus tristis</i>
Chipping sparrow	<i>Spizella passerina</i>
Field sparrow	<i>Spizella pusilla</i>
Northern rough-winged swallow	<i>Stelgidopteryx serripennis</i>
Caspian tern	<i>Sterna caspia</i>
Forster's tern	<i>Sterna forsteri</i>
Barred Owl	<i>Strix varia</i>
Eastern meadowlark	<i>Sturnella magna</i>
European starling	<i>Sturnus vulgaris*</i>
Tree swallow	<i>Tachycineta bicolor</i>
Carolina wren	<i>Thryothorus ludovicianus</i>
Brown thrasher	<i>Toxostoma rufum</i>
Solitary sandpiper	<i>Tringa solitaria</i>
House wren	<i>Troglodytes aedon</i>

Winter wren	<i>Troglodytes hiemalis</i>
American robin	<i>Turdus migratorius</i>
Eastern kingbird	<i>Tyrannus tyrannus</i>
Barn Owl	<i>Tyto alba</i>
Golden-winged warbler	<i>Vermivora chrysoptera</i>
Blue-winged warbler	<i>Vermivora cyanoptera</i>
Yellow-throated vireo	<i>Vireo flavifrons</i>
White-eyed vireo	<i>Vireo griseus</i>
Red-eyed vireo	<i>Vireo olivaceus</i>
Blue-headed vireo	<i>Vireo solitarius</i>
Mourning dove	<i>Zenaida macroura</i>
White-throated sparrow	<i>Zonotrichia albicollis</i>

CRUSTACEANS

Common Name	Scientific Name
Freshwater isopod	<i>Caecidotea sp</i>
Common blue crab	<i>Callinectes sapidus</i>
Freshwater amphipod	<i>Gammarus sp.</i>
Freshwater amphipod	<i>Hyalella azteca</i>
Isopod	<i>Isopoda</i>
Shrimp	<i>Palaemonetes sp.</i>
Crayfish	<i>Procambarus sp.</i>

FISH

Common Name	Scientific Name
Hickory shad	<i>Alosa mediocris</i>
White catfish	<i>Ameiurus catus</i>
Yellow catfish	<i>Ameiurus natalis</i>
Bowfin	<i>Amia calva</i>
American eel	<i>Anguilla rostrata</i>
Pirate perch	<i>Aphredoderus sayanus</i>
Common snook	<i>Centropomus undecimalis</i>
Chanchita*	<i>Cichlasoma dimerus</i>
Black pacu*	<i>Colossoma nigripinnis</i>
Grass carp*	<i>Ctenopharyngodon idella</i>
Koi*	<i>Cyprinus carpio carpio</i>

Gizzard shad	<i>Dorosoma cepedianum</i>
Threadfin shad	<i>Dorosoma petenense</i>
Ladyfish	<i>Elops saurus</i>
Bluespotted sunfish	<i>Enneacanthus gloriosus</i>
Lake chubsucker	<i>Erimyzon sucetta</i>
Chain pickerel	<i>Esox niger</i>
Golden topminnow	<i>Fundulus chrysotus</i>
Seminole killifish	<i>Fundulus seminolis</i>
Mosquitofish	<i>Gambusia holbrooki</i>
Naked goby	<i>Gobiosoma bosc</i>
Least killifish	<i>Heterandria formosa</i>
Brown hoplo*	<i>Hoplosternum littorale</i>
Blue catfish	<i>Ictalurus furcatus</i>
Channel catfish	<i>Ictalurus punctatus</i>
Flagfish	<i>Jordanella floridae</i>
Spotted gar	<i>Lepisosteus oculatus</i>
Longnose gar	<i>Lepisosteus osseus</i>
Florida gar	<i>Lepisosteus platyrhincus</i>
Redbreast sunfish	<i>Lepomis auritus</i>
Warmouth	<i>Lepomis gulosus</i>
Bluegill sunfish	<i>Lepomis macrochirus</i>
Redear sunfish	<i>Lepomis microlophis</i>
Spotted sunfish	<i>Lepomis punctatus</i>
Bluefin killifish	<i>Lucania goodei</i>
Rainwater killifish	<i>Lucania parva</i>
Tarpon	<i>Megalops atlanticus</i>
Inland silverside	<i>Menidia beryllina</i>
Atlantic croaker	<i>Micropogonias undulatus</i>
Largemouth bass	<i>Micropterus salmoides</i>
Striped bass	<i>Morone saxatilis</i>
Striped mullet	<i>Mugil cephalus</i>
Golden shiner	<i>Notemigonus crysoleucas</i>
Coastal shiner	<i>Notropis petersoni</i>
Ironcolor shiner	<i>Notropsis chaslybaeus</i>
Coastal shiner	<i>Notropsis petersoni</i>
Blue tilapia *	<i>Oreochromis aureus</i>
Blackbanded darter	<i>Percina nigrofasciata</i>
Pirapatinga*	<i>Piaractus brachypomus</i>
Sailfin molly	<i>Poecilia latipinna</i>
Black crappie	<i>Pomoxis nigromaculatus</i>
Sailfin suckermouth catfish*	<i>Pterygoplichthys disjunctivus</i>

Needlefish	<i>Strongylura spp.</i>
Hornet tilapia*	<i>Tilapia buttikoferi</i>
Hogchoker	<i>Trinectes maculatu</i>

GASTROPODS

Common Name	Scientific Name
Peninsula amnicola	<i>Amnicola dalli johnsoni</i>
True freshwater limpets	<i>Ancylidae</i>
Blue Spring hydrobe	<i>Aphaostracon asthenes SRST</i>
Blue Spring siltsnail	<i>Cincinnatia parva</i>
Tree snail	<i>Drymaeus sp.</i>
	<i>Elimia sp.</i>
Rosy predator snail	<i>Euglandina rosea</i>
Hyacinth siltsnail	<i>Floridobia floridana</i>
Pygmy siltsnail	<i>Floridobia parva SRST</i>
Florida leatherleaf slug	<i>Leidyula floridana</i>
Cockscomb hydrobe	<i>Littoridinops monroensis</i>
Redrim melania*	<i>Melanoides tuberculatus</i>
Fawn melania*	<i>Melanoides turriculus</i>
Sprite snail	<i>Micromenetus sp.</i>
	<i>Physa sp.</i>
Seminole ram's horn	<i>Planorbella duryi</i>
Serrate crownsnail	<i>Pyrgophorus platyrachis</i>
Siltsnail	<i>Spilochlamys sp.</i>
Quilted melania*	<i>Tarebia granifera</i>
Smooth-ribbed hydrobe	<i>Tryonia aequicostata</i>
Banded mystery snail	<i>Viviparus georgianus</i>

GYMNOSPERM

Common Name	Scientific Name
Red cedar	<i>Juniperus virginiana</i>
Sand pine	<i>Pinus clausa</i>
Slash pine	<i>Pinus elliotii</i>
Longleaf pine	<i>Pinus palustris</i>
Pond pine	<i>Pinus serotina</i>
Loblolly pine	<i>Pinus taeda</i>
Pond-cypress	<i>Taxodium ascendens</i>
Bald-cypress	<i>Taxodium distichum</i>

Coontie

Zamia pumila DV, FS, SC, HH

ANTS, BEES AND WASPS

Common Name	Scientific Name
Carpenter ant	<i>Camponotus socius</i>
Paper wasp	<i>Polistes annularis</i>
Southern yellowjacket	<i>Vespula squamosal</i>
Potter wasp	<i>Eumenes fraternus</i>
Velvet ant	<i>Dasymutilla occidentalis</i>

ARTHROPODA

Common Name	Scientific Name
Florida woods cockroach	<i>Eurycotis floridana</i>

BEETLES

Common Name	Scientific Name
Eastern eyed click beetle	<i>Alaus oculatus</i>
Metallic wood-boring beetle	<i>Chrysobothris femorata</i>
Water beetle	<i>Cybister sp.</i>
Water scavenger beetle	<i>Hydrophilidae</i>
Cylindrical hardwood borer	<i>Neoclytus acuminatus</i>
Horned passalus	<i>Odontotaenius disjunctus</i>
Crawling water beetle	<i>Peltodytes sp.</i>
Rainbow scarab	<i>Phanaeus igneus</i>
Firefly	<i>Photinus macdermotti</i>
Pyralis firefly	<i>Photinus pyralis</i>
Marsh beetle	<i>Prionocyphon sp.</i>
Giant root borer	<i>Prionus spp.</i>
Marsh beetle	<i>Scirtes sp.</i>
Riffle beetle	<i>Stenelmis sp.</i>
Flea beetle	<i>Altica sp.</i>
Pleasing fungus beetle	<i>Megalodacne sp.</i>

Blue tortoise beetle	<i>Hemisphaerota cyanea</i>
Net-winged beetle	<i>Calopteron sp.</i>
False mealworm beetle	<i>Alobates pennsylvanicus</i>
Shining leaf chafer	<i>Anomala marginata</i>
Aquatic burrowing beetle	<i>Suphisellus sp.</i>

BUTTERFLIES AND MOTHS

Common Name	Scientific Name
Gulf fritillary	<i>Agraulis vanillae</i>
Zebra swallowtail	<i>Eurytides marcellus</i>
Zebra longwing	<i>Heliconius charitonius</i>
Palamedes swallowtail	<i>Papilio palamedes</i>
Cloudless sulphur	<i>Phoebis sennae</i>
Long-tailed skipper	<i>Urbanus proteus</i>
Luna moth	<i>Actias luna</i>
White-lined leafroller	<i>Amorbia hummerosana</i>
Pink striped oak moth	<i>Anisota virginiensis</i>
Southern pine looper	<i>Caripeta aretaria</i>
Regal moth	<i>Citheronia regalis</i>
Contracted datana	<i>Datana contracta</i>
Tussock moth	<i>Dasychira spp.</i>
Somber carpet	<i>Disclisioprocta stellata</i>
Imperial moth	<i>Eacles imperialis</i>
	<i>Eupithecia miserulata</i>
Inchworm	<i>Geometridae</i>
Texas gray moth	<i>Glenoides texaniaria</i>
	<i>Heterocampa astarte</i>
Giant leopard moth	<i>Hypercompe scribonia</i>
Fall webworm	<i>Hyphantria cunea</i>
Southern flannel moth	<i>Megalopyge opercularis</i>
Eastern panthea	<i>Panthea furcilla</i>
	<i>Semiothisa punctolineata</i>
	<i>Semiothisa sandfordi</i>
Larch looper	<i>Semiothisa spp.</i>
	<i>Stenotrachelus approximaria</i>
Small tolype	<i>Tolype notialis</i>

Bella moth	<i>Utetheisa ornatrix</i>
Gray-banded zale	<i>Zale squamularis</i>

DRAGONFLIES AND DAMSELFLIES

Common Name	Scientific Name
Common green darner	<i>Anax junius</i>
Four spotted pennant	<i>Brachymesia gravida</i>
Damselfly	<i>Coenagrionidae</i>
Regal Darner	<i>Coryphaeschna ingens</i>
Great blue skimmer	<i>Libellula vibrans</i>
Royal River Cruiser	<i>Macromia taeniolata</i>
Cyrano Darner	<i>Nasiaeschna pentacantha</i>
Blue Dasher	<i>Pachydiplax longipennis</i>
Amberwing	<i>Perithemis tenera</i>
Little Blue Dragonlet	<i>Erythrodiplax minuscula</i>
Eastern Pondhawk	<i>Erythemis simplicicollis</i>
Golden-winged Skimmer	<i>Libellula auripennis</i>
Carolina saddlebags	<i>Tramea carolina</i>
Bluet	<i>Enallagma sp.</i>
Great Blue Skimmer	<i>Libellula vibrans</i>

FLIES

Common Name	Scientific Name
Robber fly	<i>Asilidae</i>
Aquatic fly	<i>Atrichopogon sp.</i>
Biting midge	<i>Ceratopogonidae</i>
Non-biting midge	<i>Chironomus sp.</i>
Non-biting midge	<i>Cladotanytarsus sp. f epler</i>
Non-biting midge	<i>Clinotanypus sp.</i>
Non-biting midge	<i>Cryptochironomus sp.</i>
Botfly species	<i>Cuterebra sp.</i>
Biting midge	<i>Dasyhelea sp.</i>
Non-biting midge	<i>Dicrotendipes modestus</i>
Non-biting midge	<i>Dicrotendipes simpsoni</i>
Non-biting midge	<i>Dicrotendipes sp. a epler</i>
Shore fly	<i>Ephydriidae</i>
Non-biting midge	<i>Glyptotendipes sp.</i>
Aquatic midge	<i>Goeldichironomus holoprasinus</i>

Aquatic midge	<i>Goeldichironomus natans</i>
Soldier fly	<i>Hedriodiscus sp.</i>
Crane fly	<i>Limonia sp.</i>
True crane fly	<i>Megistocera sp.</i>
Antlion	<i>Myrmeleon sp.</i>
Moth fly	<i>Pericoma sp.</i>
Non-biting midge	<i>Polypedilum illinoense grp.</i>
Non-biting midge	<i>Procladius sp.</i>
Non-biting midge	<i>Pseudosmittia sp.</i>
Midge	<i>Rheocricotopus robacki</i>
Non-biting midge	<i>Rheotanytarsus exiguus grp.</i>
Non-biting midge	<i>Tanytarsus sp. e epler</i>
Non-biting midge	<i>Tanytarsus sp. f epler</i>
Non-biting midge	<i>Tanytarsus sp. g epler</i>
Non-biting midge	<i>Tanytarsus sp. l epler</i>
Non-biting midge	<i>Tribelos fuscicornis</i>
Mayfly	<i>Caenis sp.</i>
Spongefly	<i>Sisyridae</i>

GRASSHOPPERS AND CRICKETS

Common Name	Scientific Name
Southern Yellow-winged Grasshopper	<i>Arphia granulata</i>
Shield-backed katydid	<i>Atlantiscus sp.</i>
Southern Greenstriped Grasshopper	<i>Chortophaga viridifasciata</i>
Eastern Lubber Grasshopper	<i>Romalea guttata</i>
Lubber grasshopper	<i>Romalea microptera</i>
American grasshopper	<i>Schistocerca americana</i>
Ridgeback Sand Grasshopper	<i>Spharagemon cristatum</i>
Melanoplus adelogyrus	St. John's Shortwing Grasshopper
Handsome Grasshopper	<i>Syrbula admirabilis</i>

MILLIPEDES

Common Name	Scientific Name
Florida ivory millipede	<i>Chicobolus spinigerus</i>
North American millipede	<i>Narceus americanus</i>

SPIDERS

Common Name	Scientific Name
Yellow garden orbweaver	<i>Argiope aurantia</i>
Banded garden orbweaver	<i>Argiope trifasciata</i>
Six spotted fishing spider	<i>Dolomedes triton</i>
Tropical orbweaver	<i>Eriophora ravilla</i>
Blacktailed red sheetweaver	<i>Florinda coccinea</i>
Bowl and Doily Spider	<i>Frontinella pyramitela</i>
Spiny backed orbweaver	<i>Gasteracantha cancriformis</i>
Hentz jumper	<i>Hentzia spp.</i>
Southern crevice spider	<i>Kukulcania hibernalis</i>
Brown widow	<i>Latrodectus geometricus</i>
Southern black widow	<i>Latrodectus mactans</i>
Orchard orbweaver	<i>Luecauge venusta</i>
Magnolia Green Jumping Spider	<i>Lyssomanes viridis</i>
Basilica	<i>Mecynogea lemniscata</i>
Arrowshaped orbweaver	<i>Micrathena sagittata</i>
Crab spider	<i>Misumessus spp.</i>
Hentz's orbweaver	<i>Neoscona crucifera</i>
Red femured orbweaver	<i>Neoscona domiciliorum</i>
Golden silk orbweaver	<i>Nephila clavipes</i>
Filmy dome spider	<i>Neriene radiata</i>
Green lynx	<i>Peucetia viridans</i>
Regal jumping spider	<i>Phidippus regius</i>
Spotted wolf spider	<i>Rabidosa punctulata</i>
Feather legged orbweaver	<i>Uloborus glomosus</i>

STICK INSECTS

Common Name	Scientific Name
Two-striped walkingstick	<i>Anisomorpha buprestoides</i>

TICKS AND MITES

Common Name	Scientific Name
Lone star tick	<i>Amblyomma americanum</i>
Water mite	<i>Arrenurus sp.</i>
Brown dog tick	<i>Rhipicephalus sanguineus</i>
Subterranean termite	<i>Reticulitermes (?) sp.</i>

TRUE BUGS, CICADAS, HOPPERS ECT.

Common Name	Scientific Name
Wheel Bug	<i>Arilus cristatus</i>
Leaf footed bug	<i>Acanthocephala sp.</i>
Waterscorpion	<i>Ranatra buenoi</i>

MAMMALS

Common Name	Scientific Name
Nine-banded armadillo	<i>Dasypus novemcinctus</i>
Virginia opossum	<i>Didelphis virginiana</i>
Big brown bat	<i>Eptesicus fuscus</i>
Domestic cat	<i>Felis catus</i> *
Bobcat	<i>Felis rufus</i> / <i>Lynx rufus</i>
Southeastern pocket gopher	<i>Geomys pinetis</i>
Southern flying squirrel	<i>Glaucomys volans</i>
River otter	<i>Lutra canadensis</i>
Striped skunk	<i>Mephitis mephitis</i>
Round-tailed muskrat	<i>Neofiber alleni</i>
Eastern woodrat	<i>Neotoma floridana</i>
Golden mouse	<i>Ochrotomys nuttalli</i>
White-tailed deer	<i>Odocoileus virginianus</i>
Marsh rice rat	<i>Oryzomys palustris</i>
Cotton mouse	<i>Peromyscus gossypinus</i> <i>gossypinus</i>
Eastern pipistrelle	<i>Pipistrellus subflavus</i>
Florida mouse	<i>Podomys floridanus</i>
Raccoon	<i>Procyon lotor</i>
Black rat	<i>Rattus rattus</i> *
Eastern mole	<i>Scalopus aquaticus</i>
Eastern gray squirrel	<i>Sciurus carolinensis</i>
Hispid cotton rat	<i>Sigmodon hispidus</i>
Wild pig	<i>Sus scrofa</i> *
Eastern cottontail	<i>Sylvilagus floridanus</i>
Marsh rabbit	<i>Sylvilagus palustris</i>
Florida manatee	<i>Trichechus manatus</i> SRST, BST
Gray fox	<i>Urocyon cinereoargenteus</i>
Florida black bear	<i>Ursus americanus floridanus</i>
Red fox	<i>Vulpes vulpes</i>

PTERIDOPHYTES

Common Name	Scientific Name
Ebony spleenwort	<i>Asplenium platyneuron</i>
American waterfern	<i>Azolla filiculoides</i>
Swamp fern	<i>Blechnum serrulatum</i>
Tuberous sword fern	<i>Nephrolepis cordifolia*</i>
Wild Boston fern	<i>Nephrolepis exaltata</i>
Cinnamon fern	<i>Osmunda cinnamomea</i> FS, HH
Royal fern	<i>Osmunda regalis var. spectabilis</i> FS, HH
Golden polypody	<i>Phlebodium aureum</i>
Resurrection fern	<i>Pleopeltis polypodioides</i>
Tailed bracken	<i>Pteridium aquilinum subsp. pseudocaudatum</i>
Water spangles	<i>Salvinia minima*</i>
Southern shield fern	<i>Thelypteris kunthii</i>
Marsh fern	<i>Thelypteris palustris var. pubescens</i>
Shoestring fern	<i>Vittaria lineata</i>
Netted chain fern	<i>Woodwardia areolata</i>
Virginia chain fern	<i>Woodwardia virginica</i>

REPTILES

Common Name	Scientific Name
Florida cottonmouth	<i>Agkistrodon piscivorus conanti</i>
American alligator	<i>Alligator mississippiensis</i> SRST, BST
Green anole	<i>Anolis carolinensis</i>
Brown anole	<i>Anolis sagrei*</i>
Florida softshell turtle	<i>Apalone ferox</i>
Eastern Six-lined Racerunner	<i>Aspidozelis sexlineata</i>
Florida scarlet snake	<i>Cemophora coccinea coccinea</i>
Florida snapping turtle	<i>Chelydra serpentina osceola</i>
Six-lined racerunner	<i>Cnemidophorus sexlineatus sexlineatus</i>
Southern black racer	<i>Coluber constrictor priapus</i>
Eastern diamondback	<i>Crotalus adamanteus</i>
Eastern chicken turtle	<i>Deirochelys reticularia reticularia</i>
Southern ringneck snake	<i>Diadophis punctatus punctatus</i>
Eastern indigo snake	<i>Drymarchon corais couperi</i> SC
Corn snake	<i>Elaphe guttata guttata</i>
Yellow rat snake	<i>Elaphe obsoleta quadrivittata</i>
Five-lined skink	<i>Eumeces fasciatus</i>
Southeastern five-lined skink	<i>Eumeces inexpectatus</i>

Broad-headed skink	<i>Eumeces laticeps</i>
Gopher tortoise	<i>Gopherus polyphemus</i> CS, DV, MF, SCF
Eastern hognose snake	<i>Heterodon platyrhinos</i>
Striped mud turtle	<i>Kinosternon bauri</i>
Florida mud turtle	<i>Kinosternon subrubrum steindachneri</i>
Scarlet kingsnake	<i>Lampropeltis triangulum elapsoides</i>
Eastern coachwhip	<i>Masticophis flagellum flagellum</i>
Eastern coral snake	<i>Micrurus fulvius fulvius</i>
Mississippi green water snake	<i>Nerodia cyclopion</i> HH, AF
Banded water snake	<i>Nerodia fasciata fasciata</i>
Florida water snake	<i>Nerodia fasciata pictiventris</i>
Florida green water snake	<i>Nerodia floridana</i>
Brown water snake	<i>Nerodia taxispilota</i>
Rough green snake	<i>Opheodrys aestivus</i>
Eastern slender glass lizard	<i>Ophisaurus attenuatus longicaudus</i>
Eastern glass lizard	<i>Ophisaurus ventralis</i>
Florida pine snake	<i>Pituophis melanoleucus mugitus</i> SC
Florida cooter	<i>Pseudemys floridana floridana</i>
Peninsula cooter	<i>Pseudemys floridana peninsularis</i>
Florida red-bellied turtle	<i>Pseudemys nelson</i>
Pine woods snake	<i>Rhadinaea flavilata</i>
Southern fence lizard	<i>Sceloporus undulatus undulatus</i>
Ground skink	<i>Scincella lateralis</i>
North Florida swamp snake	<i>Seminatrix pygaea pygaea</i>
Dusky pigmy rattlesnake	<i>Sistrurus miliarius barbouri</i>
Loggerhead musk turtle	<i>Sternotherus minor minor</i>
Common musk turtle	<i>Sternotherus odoratus</i>
Central Florida crowned snake	<i>Tantilla relicta neilli</i>
Florida box turtle	<i>Terrapene carolina bauri</i>
Peninsula Ribbonsnake	<i>Thamnophis sauritus</i>
Eastern garter snake	<i>Thamnophis sirtalis sirtalis</i>
Red-eared slider	<i>Trachemys scripta elegans</i> *
Yellow-bellied slider	<i>Trachemys scripta scripta</i> *

RIBBON WORMS

Common Name	Scientific Name
Freshwater ribbon worm	<i>Prostoma sp.</i>

SEGMENTED WORMS

Common Name	Scientific Name
Aquatic worm	<i>Bratislava unidentata</i>
Aquatic worm	<i>Dero digitata complex</i>
Aquatic worm	<i>Dero lodeni</i>
Aquatic worm	<i>Dero pectinata</i>
Leech	<i>Gloiobdella elongata</i>
Freshwater jawless leech	<i>Glossiphoniidae</i>
Aquatic worm	<i>Haber speciosus</i>
Leech	<i>Helobdella stagnalis</i>
Leech	<i>Helobdella triserialis</i>
Aquatic worm	<i>Limnodrilus hoffmeisteri</i>
Freshwater leech	<i>Macrobdella decora</i>
Aquatic worm	<i>Nais communis complex</i>
Aquatic worm	<i>Pristina leidyi</i>

SHARKS AND RAYS

Common Name	Scientific Name
Southern stingray	<i>Dasyatis americana</i>

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.

FNAI GLOBAL RANK DEFINITIONS

- G1 Critically imperiled globally because of extreme rarity (5 or fewer occurrences or less than 1000 individuals) or because of extreme vulnerability to extinction due to some natural or fabricated factor.
- G2 Imperiled globally because of rarity (6 to 20 occurrences or less than 3000 individuals) or because of vulnerability to extinction due to some natural or man-made factor.
- G3 Either very rare or local throughout its range (21-100 occurrences or less than 10,000 individuals) or found locally in a restricted range or vulnerable to extinction of other factors.
- G4 apparently secure globally (may be rare in parts of range)
- G5 demonstrably secure globally
- GH..... of historical occurrence throughout its range may be rediscovered (e.g., ivory-billed woodpecker)
- GX..... believed to be extinct throughout range
- GXC extirpated from the wild but still known from captivity or cultivation
- G#? Tentative rank (e.g., G2?)
- G#G# range of rank; insufficient data to assign specific global rank (e.g., G2G3)
- G#T# rank of a taxonomic subgroup such as a subspecies or variety; the G portion of the rank refers to the entire species and the T portion refers to the specific subgroup; numbers have same definition as above (e.g., G3T1)
- G#Q rank of questionable species - ranked as species but questionable whether it is species or subspecies; numbers have same definition as above (e.g., G2Q)

Imperiled Species Ranking Definitions

- 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.

Imperiled Species Ranking Definitions

LEGAL STATUS

FEDERAL

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

- LE..... Listed as Endangered Species in the List of Endangered and Threatened Wildlife and Plants under the provisions of the Endangered Species Act. Defined as any species that is in danger of extinction throughout all or a significant portion of its range.
- PE..... Proposed for addition to the List of Endangered and Threatened Wildlife and Plants as Endangered Species.
- LT..... Listed as Threatened Species. Defined as any species that is likely to become an endangered species within the near future throughout all or a significant portion of its range.
- PT..... Proposed for listing as Threatened Species.
- C Candidate Species for addition to the list of Endangered and Threatened Wildlife and Plants. Defined as those species for which the USFWS currently has on file sufficient information on biological vulnerability and threats to support proposing to list the species as endangered or threatened.
- E(S/A)..... Endangered due to similarity of appearance.
- T(S/A)..... Threatened due to similarity of appearance.
- EXPE, XE..... Experimental essential population. A species listed as experimental and essential.
- EXPN, XN.... Experimental non-essential population. A species listed as experimental and non-essential. Experimental, nonessential populations of endangered species are treated as threatened species on public land, for consultation purposes.

STATE

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

- FE..... Federally-designated Endangered
- FT..... Federally-designated Threatened
- FXN Federally-designated Threatened Nonessential Experimental Population
- FT(S/A) Federally-designated Threatened species due to similarity of appearance

Imperiled Species Ranking Definitions

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

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

- LE..... Listed as Endangered Plants in the Preservation of Native Flora of Florida Act. Defined as species of plants native to the state that are in imminent danger of extinction within the state, the survival of which is unlikely if the causes of a decline in the number of plants continue, and includes all species determined to be endangered or threatened pursuant to the Federal Endangered Species Act of 1973, as amended.
- LT..... Listed as Threatened Plants in the Preservation of Native Flora of Florida Act. Defined as species native to the state that are in rapid decline in the number of plants within the state, but which have not so decreased in such number as to cause them to be endangered.

Addendum 7—Cultural Information

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: <https://www.dos.myflorida.com/historical/preservation/compliance-and-review/regulations-guidelines/>

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

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

regarding individual projects must be submitted to the Division for review and recommendations.

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

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

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

E. Minimum Review Documentation Requirements

In order to have a proposed project reviewed by the Division, certain information must be submitted for comments and recommendations. The minimum review documentation requirements can be found at:

https://www.dos.myflorida.com/media/31392/minimum_review_documentation_requirements.pdf.

* * *

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

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) 245-6333
Email: CompliancePermits@DOS.MyFlorida.com

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 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
 - e)** 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.

Addendum 8 – Land Management Review

2018 Land Management Review Team Report for Hontoon Island State Park / Blue Springs State Park

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1. Introduction

Section 259.036, F.S. requires a periodic on-site review of conservation and recreation lands titled in the name of the Board of Trustees to determine (1) whether the lands are being managed for the purposes for which they were acquired and (2) whether they are being managed in accordance with their land management plan adopted pursuant to s. 259.032, F.S. In cases where the managed areas exceed 1,000 acres in size, such a review must be scheduled at least every five years. In conducting this review, a statutorily constructed review team “shall evaluate the extent to which the existing management plan provides sufficient protection to threatened or endangered species, unique or important natural or physical features, geological or hydrological functions or archaeological features. The review shall also evaluate the extent to which the land is being managed for the purposes for which it was acquired and the degree to which actual management practices, including public access, are in compliance with the adopted management plan.”

The land management review teams are coordinated by the Division of State Lands and consist of representatives from the Division of Recreation and Parks (DEP), the Florida Forest Service (DACS), the Fish and Wildlife Conservation Commission, the local government in which the property is located, the DEP District in which the parcel is located, the local soil and water conservation district or jurisdictional water management district, a conservation organization member, and a local private land manager.

Each Land Management Review Report is divided into three sections. Section 1 provides the details of the property being reviewed as well as the overall results of the report. Section 2 provides details of the Field Review, in which the Review Team inspects the results of management actions on the site. Section 3 provides details of the Land Management Plan Review, in which the team determines the extent to which the Management Plan provides for and documents adequate natural and recreational resource protection.

Finally, each report may also contain an Appendix that lists individual team member comments. This is a compilation of feedback, concerns or other thoughts raised by individual team members, but not necessarily indicative of the final consensus reached by the Land Management Review Team.

1.1. Property Reviewed in this Report

Name of Site: Hontoon Island State Park / Blue Springs State Park

Managed by: Department of Environmental Protection, Florida Park Service

Acres: 1,648 and 2,643 (4,292 total)

County: Lake and Volusia

Purpose(s) for Acquisition: to protect and restore the natural and cultural values of the property and provide the greatest benefit to the citizens of the state.

Acquisition Program(s): CARL/P2000/Florida Forever

Original Acquisition Date:

Area Reviewed: Entire Property

Last Management Plan Approval Date: 10/14/2005

Review Date: 10/26/18

Agency Manager and Key Staff Present:

- Michael Watkins, Park Manager, Blue Springs SP
- Rene Acuna, Park Manager, Hontoon Island SP

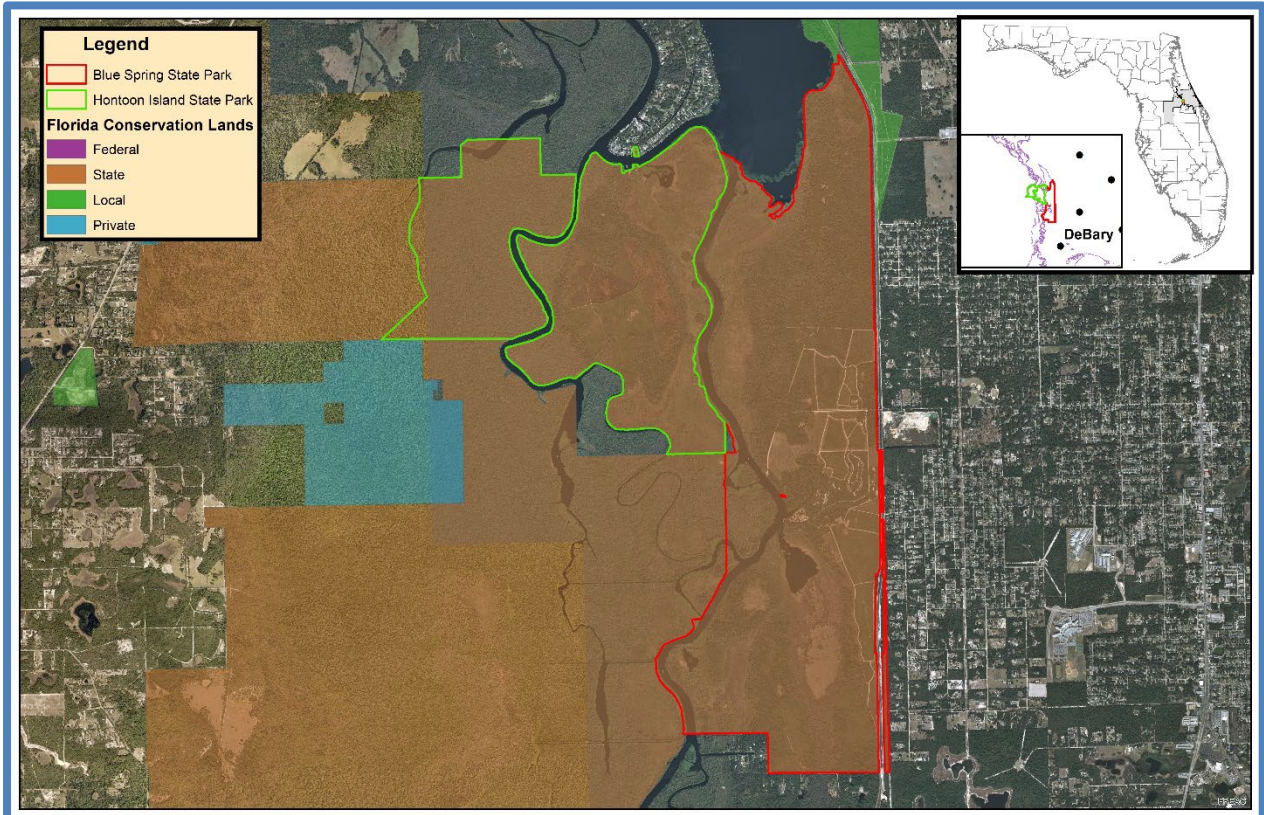
Review Team Members Present (voting)

- Jason DePue, DRP District
- Richard Harris, Local Gov't.
- Alex Kropp, FWC
- Brennan Hagan, DEP District
- Michael Edwards, FFS
- Brent Bachelder, SJRWMD
- Ray Jarrett, Cons. Organization
- Mike Brown, Private Land Manager

Other Non-Team Members Present (attending)

- Keith Singleton, DEP/DSL
- Andrew Lawrence, FWC/IPMS
- Barbara Howell, DEP/FCO

1.2 Property Map



1.3. Overview of Land Management Review Results

Is the property managed for purposes that are compatible with conservation, preservation, or recreation?

Yes = 8, No = 0

Are the management practices, including public access, in compliance with the management plan?

Yes = 8, No = 0

Table 1 shows the average scores received for each applicable category of review. *Field Review* scores refer to the adequacy of management actions in the field, while *Management Plan Review* scores refer to adequacy of discussion of these topics in the management plan. Scores range from 1 to 5 with 5 signifying excellence. For a more detailed key to the scores, please see *Appendix A*.

1.3.1 Consensus Commendations for the Managing Agency

The following commendations resulted from discussion and vote of the review team members:

1. The team commends the Florida Park Service (FPS) for continued management of scrub habitat at Blue Spring SP. The FPS has improved the habitat for the Florida scrub jays. (7+, 0-)
2. The team commends the FPS for the prescribed burn program at Blue Spring and Hontoon Island State Parks. Total acres burned, frequency and quality of burns is good. Staff have accomplished burning with unique obstacles of Hontoon Island. (7+, 0-)
3. The team commends the park staff for doing an excellent job with invasive plant management through the use of volunteers and proper treatment techniques. (7+, 0-)
4. The team commends the FPS for excellent mesic flatwoods habitat management. (7+, 0-)
5. The team commends the FPS for their excellent listed species monitoring program, especially with Florida scrub jay and manatees. (7+, 0-)

1.3.2. Consensus Recommendations to the Managing Agency

The following recommendations resulted from a discussion and vote of review team members. The next management plan update should include information about how these recommendations have been addressed:

1. The team recommends that the FPS update the timber assessment since it has been over 10 years from previous assessment and there is a need for timber management. (7+, 0-)

Managing Agency Response: *Agree. A new timber assessment will be included in the revised unit management plan.*

Table 1: Results at a glance.

Major Land Management Categories	Field Review	Management Plan Review
Natural Communities / Forest Management	3.96	3.15
Prescribed Fire / Habitat Restoration	4.48	3.11
Hydrology	3.95	3.02
Imperiled Species	4.44	3.35
Exotic / Invasive Species	3.83	3.07
Cultural Resources	3.50	3.31
Public Access / Education / Law Enforcement	4.10	3.38
Infrastructure / Equipment / Staffing	2.95	N/A

Color Code (See Appendix A for detail)

Excellent	Above Average	Below Average	Poor
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2. The team recommends that the FPS seek funding to aid in invasive plant management. (7+, 0-)

Managing Agency Response: FPS will continue to seek outside funding for invasive plant management to augment Park funding/efforts to further combat the spread of invasive plants.

3. The team recommends that the FPS continue spring vent and spring run erosion solutions. Make it a priority to see funding for bank stability. (7+, 0-)

Managing Agency Response: Agree. FPS initiated talks with FWC's Aquatic Habitat Conservation and Restoration (AHCR) Section to seek funding for the bank stabilization and the park has been awarded AHCR funds to start the restoration.

2. Field Review Details

2.1 Field Review Checklist Findings

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

1. **Natural communities, specifically mesic flatwoods, scrub, upland hardwood forest, baygall, depression marsh, floodplain swamp, hydric hammock, river floodplain lake, sandhill upland lake, blackwater stream, spring-run stream, aquatic cave, wet flatwoods, and sinkhole.**
2. **Listed species, plants and animals in general, and specifically scrub jay, manatee, silt snail and gopher tortoise.**
3. **Natural resource survey/monitoring resources, specifically listed species or their habitat monitoring, other non-game species or their habitat monitoring, and invasive species survey and monitoring.**
4. **Resource management (prescribed fire), specifically area being burned, frequency, and quality.**
5. **Restoration, specifically scrub restoration.**
6. **Non-native, invasive, and problem species, specifically prevention and control of plants, and control of animals.**
7. **Ground water and surface water monitoring, specifically quality and quantity.**
8. **Resource protection, specifically boundary survey.**
9. **Adjacent property concerns, land use, specifically expanding development, and well fields.**
10. **Public access, specifically roads and parking.**
11. **Environmental education and outreach, specifically wildlife, invasive species, habitat management activities, interpretive facilities and signs, recreational opportunities, and management of visitor impacts.**
12. **Management resources, specifically waste disposal.**

2.2. Items Requiring Improvement Actions in the Field

The following items received low scores on the review team checklist, which indicates that management actions noted during the Field Review were not considered sufficient (less than 3.0 score on average). Please note that overall good scores do not preclude specific recommendations by the review team requiring remediation. **The management plan update should include information on how these items have been addressed:**

1. *Management Resources, specifically staff and funding, received below average scores. The review team is asked to evaluate, based on information provided by the managing agency, whether management resources are sufficient.*

Managing Agency Response: If it is determined that additional staff and funding are needed at the time of the next unit management plan revision, it will be included in the plan. However, no new staff can be assigned to this or any other park unit unless they are appropriated by the Legislature or reassigned from other units.

2.3. Field Review Checklist and Scores

Field Review Item	Reference #	Anonymous Team Members								Average
		1	2	3	4	5	6	7	8	
Natural Communities (I.A)										
Mesic Flatwoods	I.A.1	4	5	4	5	5	5	5	5	4.75
Scrub	I.A.2	3	4	5	4	4	4	4	4	4.00
Shell Mound	I.A.3	2	4	3	4	1	4	5	4	3.38
Upland Hardwood Forest	I.A.4	4	5	4	5	4	5	4	5	4.50
Baygall	I.A.5	4	5	2	5	5	4	5	5	4.38
Depression Marsh	I.A.6	5	5	4	5	4	5	5	4	4.63
Floodplain Swamp	I.A.7	4	5	5	5	5	4	5	5	4.75
Floodplain Marsh	I.A.8	4	3	3	3	3	3	3	3	3.13
Hydric Hamock	I.A.9	4	5	4	5	4	5	5	5	4.63
River Floodplain Lake	I.A.11	4	5	4	4	4	5	5	4	4.38
Sandhill Upland Lake	I.A.12	4	4	5	x	x	4	5	3	4.17
Blackwater Stream	I.A.13	4	5	5	5	4	5	5	5	4.75
Spring-Run Stream	I.A.14	2	5	5	4	5	5	5	4	4.38
Aquatic Cave	I.A.15	3	5	5	5	5	5	5	4	4.63
Scrubby Flatwoods	I.A.16	4	4	4	x	1	5	3	3	3.43
Wet Flatwoods	I.A.17	4	5	5	5	3	4	5	5	4.50
Sinkhole	I.A.19	4	5	5	5	4	4	5	5	4.63
Natural Communities Average Score										4.29
Listed species:Protection & Preservation (I.B)										
Animals	I.B.1			5	5	4	4	5	5	4.67
Scrub Jay	I.B.1.a	5	5	5	5	4	5	5	5	4.88
Manatee	I.B.1.b	5	5	5	5	4	4	5	5	4.75
Silt Snail	I.B.1.c	4	4	5	4	4	3	5	3	4.00
Gopher Tortoise	I.B.1.d	4	4	5	5	4	3	5	5	4.38
Plants	I.B.2		3	5	4		4	5	3	4.00
Listed Species Average Score										4.44

Natural Resources Survey/Monitoring Resources (I.C)										
Listed species or their habitat monitoring	I.C.2	4	5	5	5	4	5	5	5	4.75
Other non-game species or their habitat monitoring	I.C.3	4	4	5	4	3	3	5	4	4.00
Fire effects monitoring	I.C.4	5		5	3	3	4	3	3	3.71
Other habitat management effects monitoring	I.C.5	4	4	5	x	3	3	2	4	3.57
Invasive species survey / monitoring	I.C.6	5	4	5	4	4	4	4	5	4.38
Cultural Resources (Archeological & Historic sites) (II.A, II.B)										
Cultural Res. Survey	II.A	4	3	5	3	3	4	2	4	3.50
Protection and preservation	II.B	3	4	5	3	3	2	4	4	3.50
Cultural Resources Average Score										3.50
Resource Management, Prescribed Fire (III.A)										
Area Being Burned (no. acres)	III.A1	5	4	5	4	4	4	4	4	4.25
Frequency	III.A.2	5	4	5	4	4	4	4	4	4.25
Quality	III.A.3	5	4	5	5	4	3	4	4	4.25
Resource Management, Prescribed Fire Average Score										4.25
Restoration (III.B)										
Scrub Restoration	III.B.2		5	5	5	4	5	5	4	4.71
Restoration Average Score										4.71
Forest Management (III.C)										
Timber Inventory	III.C.1	4	4	3	4	3	4	2	4	3.50
Timber Harvesting	III.C.2	4	4	3	4	3	4	4	4	3.75
Forest Management Average Score										3.63
Non-Native, Invasive & Problem Species (III.D)										
Prevention										
prevention - plants	III.D.1.a	4	5	5	4	1	5	4	4	4.00
prevention - animals	III.D.1.b	4	4	5	3	2	2	4	3	3.38
prevention - pests/pathogens	III.D.1.c	4	4	5	3	2	4	3	3	3.50
Control										
control - plants	III.D.2.a	4	5	5	5	3	5	4	4	4.38
control - animals	III.D.2.b	4		5	4	3	5	4	4	4.14
control - pest/pathogens	III.D.2.c	4		4	3	3	4	4	3	3.57
Non-Native, Invasive & Problem Species Average Score										3.83
Hydrologic/Geologic function Hydro-Alteration (III.E.1)										
Roads/culverts	III.E.1.a	4	4	4	4	2	4	3	4	3.63
Discharge Pipe (on Stark Tract)	III.E.1.f	4	4		3	x	3	5	3	3.67
Hydrologic/Geologic function, Hydro-Alteration Average Score										3.65
Ground Water Monitoring (III.E.2)										
Ground water quality	III.E.2.a	4	5	5	3	x	4	5	3	4.14
Ground water quantity	III.E.2.b	4	5	5	3	x	3	5	3	4.00
Ground Water Monitoring Average Score										4.07
Surface Water Monitoring (III.E.3)										
Surface water quality	III.E.3.a	4	5	5	3	x	4	5	3	4.14

Surface water quantity	III.F.3.b	4	5	5	3	x	4	5	3	4.14
Surface Water Monitoring Average Score										4.14
Resource Protection (III.F)										
Boundary survey	III.F.1	4	4	5	4	3	5	5	3	4.13
Gates & fencing	III.F.2	4	4	3	3	3	3	2	3	3.13
Signage	III.F.3	2	4	5	3	3	4	5	3	3.63
Law enforcement presence	III.F.4	3	5	5	3	3	4	5	3	3.88
Resource Protection Average Score										3.69
Adjacent Property Concerns (III.G)										
Land Use										
Expanding development	III.G.1.a	4	4	5	x	3	4	5	4	4.14
Sand Mine	III.G.1.b	4	4	5	5	3	4	5	4	4.25
Inholdings/additions	III.G.2	3	4	5	3	3	5	5	3	3.88
Public Access & Education (IV.1, IV.2, IV.3, IV.4, IV.5)										
Public Access										
Roads	IV.1.a	4	5	5	4	4	5	5	5	4.63
Parking	IV.1.b	4	5	5	4	4	4	5	4	4.38
Boat Access	IV.1.c	4	5	3	4	4	4	5	4	4.13
Environmental Education & Outreach										
Wildlife	IV.2.a	5	5	5	4	4	5	5	5	4.75
Invasive Species	IV.2.b	4	5	5	4	4	5	5	5	4.63
Habitat Management Activities	IV.2.c	4	5	5	4	4	3	5	4	4.25
Interpretive facilities and signs	IV.3	5	5	5	5	4	4	5	5	4.75
Recreational Opportunities	IV.4	5	5	5	5	4	5	5	5	4.88
Management of Visitor Impacts	IV.5	2	5	5	4	4	4	5	5	4.25
Public Access & Education Average Score										4.51
Management Resources (V.1, V.2, V.3, V.4)										
Maintenance										
Waste disposal	V.1.a	4	4	5	4	1	4	5	5	4.00
Sanitary facilities	V.1.b	4	4	4	4	1	3	5	5	3.75
Infrastructure										
Buildings	V.2.a	3	4	3	2	1	4	2	5	3.00
Equipment	V.2.b	3	4	4	3	1	4	2	5	3.25
Staff	V.3	2	2	1	2	x	2	1	2	1.71
Funding	V.4	1	2	3	2	x	2	2	2	2.00
Management Resources Average Score										2.95

Color Code:

Excellent	Above Average	Below Average	Poor
	Missing Vote	Insufficient Information	

See Appendix A for detail

3. Land Management Plan Review Details

3.1 Items Requiring Improvements in the Management Plan

The following items received low scores on the review team checklist, which indicates that the text noted in the Management Plan Review does not sufficiently address this issue (less than 3.0 score on average.). Please note that overall good scores do not preclude specific recommendations by the review team requiring remediation. The next management plan update should address the checklist items identified below:

1. *Natural Communities, specifically floodplain marsh, scrubby flatwoods, wet flatwoods, and sinkhole, received below average scores. This is an indication that the management plan does not sufficiently address current or desired condition and/or future management actions to protect or restore.*

Managing Agency Response: The current management plan was reviewed by the relevant agencies and was in full compliance with Chapters 253 and 259, F.S., and Chapter 18-2, F.A.C., when it was approved by ARC. A discussion of these communities will be more thoroughly addressed in the next plan update.

2. *Listed Species protection and preservation, specifically gopher tortoise, received a below average score. This is an indication that the management plan does not sufficiently address protection and preservation of listed species.*

Managing Agency Response: The current management plan was reviewed by the relevant agencies and was in full compliance with Chapters 253 and 259, F.S., and Chapter 18-2, F.A.C., when it was approved by ARC. The protection and preservation of gopher tortoise will be more thoroughly addressed in the next plan update.

3. *Natural Resources Survey and Monitoring Resources, specifically other habitat management effects monitoring, received a below average score. This is an indication that the management plan does not sufficiently address survey or monitoring.*

Managing Agency Response: The current management plan was reviewed by the relevant agencies and was in full compliance with Chapters 253 and 259, F.S., and Chapter 18-2, F.A.C., when it was approved by ARC. A discussion about habitat management and survey/monitoring will be more thoroughly addressed in the next plan update.

4. *Restoration, specifically scrub restoration, received a below average score. This is an indication that the management plan does not sufficiently address restoration.*

Managing Agency Response: The current management plan was reviewed by the relevant agencies and was in full compliance with Chapters 253 and 259, F.S., and Chapter 18-2, F.A.C., when it was approved by ARC. A discussion about scrub restoration and what has been accomplished in the past 10 years will be more thoroughly addressed in the next plan update.

5. *Non-native, Invasive & Problem Species, specifically prevention of animals, and pests/pathogens, received below average scores. This is an indication that the management plan does not sufficiently address prevention of invasive species.*

Managing Agency Response: Agree. The current plan is old and a new version of the plan is in process which will include a discussion about the prevention of animals, pests, and pathogens.

- Hydrologic/Geologic function, Hydro-Alteration, specifically discharge pipe (on Stark Tract), received a below average score. This is an indication that the management plan does not sufficiently address hydrologic and geologic function.*

Managing Agency Response: The current management plan was reviewed by the relevant agencies and was in full compliance with Chapters 253 and 259, F.S., and Chapter 18-2, F.A.C., when it was approved by ARC. A discussion about about the discharge pipe will be more thoroughly addressed in the next plan update.

- Adjacent Property Concerns, specifically discussion of potential surplus land determination, received below average scores. This is an indication that the management plan does not sufficiently address adjacent property.*

Managing Agency Response: The current management plan was reviewed by the relevant agencies and was in full compliance with Chapters 253 and 259, F.S., and Chapter 18-2, F.A.C., when it was approved by ARC. A discussion about surplus lands will be more thoroughly addressed in the next plan update.

3.2 Management Plan Review Checklist and Scores

Plan Review Item	Reference #	Anonymous Team Members								Average
		1	2	3	4	5	6	7	8	
Natural Communities (I.A)										
Mesic Flatwoods	I.A.1	5	5	4	3	2	4	3	3	3.63
Scrub	I.A.2	5	5	5	3	4	4	3	3	4.00
Shell Mound	I.A.3	3	4	3	3	3	4	3	3	3.25
Upland Hardwood Forest	I.A.4	4	4	4	3	3	5	2	3	3.50
Baygall	I.A.5	4	4	4	3	2	3	3	3	3.25
Depression Marsh	I.A.6	5	4	5	3	3	4	3	3	3.75
Floodplain Swamp	I.A.7	4	4	4	3	2	3	3	3	3.25
Floodplain Marsh	I.A.8	4	4	2	3	3	2	3	2	2.88
Hydric Hamock	I.A.9	4	4	4	3	2	3	3	3	3.25
River Floodplain Lake	I.A.11	4	4	4	3	2	4	3	2	3.25
Sandhill Upland Lake	I.A.12	4	4	5	3	1	3	3	3	3.25
Blackwater Stream	I.A.13	4	4	4	3	2	5	3	3	3.50
Spring-Run Stream	I.A.14	3	4	4	3	2	5	3	3	3.38
Aquatic Cave	I.A.15	4	4	5	3	2	4	2	3	3.38
Scrubby Flatwoods	I.A.16	4	4	3	2	1	3	2	1	2.50
Wet Flatwoods	I.A.17	5	2	1	2	1	2	1	1	1.88
Sinkhole	I.A.19	4	3	4	1	1	1	1	1	2.00
Natural Communities Average Score										3.17

Listed species: Protection & Preservation (I.B)										
Animals	I.B.1			5	2	3	4	3	3	3.33
Scrub Jay	I.B.1.a	5	4	4	3	3	5	3	3	3.75
Manatee	I.B.1.b	4	4	5	3	3	5	4	3	3.88
Silt Snail	I.B.1.c	4	4	3	2	3	3	3	2	3.00
Gopher Tortoise	I.B.1.d	4	4	4	1	3	1	3	1	2.63
Plants	I.B.2		4	4	3		4	3	3	3.50
Listed Species Average Score										3.35
Natural Resources Survey/Monitoring Resources (I.C)										
Listed species or their habitat monitoring	I.C.2	4	4	4	3	3	5	3	3	3.63
Other non-game species or their habitat monitoring	I.C.3	4		4	2	3	3	3	3	3.14
Fire effects monitoring	I.C.4	5	4	3	2	3	3	2	2	3.00
Other habitat management effects monitoring	I.C.5	4	4	3	3	3	2	2	2	2.88
Invasive species survey / monitoring	I.C.6	5	4	4	3	3	3	3	3	3.50
Cultural Resources (Archeological & Historic sites) (II.A,II.B)										
Cultural Res. Survey	II.A	4	4	3	3	3	4	3	3	3.38
Protection and preservation	II.B	4	4	2	3	3	3	4	3	3.25
Cultural Resources Average Score										3.31
Resource Management, Prescribed Fire (III.A)										
Area Being Burned (no. acres)	III.A.1	5	4	4	3	3	5	2	3	3.63
Frequency	III.A.2	5	4	4	3	3	4	2	3	3.50
Quality	III.A.3	5	4	5	3	3	2	2	3	3.38
Resource Management, Prescribed Fire Average Score										3.50
Restoration (III.B)										
Scrub Restoration	III.B.2		4	4	3	2	2	2	2	2.71
Restoration Average Score										2.71
Forest Management (III.C)										
Timber Inventory	III.C.1	4	4	3	3	1	3	3	3	3.00
Timber Harvesting	III.C.2	4	4	3	3	2	4	3	3	3.25
Forest Management Average Score										3.13
Non-Native, Invasive & Problem Species (III.D)										
Prevention										
prevention - plants	III.E.1.a	4	4	4	3	1	4	2	3	3.13
prevention - animals	III.E.1.b	4	4	4	3	1	2	2	2	2.75
prevention - pests/pathogens	III.E.1.c	4	4	3	3	1	4	2	2	2.88
Control										
control - plants	III.E.2.a	4	4	4	3	3	4	2	3	3.38
control - animals	III.E.2.b	4		4	3	3	4	2	3	3.29
control - pest/pathogens	III.E.2.c	4		3	3	3	3	2	3	3.00
Non-Native, Invasive & Problem Species Average Score										3.07
Hydrologic/Geologic function, Hydro-Alteration (III.E.1)										

Roads/culverts	III.F.1.a	4	4	3	3	2	4	3	3	3.25
Discharge Pipe (on Stark Tract)	III.F.1.f	4	4		1	1	2	1	1	2.00
Hydrologic/Geologic function, Hydro-Alteration Average Score										2.63
Ground Water Monitoring (III.E.2)										
Ground water quality	III.F.2.a	4	4	4	3	1	4	3	3	3.25
Ground water quantity	III.F.2.b	4	4	5	3	1	3	3	3	3.25
Ground Water Monitoring Average Score										3.25
Surface Water Monitoring (III.E.3)										
Surface water quality	III.F.3.a	4	4	4	3	1	4	2	3	3.13
Surface water quantity	III.F.3.b	4	4	4	3	1	4	3	3	3.25
Surface Water Monitoring Average Score										3.19
Resource Protection (III.F)										
Boundary survey	III.G.1	4	4	5	3	1	5	3	3	3.50
Gates & fencing	III.G.2	4	4	3	3	1	3	3	3	3.00
Signage	III.G.3	4	4	4	3	1	3	3	3	3.13
Law enforcement presence	III.G.4	4	4	5	3	1	4	3	3	3.38
Resource Protection Average Score										3.25
Adjacent Property Concerns (III.G)										
Land Use										
Expanding development	III.H.1.a	4	4	4		2	4	3	3	3.43
Sand Mine	III.H.1.b	4	4	5	3	2	4	3	3	3.50
Inholdings/additions	III.H.2	3	4	5	4	1	5	2	3	3.38
Discussion of Potential Surplus Land Determination	III.H.3	3	2	1	1	1	1	2	1	1.50
Surplus Lands Identified?	III.H.4	4	4	5	4	1	4	2	4	3.50
Public Access & Education (IV.1, IV.2, IV.3, IV.4, IV.5)										
Public Access										
Roads	IV.1.a	4	4	5	3	2	4	2	3	3.38
Parking	IV.1.b	4		4	3	2	4	3	3	3.29
Boat Access	IV.1.c	4		3	3	2	4	3	3	3.14
Environmental Education & Outreach										
Wildlife	IV.2.a	5	4	5	3	2	5	3	3	3.75
Invasive Species	IV.2.b	4	4	5	3	2	5	3	3	3.63
Habitat Management Activities	IV.2.c	4	4	4	3	2	3	3	3	3.25
Interpretive facilities and signs	IV.3	5	5	5	3	2	4	3	3	3.75
Recreational Opportunities	IV.4	5	5	5	3	2	5	3	3	3.88
Management of Visitor Impacts	IV.5	4	4	5	3	2	4	3	3	3.50
Public Access & Education Average Score										3.51
Managed Area Uses (VI.A, VI.B)										
Existing Uses										
Camping	VI.A.1	5	5	5	5	3	5	4	5	4.63
Cabins	VI.A.2	5	5	5	5	3	3	4	5	4.38
Fishing	VI.A.3	5	5	4	5	4	3	4	5	4.38

Picnicking	VI.A.4	5	5	5	5	4	3	5	5	4.63
Hiking	VI.A.5	5	5	5	5	4	4	4	5	4.63
Canoeing	VI.A.6	4	5	5	5	4	4	5	5	4.63
Shared Use Trails	VI.A.7	4	5	5	5	4	4	4	5	4.50
Nature Study	VI.A.8	5	5	5	5	4	3	5	5	4.63
Swimming/SCUBA Diving	VI.A.9	4	5	5	5	4	5	5	5	4.75
Proposed Uses										
Observation Pier	VI.B.1	4	5	5	5	0	5	5	5	4.25

Color Code:

Excellent	Above Average	Below Average	Poor	See Appendix A for detail
	Missing Vote	Insufficient Information		

Appendix A: Scoring System Detail

Explanation of Consensus Commendations:

Often, the exceptional condition of some of the property's attributes impress review team members. In those instances, team members are encouraged to offer positive feedback to the managing agency in the form of a commendation. The teams develop commendations generally by standard consensus processes or by majority vote if they cannot obtain a true consensus.

Explanation of Consensus Recommendations:

Subsection 259.036(2), F.S., specifically states that the managing entity shall consider the findings and recommendations of the land management review. We ask team members to provide general recommendations for improving the management or public access and use of the property. The teams discuss these recommendations and develop consensus recommendations as described above. We provide these recommendations to the managing agency to consider when finalizing the required ten-year management plan update. We encourage the manager to respond directly to these recommendations and include their responses in the final report when received in a timely manner.

Explanation of Field Review Checklist and Scores, and Management Plan Review Checklist and Scores:

We provide team members with a checklist to fill out during the evaluation workshop phase of the Land Management Review. The checklist is the uniform tool used to evaluate both the management actions and condition of the managed area, and the sufficiency of the management plan elements. During the evaluation workshop, team members individually provide scores on each issue on the checklist, from their individual perspective. Team members also base their evaluations on information provided by the managing agency staff as well as other team member discussions. Staff averages these scores to evaluate the overall conditions on the ground, and how the management plan addresses the issues. Team members must score each management issue 1 to 5: 1 being the management practices are clearly insufficient, and 5 being that the management practices are excellent. Members may choose to abstain if they have inadequate expertise or information to make a cardinal numeric choice, as indicated by an "X" on the checklist scores, or they may not provide a vote for other unknown reasons, as indicated by a blank. If a majority of members failed to vote on any issue, that issue is determined to be irrelevant to management of that property or it was inadequately reviewed by the team to make an intelligent choice. In either case staff eliminated the issue from the report to the manager.

Average scores are interpreted as follows:

Scores 4.0 to 5.0 are *Excellent*

Scores 3.0 to 3.99 are *Above Average*

Scores 2.0 to 2.99 are *Below Average*

Scores 1.0 to 1.99 are considered *Poor*

Addendum 9—Timber Management Analysis

Florida State Parks Timber Management Analysis

Special Management Considerations

Timber Management Analysis

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

Blue Spring State Park (Blue Spring) is designated as a single-use park. As such, timber management is only permitted as a method of natural community restoration and maintenance rather than as an ongoing extractive activity. The feasibility of managing/harvesting timber at Blue Spring during the period covered by the UMP was considered pursuant to the DRP statutory responsibilities to analyze 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 natural characteristics to the degree practicable, except in those natural communities specifically managed for a structure that differs from that described in the timber assessment found at reference sites for those communities established by the Florida Natural Areas Inventory (FNAI). In the case of imperiled species, the management of certain natural communities may differ from standard treatments to provide optimum habitat conditions within the park.

Most natural communities evaluated at Blue Spring had overstory pine stocking levels within the range identified for corresponding FNAI Reference Sites. Conversely, non-pine (hardwood) overstory stocking levels were generally above the upper limits identified for corresponding FNAI Reference Sites. The Timber Management Analysis found in Addendum __8__ provides additional details. Overstory thinning is a management tool that may be utilized in areas which have overstocked conditions. However, the specific management goals and objectives for each natural community are detailed in the Resource Management Component. Activities related to stand improvement, including palmetto and midstory reduction, are ongoing in many areas, as well.

Florida State Parks Timber Management Analysis

Addendum _____ Timber Management Analysis

1. Management Context and Best Management Practices

Timber management at Blue Spring State Park (Blue Spring) is based on the desired future condition (DFC) of a management zone or natural community (NatCom) as determined by the DRP Unit Management Plans, along with guidelines developed by the Florida Natural Areas Inventory (FNAI). In most cases, the DFC will be closely related to the historic NatCom. However, it is important to note, that in areas where the historic community has been severely altered by past land use practices, the DFC may not always be the same as the historic NatCom. All timber management activities undertaken will adhere to or exceed the current Florida Silvicultural Best Management Practices (BMPs) and Florida Forestry Wildlife BMPs for State Imperiled Species. DRP shall take all measures necessary to protect water quality and wildlife species of concern while conducting timber management activities. DRP has contracted with a private sector, professional forest management firm to complete this timber assessment: F4 Tech.

2. Purpose of Timber Management Activities

Timber management activities may be conducted to help improve or maintain current conditions to achieve the associated DFC. Timber management will primarily be conducted in upland NatCom types. Candidate upland NatCom types may include mesic flatwoods, wet flatwoods, sandhill, upland pine, and upland mixed woodland along with scrubby flatwoods, scrub, and altered landcover types such as successional hardwood forest and pine plantations. There will likely be no scheduled timber management activities in historically hardwood-dominated or wetland NatCom types, e.g., upland hardwood forest, hydric hammock, and slope forest. In some circumstances, timber management may include the harvesting and removal of overstory invasive/exotic trees. Descriptions of community types are detailed in the in the Resource Management Component.

3. Potential Silvicultural Treatments

Several silvicultural treatments may be considered and utilized over the next ten years. The various types of timber harvests may include pine thinning, targeted hardwood overstory removal, and clearcutting. Silvicultural treatments will be selectively implemented to minimize potential impacts to water and soil resources, non-target vegetation, and wildlife (see BMPs). Depending upon the condition and marketability of the timber being manipulated, it is possible to generate revenue from the harvest. It is also possible the timber removal could be a cost to DRP. In all decisions, the mission of preserving and restoring natural communities will be the guiding factor.

Thinning is conducted to reduce the basal area (BA) or density of trees/stems in a stand to improve forest health and growth conditions for residual trees. Allowing trees more room to grow has the potential to increase tree and forest vigor, which helps mitigate the potential for damaging insect and disease outbreaks. Most tree harvesting/removals also increase sunlight reaching the forest floor and fine fuels that facilitate consistent fire return intervals and responses, which can benefit

Florida State Parks Timber Management Analysis

groundcover vegetation abundance, species richness, and overall ecological diversity. The disruption of natural fire regimes and fire return intervals can often result in the need to remove undesirable or overstocked hardwood stems that currently occupy growing space in the canopy and sub-canopy. Clearcutting may be used to support restoration goals by removing off-site pine or hardwood species and is a precursor to establishing site-appropriate species. It can also be used to control insect infestations that are damaging or threatening forest resources and ecosystem conditions.

On occasion, salvage cuts may need to be conducted to remove small volumes of wood damaged by fire, wind storm, insect or other natural causes. The decision whether or not to harvest the affected timber will depend on the threat to the surrounding stands, risk of collateral ecological damage, and the volume/value of the trees involved. For example, small, isolated lightning-strike and beetle kills are a natural part of a healthy ecosystem and normally would not be cut. However, if a drought caused the insect infestation to spread, the affected trees and buffer zone might have to be removed to prevent significant damage.

4. Inventory Data and Potential Actions per Area of Interest or Management Zone

Blue Spring comprises 2,659 acres in Volusia County. A total of 840 acres are associated with five (5) upland community types that are potential candidates for timber management. From September 2017 to January 2018, an inventory based on field plots was conducted across and within these areas to quantify overstory, midstory, and understory conditions. Various park-level and NatCom-level summary statistics can be found in the following tables.

This timber assessment was based on management zone and NatCom boundary GIS data provided by DRP in April 2019. It is not intended to be prescriptive. Stakeholders and DRP staff are encouraged to view this timber assessment and inventory data as supplemental information for future consideration. Given the dynamic nature of property ownership and land management activities at Blue Spring, together with the timeframe required to create or update a UMP, it is possible that some tabular data may be dated. Therefore, NatCom acreages and recent treatments that occurred after the April 2019 period may not be reflected in the following tables.

Table 1. General summary statistics for Blue Spring State Park

Number of Management Zones within the Park	33
Upland NatCom acres	1,257

Mesic Flatwoods (139.8 acres)

Longleaf pine (*Pinus palustris*) is the preferred overstory pine species in the region. The FNAI reference site in this region for mesic flatwoods contains longleaf pine at a

Florida State Parks Timber Management Analysis

basal area (BA) of 10 to 50 square feet per acre with non-pine at a density of 0 trees per acre (TPA). The following table shows the overstory condition for this natural community at Blue Spring and target overstory condition for mesic flatwoods in this region.

MZ ID	Mesic Flatwoods (Acres)	Current Average Overstory Conditions							Target Overstory Conditions	
		Pine BA (ft ² /ac)	Pine TPA	Pine Volume (tons/ac)	Non-Pine BA (ft ² /ac)	Non-Pine TPA	Non-Pine Volume (tons/ac)	Total Pine and Non-Pine Volume (tons/ac)	FNAI Reference Condition Pine BA Range (ft ² /ac)	FNAI Reference Condition Non-Pine TPA Range
BSP-01	70.6	26.3	46.0	19.3	8.4	12.0	3.3	22.6	10 - 50	0 - 0
BSP-04	27.5	10.0	7.2	7.7	0.0	0.0	0.0	7.7	10 - 50	0 - 0
BSP-05	27.8	15.0	17.0	11.2	57.5	141.5	0.0	11.2	10 - 50	0 - 0
BSP-14	2.8	0.0	0.0	0.0	140.0	515.5	0.0	0.0	10 - 50	0 - 0
BSP-15C	11.1	25.0	26.9	18.0	10.0	42.1	4.0	22.0	10 - 50	0 - 0
Total	139.8									

Scrub (396.1 acres)

Sand pine (*Pinus clausa*) is the preferred overstory pine species in the region. The FNAI reference site in this region for scrub contains sand pine at a basal area (BA) of 0 to 20 square feet per acre with non-pine at a density of 0 to 26 trees per acre (TPA). The following table shows the overstory condition for this natural community at Blue Spring and target overstory condition for scrub in this region.

MZ ID	Scrub (Acres)	Current Average Overstory Conditions							Target Overstory Conditions	
		Pine BA (ft ² /ac)	Pine TPA	Pine Volume (tons/ac)	Non-Pine BA (ft ² /ac)	Non-Pine TPA	Non-Pine Volume (tons/ac)	Total Pine and Non-Pine Volume (tons/ac)	FNAI Reference Condition Pine BA Range (ft ² /ac)	FNAI Reference Condition Non-Pine TPA Range
BSP-02	19.8	0.0	0.0	0.0	3.1	7.0	0.0	0.0	0 - 20	0 - 26
BSP-03	37.9	--	--	--	--	--	--	--	--	--
BSP-05	9.3	--	--	--	--	--	--	--	--	--
BSP-06A	25.7	--	--	--	--	--	--	--	--	--
BSP-06B	45.9	--	--	--	--	--	--	--	--	--
BSP-07A	33.5	1.1	8.6	0.2	1.1	13.8	0.0	0.2	0 - 20	0 - 26
BSP-07B	19.1	2.5	9.6	0.9	0.0	0.0	0.0	0.9	0 - 20	0 - 26
BSP-08	15.3	12.5	47.0	4.7	30.0	104.4	0.0	4.7	0 - 20	0 - 26
BSP-09	10.2	0.0	0.0	0.0	40.0	274.4	0.0	0.0	0 - 20	0 - 26
BSP-10	4.8	--	--	--	--	--	--	--	--	--
BSP-13	8.3	--	--	--	--	--	--	--	--	--
BSP-14	11.6	--	--	--	--	--	--	--	--	--

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Timber Management Analysis**

MZ ID	Scrub (Acres)	Current Average Overstory Conditions							Target Overstory Conditions	
		Pine BA (ft2/ac)	Pine TPA	Pine Volume (tons/ac)	Non-Pine BA (ft2/ac)	Non-Pine TPA	Non-Pine Volume (tons/ac)	Total Pine and Non-Pine Volume (tons/ac)	FNAI Reference Condition Pine BA Range (ft2/ac)	FNAI Reference Condition Non-Pine TPA Range
BSP-15A	16.9	--	--	--	--	--	--	--	--	--
BSP-15B	34.9	13.3	122.5	0.0	0.0	0.0	0.0	0.0	0 - 20	0 - 26
BSP-15C	5.2	--	--	--	--	--	--	--	--	--
BSP-16	10.1	0.0	0.0	0.0	70.0	143.9	34.2	34.2	0 - 20	0 - 26
BSP-17	24.2	0.0	0.0	0.0	60.0	135.4	31.0	31.0	0 - 20	0 - 26
BSP-21	28.0	0.0	0.0	0.0	8.3	38.2	0.0	0.0	0 - 20	0 - 26
BSP-22	22.5	--	--	--	--	--	--	--	--	--
BSP-23	0.3	--	--	--	--	--	--	--	--	--
BSP-24	2.0	--	--	--	--	--	--	--	--	--
BSP-30	5.4	0.0	0.0	0.0	20.0	77.2	0.0	0.0	0 - 20	0 - 26
BSP-32	5.3	--	--	--	--	--	--	--	--	--
Total	396.2									

Scrubby Flatwoods (189.3 acres)

Longleaf pine (*Pinus palustris*) is the preferred overstory pine species in the region. The FNAI reference site in this region for scrubby flatwoods contains longleaf pine at a basal area (BA) of 10 to 60 square feet per acre with non-pine at a density of 0 to 26 trees per acre (TPA). The following table shows the overstory condition for this natural community at Blue Spring and target overstory condition for scrubby flatwoods in this region.

MZ ID	Scrubby Flatwoods (Acres)	Current Average Overstory Conditions							Target Overstory Conditions	
		Pine BA (ft2/ac)	Pine TPA	Pine Volume (tons/ac)	Non-Pine BA (ft2/ac)	Non-Pine TPA	Non-Pine Volume (tons/ac)	Total Pine and Non-Pine Volume (tons/ac)	FNAI Reference Condition Pine BA Range (ft2/ac)	FNAI Reference Condition Non-Pine TPA Range
BSP-01	9.4	--	--	--	--	--	--	--	--	--
BSP-02	3.0	0.0	0.0	0.0	50.0	144.6	25.2	25.2	10 - 60	0 - 26
BSP-14	45.0	1.7	1.4	1.0	33.3	159.3	0.0	1.0	10 - 60	0 - 26
BSP-15C	12.0	4.0	34.2	0.0	2.0	1.7	0.0	0.0	10 - 60	0 - 26
BSP-16	8.3	0.0	0.0	0.0	45.0	196.6	2.5	2.5	10 - 60	0 - 26
BSP-17	36.0	0.0	0.0	0.0	73.3	168.9	29.1	29.1	10 - 60	0 - 26
BSP-19	37.5	0.0	0.0	0.0	38.3	81.1	9.2	9.2	10 - 60	0 - 26
BSP-20	6.2	10.0	5.8	7.2	10.0	62.9	0.0	7.2	10 - 60	0 - 26
BSP-21	1.4	--	--	--	--	--	--	--	--	--
BSP-24	30.5	3.3	1.7	2.8	76.7	221.6	6.8	9.6	10 - 60	0 - 26

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MZ ID	Scrubby Flatwoods (Acres)	Current Average Overstory Conditions							Target Overstory Conditions	
		Pine BA (ft ² /ac)	Pine TPA	Pine Volume (tons/ac)	Non-Pine BA (ft ² /ac)	Non-Pine TPA	Non-Pine Volume (tons/ac)	Total Pine and Non-Pine Volume (tons/ac)	FNAI Reference Condition Pine BA Range (ft ² /ac)	FNAI Reference Condition Non-Pine TPA Range
Total	189.3									

Successional Hardwood Forest (58.5 Acres)

This altered landcover type is generally characterized by a closed-canopied forest dominated by fast growing hardwoods such as laurel oak (*Quercus laurifolia*), water oak (*Q. nigra*), sweetgum (*Liquidambar styraciflua*), and remnant pines (*Pinus* spp.). These forests generally develop as a result of altered fire regimes associated with several NatCom types, e.g., mesic flatwoods, sandhill, upland pine, upland mixed woodland, or old-field succession. Restoration actions may include overstory thinning, mowing, reintroduction of fire, site preparation, and planting of longleaf pine (*Pinus palustris*) and/or perennial grasses such as wiregrass (*Aristida stricta*). The following table shows the overstory condition for this community type at Blue Spring.

MZ ID	Successional Hardwood Forest (Acres)	Current Average Overstory Conditions							Target Overstory Conditions	
		Pine BA (ft ² /ac)	Pine TPA	Pine Volume (tons/ac)	Non-Pine BA (ft ² /ac)	Non-Pine TPA	Non-Pine Volume (tons/ac)	Total Pine and Non-Pine Volume (tons/ac)	FNAI Reference Condition Pine BA Range (ft ² /ac)	FNAI Reference Condition Non-Pine TPA Range
BSP-16	2.3	--	--	--	--	--	--	--	--	--
BSP-17	0.2	--	--	--	--	--	--	--	--	--
BSP-18	54.9	0.0	0.0	0.0	82.5	82.9	34.8	34.8	-	-
BSP-19	1.1	--	--	--	--	--	--	--	--	--
Total	58.5									

Wet Flatwoods (56.1 Acres)

Slash pine (*Pinus elliottii*) and pond pine (*Pinus serotina*) are the preferred overstory pine species in the region. The FNAI reference site in this region for wet flatwoods contains slash and pond pine at a basal area (BA) of 10 to 50 square feet per acre with non-pine at a density of 0 trees per acre (TPA). The following table shows the overstory condition for this natural community at Blue Spring and target overstory condition for wet flatwoods in this region.

**Florida State Parks
Timber Management Analysis**

MZ ID	Wet Flatwoods (Acres)	Current Average Overstory Conditions							Target Overstory Conditions	
		Pine BA (ft ² /ac)	Pine TPA	Pine Volume (tons/ac)	Non-Pine BA (ft ² /ac)	Non-Pine TPA	Non-Pine Volume (tons/ac)	Total Pine and Non-Pine Volume (tons/ac)	FNAI Reference Condition Pine BA Range (ft ² /ac)	FNAI Reference Condition Non-Pine TPA Range
BSP-02	56.1	27.1	23.3	19.9	17.1	27.4	8.0	27.9	10 - 50	0 - 0
Total	56.1									

Addendum 10—Local Government Comprehensive Plan Compliance

Local Government Comprehensive Plan Compliance

From: [Degagne, Demi](#)
To: planning@volusia.org; cmcfadane@volusia.org
Cc: tfoelker@volusia.org; [Armaghani, Yasmine](#); [Alsentzer, Daniel](#); [Eugate, Brian](#)
Subject: Request for County Review RE Comprehensive Plan Compliance - Blue Spring and Hontoon Island State Parks Unit Management Plans
Date: Thursday, June 9, 2022 11:34:19 AM
Attachments: [image001.png](#)

Good Morning,

The Florida Department of Environmental Protection, Division of Recreation and Parks, Office of Park Planning is responsible for the unit management planning of all Florida State Parks. As part of this planning process, prior to the unit management plan being presented to its Acquisition and Restoration Council for consideration, the Office of Park Planning is now required to connect and communicate with the area's agency that is responsible for the local comprehensive plan to determine if the park unit management plan is in compliance with the comprehensive plan. Specifically, we want to make sure we are accurately citing the future land use and zoning designations for the park and would like to confirm that our proposed developments in the conceptual land use section comply with those designations. The existing facilities section will also need to be reviewed.

We would like to have the Blue Spring State Park and Hontoon Island State Park draft unit management plans reviewed for compliance. The documents can be found at the following links: <https://floridadep.gov/parks/parks-office-park-planning/documents/blue-spring-state-park-2022-ag-draft-unit-management-plan>
<https://floridadep.gov/parks/parks-office-park-planning/documents/hontoon-island-state-park-2022-ag-draft-unit-management>

Please acknowledge receipt and provide an approximate turn-around time for the review. If this request should be redirected to another person or section, please let us know. In the meantime, if you need any clarification regarding this request, the draft document or its contents, please contact Yasmine Armaghani at Yasmine.Armaghani@floridadep.gov or by phone at 850-245-3066. Ms. Armaghani, who has been copied with this communication, is the Planner assigned to handle this park's management planning and will be able to answer any questions regarding the plan.

Thank you for your time, help and direction.

Have a good rest of the day!



Demi P. Degagne

Florida Department of Environmental Protection
Division of Recreation and Parks/Office of Park Planning
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Local Government Comprehensive Plan Compliance
