



# TIMBER ASSESSMENTS

## **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.

Big Shoals State Park 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 Big Shoals 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 Big Shoals had pine overstory stocking levels within the range identified for corresponding FNAI Reference Sites. Conversely, most natural communities evaluated at the park had hardwood overstory stocking levels above the range 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.

## **Timber Management Analysis**

### **1. *Management Context and Best Management Practices***

Timber management at Big Shoals State Park 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 NatComs. 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 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 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, 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***

Big Shoals comprises a total of 1,680 acres in Hamilton County. A total of 1,044 acres are associated with four (4) upland natural community (NatCom) types that are potential candidates for timber management. In April and May 2016, 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 December 2017. 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 Big Shoals, 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 December 2017 period may not be reflected in the following tables.



## Florida State Parks Timber Management Analysis

### Sandhill (35 acres)

Longleaf pine (*Pinus palustris*) is the preferred overstory pine species in the region. The FNAI reference site in this region for sandhill contains longleaf pine at a basal area (BA) of 20 to 60 square feet per acre with non-pine species at between 0 and 79 trees per acre (TPA). The following table shows the overstory condition for this natural community at Big Shoals and target overstory condition for sandhill in this region.

MZ ID	Sandhill (Acres)	Current Average Overstory Conditions							Target Overstory Conditions	
		Pine BA (ft <sup>2</sup> /ac)	Pine TPA	Pine Volume (tons/ac)	Non-Pine BA (ft <sup>2</sup> /ac)	Non-Pine TPA	Non-Pine Volume (tons/ac)	Total Pine and Non-Pine Volume (tons/ac)	FNAI Reference Condition Pine BA Range (ft <sup>2</sup> /ac)	FNAI Reference Condition Non-Pine TPA Range
BSH-1A*	5.6	--	--	--	--	--	--	--	--	--
BSH-1D	20.3	12.5	12.7	11.1	10.0	6.8	4.8	15.9	20 - 60	0 - 79
BSH-2Dn*	4.0	--	--	--	--	--	--	--	--	--
BSH-2En	3.2	20.0	14.6	18.2	70.0	190.3	16.3	34.5	20 - 60	0 - 79
BSH-2L	1.9	10.0	7.7	8.9	30.0	41.8	0.0	8.9	20 - 60	0 - 79
<b>Total</b>	<b>35.0</b>									

### Upland Mixed Woodland (211.2 acres)

Longleaf pine (*Pinus palustris*), southern red oak (*Quercus falcata*), mockernut hickory (*Carya tomentosa*), and sand post oak (*Q. margaretta*) are the preferred overstory pine species in the region. The FNAI reference site in this region for sandhill contains longleaf pine at a basal area (BA) of 10 to 30 square feet per acre with non-pine species at between 0 and 263 trees per acre (TPA). The following table shows the overstory condition for this natural community at Big Shoals and target overstory condition for sandhill in this region.

MZ ID	Upland Mixed Woodland (Acres)	Current Average Overstory Conditions							Target Overstory Conditions	
		Pine BA (ft <sup>2</sup> /ac)	Pine TPA	Pine Volume (tons/ac)	Non-Pine BA (ft <sup>2</sup> /ac)	Non-Pine TPA	Non-Pine Volume (tons/ac)	Total Pine and Non-Pine Volume (tons/ac)	FNAI Reference Condition Pine BA Range (ft <sup>2</sup> /ac)	FNAI Reference Condition Non-Pine TPA Range
BSH-1A*	1.8	--	--	--	--	--	--	--	--	--
BSH-1D	14.2	5.0	3.7	4.7	125.0	361.4	60.7	65.3	10 - 30	0 - 263
BSH-2A	57.5	51.1	35.3	50.6	93.3	223.8	74.8	125.3	10 - 30	0 - 263



# Florida State Parks Timber Management Analysis

## Special Management Considerations

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Big Talbot Island State Park (Big Talbot) 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 Big Talbot 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 Big Talbot had overstory pine stocking levels generally below 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 Big Talbot State Park (Big Talbot) is based on the desired future condition (DFC) of a management zone or natural community (NatCom) as determined by the DRP Unit Management Plans (UMP), along with guidelines developed by the 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 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 NatComs 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 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.

## Florida State Parks Timber Management Analysis

On occasion, salvage cuts may need to be conducted to remove small volumes of wood damaged by fire, windstorm, 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-strikes 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**

Big Talbot comprises 1,680 acres in Duval County. A total of 507 acres are associated with two (2) upland NatCom types that are potential candidates for timber management. In February 2016, 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 Big Talbot, 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 Big Talbot Island State Park**

Number of Management Zones within the Park	26
Upland NatCom acres	507

#### **Scrubby Flatwoods (424.6 acres)**

Slash pine (*Pinus elliottii*) and longleaf pine (*Pinus palustris*) are the preferred overstory pine species in the region. The FNAI reference site in this region for scrubby flatwoods contains slash and longleaf pine at a basal area (BA) of 20 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 Big Talbot and target overstory condition for scrubby flatwoods in this region.

## Florida State Parks Timber Management Analysis

MZ ID	Scrubby Flatwoods (Acres)	Current Average Overstory Conditions							Target Overstory Conditions	
		Pine BA (ft <sup>2</sup> /ac)	Pine TPA	Pine Volume (tons/ac)	Non-Pine BA (ft <sup>2</sup> /ac)	Non-Pine TPA	Non-Pine Volume (tons/ac)	Total Pine and Non-Pine Volume (tons/ac)	FNAI Reference Condition Pine BA Range (ft <sup>2</sup> /ac)	FNAI Reference Condition Non-Pine TPA Range
BT-01An	1.7	--	--	--	--	--	--	--	--	--
BT-01As	12.6	0.0	0.0	0.0	35.0	262.8	0.0	0.0	20 - 60	0 - 26
BT-02A	8.9	6.7	6.8	4.8	16.7	141.2	0.0	4.8	20 - 60	0 - 26
BT-02B	170.6	0.0	0.0	0.0	17.5	128.3	0.5	0.5	20 - 60	0 - 26
BT-03	98.7	0.0	0.0	0.0	47.5	270.3	2.9	2.9	20 - 60	0 - 26
BT-04A	86.6	0.0	0.0	0.0	37.8	143.6	0.0	0.0	20 - 60	0 - 26
BT-05	45.5	0.0	0.0	0.0	61.4	104.2	4.7	4.7	20 - 60	0 - 26
<b>Total</b>	<b>424.6</b>									

### Wet Flatwoods (82.4 acres)

Slash pine (*Pinus elliottii*) is the preferred overstory pine species in the region. The FNAI reference site in this region for wet flatwoods contains slash 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 Big Talbot and target overstory condition for wet flatwoods in this region.

MZ ID	Wet Flatwoods (Acres)	Current Average Overstory Conditions							Target Overstory Conditions	
		Pine BA (ft <sup>2</sup> /ac)	Pine TPA	Pine Volume (tons/ac)	Non-Pine BA (ft <sup>2</sup> /ac)	Non-Pine TPA	Non-Pine Volume (tons/ac)	Total Pine and Non-Pine Volume (tons/ac)	FNAI Reference Condition Pine BA Range (ft <sup>2</sup> /ac)	FNAI Reference Condition Non-Pine TPA Range
BT-01An	12.8	22.5	18.6	19.3	75.0	135.2	0.0	19.3	10 - 50	0 - 0
BT-01As	23.9	82.5	111.8	60.8	20.0	85.3	0.0	60.8	10 - 50	0 - 0
BT-01Bn	5.7	--	--	--	--	--	--	--	--	--
BT-02A	1.2	0.0	0.0	0.0	20.0	136.0	0.0	0.0	10 - 50	0 - 0
BT-02B	1.3	--	--	--	--	--	--	--	--	--
BT-03	4.1	--	--	--	--	--	--	--	--	--
BT-04A	14.6	23.3	17.0	14.3	33.3	118.7	7.2	21.5	10 - 50	0 - 0
BT-05	2.9	10.0	3.0	11.5	60.0	104.6	0.0	11.5	10 - 50	0 - 0
BT-10A	14.9	5.0	1.9	4.8	75.0	205.8	8.9	13.7	10 - 50	0 - 0
BT-10B	1.1	--	--	--	--	--	--	--	--	--
<b>Total</b>	<b>82.4</b>									

## **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.

Cedar Key Scrub State Reserve (Cedar Key Scrub) 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 Cedar Key Scrub 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 Cedar Key Scrub had pine and non-pine (hardwood) overstory stocking levels within or above the range 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.

**Addendum \_\_\_\_\_ Timber  
Management Analysis**

**1. Management Context and Best Management Practices**

Timber management at Cedar Key Scrub State Reserve (Cedar Key Scrub) 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 NatComs. Candidate upland NatCom types may include sandhill, scrubby flatwoods, mesic flatwoods and scrub. There will likely be no scheduled timber management activities in historically hardwood-dominated or wetland natural communities. In some circumstances, timber management may include the harvesting and removal of overstory invasive/exotic trees. Descriptions of community types are detailed 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.

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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, 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***

Cedar Key Scrub comprises a total of 6,774 acres in Levy County. A total of 2,390 acres are associated with four (4) upland NatCom types that are potential candidates for timber management. From March to June 2016, an inventory based on field plots was conducted across and within a large percentage of these areas to quantify overstory, midstory and understory conditions. A second inventory was conducted in the recently-acquired Panther Tract from February to March 2019. 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 September 2018. 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 Cedar Key Scrub, 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 September 2018 period may not be reflected in the following tables.

## Florida State Parks Timber Management Analysis

**Table 1. General summary statistics for Cedar Key Scrub State Reserve**

Number of Management Zones within the State Reserve	43
Upland NatCom acres	2,390

### Mesic Flatwoods (1,213.8 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 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 Cedar Key Scrub 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 <sup>2</sup> /ac)	Pine TPA	Pine Volume (tons/ac)	Non-Pine BA (ft <sup>2</sup> /ac)	Non-Pine TPA	Non-Pine Volume (tons/ac)	Total Pine and Non-Pine Volume (tons/ac)	FNAI Reference Condition Pine BA Range (ft <sup>2</sup> /ac)	FNAI Reference Condition Non-Pine TPA Range
CK-1A	22.2	23.3	9.5	18.0	20.0	50.8	13.6	31.6	10 - 50	0 - 0
CK-1B	22.1	42.5	39.0	32.7	8.8	23.3	5.4	38.1	10 - 50	0 - 0
CK-1C	3.4	40.0	35.0	28.5	20.0	18.1	0.0	28.5	10 - 50	0 - 0
CK-1D	15.1	24.0	32.1	18.7	38.0	154.8	16.9	35.6	10 - 50	0 - 0
CK-2A	6.3	--	--	--	--	--	--	--	--	--
CK-2B	75.4	42.0	44.7	31.3	2.0	15.8	0.0	31.3	10 - 50	0 - 0
CK-2C	2.1	--	--	--	--	--	--	--	--	--
CK-2D	44.8	43.3	62.0	30.6	1.7	13.3	0.0	30.6	10 - 50	0 - 0
CK-2E	8.6	--	--	--	--	--	--	--	--	--
CK-2F	73.8	25.5	29.2	19.2	15.5	28.5	1.0	20.2	10 - 50	0 - 0
CK-2G	10.9	17.5	23.8	9.3	17.5	106.8	0.0	9.3	10 - 50	0 - 0
CK-2H	42.8	43.8	44.5	31.6	15.0	24.8	3.0	34.7	10 - 50	0 - 0
CK-2J	89.2	28.8	20.8	26.1	18.8	48.3	0.7	26.8	10 - 50	0 - 0
CK-2K	46.4	71.4	117.6	56.9	0.0	0.0	0.0	56.9	10 - 50	0 - 0
CK-2L	31.0	40.0	75.5	28.3	0.0	0.0	0.0	28.3	10 - 50	0 - 0
CK-2M	38.6	23.3	63.4	16.4	1.7	10.9	0.0	16.4	10 - 50	0 - 0
CK-2N	11.3	100.0	152.2	69.2	0.0	0.0	0.0	69.2	10 - 50	0 - 0
CK-2Qn	37.0	--	--	--	--	--	--	--	--	--
CK-2Qs	15.6	30.0	25.2	22.8	0.0	0.0	0.0	22.8	10 - 50	0 - 0
CK-3	59.0	84.4	181.8	62.6	5.6	14.4	2.6	65.2	10 - 50	0 - 0
CK-4A	36.4	15.0	8.8	12.5	1.7	1.0	0.0	12.5	10 - 50	0 - 0

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CK-4B	57.2	42.9	38.4	30.9	8.6	9.2	3.9	34.8	10 - 50	0 - 0
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## Florida State Parks Timber Management Analysis

MZ ID	Mesic 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
CK-5A	63.4	17.3	16.0	14.3	2.7	16.5	0.5	14.8	10 - 50	0 - 0
CK-5B	6.4	25.0	118.0	18.7	0.0	0.0	0.0	18.7	10 - 50	0 - 0
CK-5C	8.1	46.7	22.5	37.9	6.7	49.6	0.0	37.9	10 - 50	0 - 0
CK-5D	25.5	10.0	9.9	5.4	0.0	0.0	0.0	5.4	10 - 50	0 - 0
CK-6A	2.4	--	--	--	--	--	--	--	--	--
CK-6D	4.9	--	--	--	--	--	--	--	--	--
CK-6E	3.7	5.0	2.0	4.1	0.0	0.0	0.0	4.1	10 - 50	0 - 0
CK-7	0.9	--	--	--	--	--	--	--	--	--
CK-8A	3.3	--	--	--	--	--	--	--	--	--
CK-8Bn	18.6	100.0	344.2	57.5	0.0	0.0	0.0	57.5	10 - 50	0 - 0
CK-8Bs	13.9	165.0	692.0	88.8	0.0	0.0	0.0	88.8	10 - 50	0 - 0
CK-8Cs	62.6	105.0	355.6	60.0	0.0	0.0	0.0	60.0	10 - 50	0 - 0
CK-8D	3.1	--	--	--	--	--	--	--	--	--
CK-9A	85.6	8.0	13.4	5.5	2.7	6.6	1.3	6.7	10 - 50	0 - 0
CK-9B	37.4	40.0	120.9	25.8	1.4	10.5	0.0	25.8	10 - 50	0 - 0
CK-9C	74.5	30.0	68.9	20.3	1.3	7.9	0.0	20.3	10 - 50	0 - 0
CK-10	50.5	57.0	110.1	40.2	3.0	23.9	0.0	40.2	10 - 50	0 - 0
<b>Total</b>	<b>1,213.8</b>									

### Sandhill (4.3 acres)

Longleaf pine (*Pinus palustris*) is the preferred overstory pine species in the region. The FNAI reference site in this region for sandhill contains longleaf pine at a basal area (BA) of 20 to 60 square feet per acre with non-pine species between 0 and 79 trees per acre (TPA). There was no inventory data collected for this natural community at Cedar Key Scrub as of the writing of this assessment.

MZ ID	Sandhill (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
CK-1B	4.3	--	--	--	--	--	--	--	--	--
<b>Total</b>	<b>4.3</b>									

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**Scrub (240.8 acres)**

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Sand live oak (*Quercus geminata*), myrtle oak (*Q. myrtifolia*), Chapman's oak (*Q. chapmanii*), and sand pine (*Pinus clausa*) are common overstory species. Sand pine 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 species between 0 and 13 trees per acre (TPA). The following table shows the overstory condition for this natural community at Cedar Key Scrub and target overstory condition for scrub in this region.

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
CK-1B	9.9	--	--	--	--	--	--	--	--	--
CK-1C	15.8	36.0	90.3	16.7	6.0	10.5	4.1	20.8	0 - 20	0 - 13
CK-2K	0.3	--	--	--	--	--	--	--	--	--
CK-2L	4.2	--	--	--	--	--	--	--	--	--
CK-4B	8.6	26.7	65.6	12.0	6.7	57.0	0.0	12.0	0 - 20	0 - 13
CK-5A	13.5	--	--	--	--	--	--	--	--	--
CK-5C	3.2	--	--	--	--	--	--	--	--	--
CK-5D	7.7	10.0	1.4	0.0	0.0	0.0	0.0	0.0	0 - 20	0 - 13
CK-6A	11.1	15.0	50.3	6.3	0.0	0.0	0.0	6.3	0 - 20	0 - 13
CK-6B	9.6	35.0	128.7	13.9	0.0	0.0	0.0	13.9	0 - 20	0 - 13
CK-6C	15.2	--	--	--	--	--	--	--	--	--
CK-6E	19.7	13.3	22.6	6.2	0.0	0.0	0.0	6.2	0 - 20	0 - 13
CK-10	15.5	25.0	213.1	2.0	0.0	0.0	0.0	2.0	0 - 20	0 - 13
CK-11	106.4	9.5	81.9	0.0	17.9	76.4	2.2	2.2	0 - 20	0 - 13
<b>Total</b>	<b>240.8</b>									

### Scrubby Flatwoods (931.1 acres)

Longleaf (*Pinus palustris*) and slash pine (*Pinus elliottii*) are the preferred overstory pine species in the region. The FNAI reference site in this region for scrubby flatwoods contains longleaf and slash pine at a basal area (BA) of 10 to 60 square feet per acre with non-pine at a density between 0 and 26 trees per acre (TPA). At Cedar Key Scrub, scrubby flatwoods are managed to enhance habitat conditions for the federally threatened Florida scrub jay (*Aphelocoma coerulescens*). As such, overstory pine BA may not meet the target overstory conditions found at the FNAI reference site for scrubby flatwoods. The following table shows the overstory condition for this natural community at Cedar Key Scrub and target overstory condition for scrubby flatwoods in this region.

**Florida State Parks  
Timber Management Analysis**

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
CK-1B	13.2	--	--	--	--	--	--	--	--	--
CK-1C	5.2	10.0	70.0	4.1	0.0	0.0	0.0	4.1	10 - 60	0 - 26
CK-1D	3.6	0.0	0.0	0.0	10.0	58.5	0.0	0.0	10 - 60	0 - 26
CK-2A	20.0	--	--	--	--	--	--	--	--	--
CK-2B	67.1	15.7	21.6	9.5	7.1	48.3	0.0	9.5	10 - 60	0 - 26
CK-2C	10.1	10.0	19.3	4.4	0.0	0.0	0.0	4.4	10 - 60	0 - 26
CK-2D	16.8	26.0	35.2	19.1	0.0	0.0	0.0	19.1	10 - 60	0 - 26
CK-2E	10.3	2.5	2.0	1.3	0.0	0.0	0.0	1.3	10 - 60	0 - 26
CK-2F	8.1	--	--	--	--	--	--	--	--	--
CK-2G	1.5	--	--	--	--	--	--	--	--	--
CK-2H	4.2	0.0	0.0	0.0	40.0	216.1	0.0	0.0	10 - 60	0 - 26
CK-2J	5.8	30.0	19.6	28.6	0.0	0.0	0.0	28.6	10 - 60	0 - 26
CK-2K	12.6	--	--	--	--	--	--	--	--	--
CK-2L	46.9	30.0	34.6	19.4	0.0	0.0	0.0	19.4	10 - 60	0 - 26
CK-2M	64.1	7.8	11.6	5.6	0.0	0.0	0.0	5.6	10 - 60	0 - 26
CK-2N	4.6	--	--	--	--	--	--	--	--	--
CK-3	91.8	30.0	53.8	22.3	10.0	47.7	0.0	22.3	10 - 60	0 - 26
CK-4A	13.0	--	--	--	--	--	--	--	--	--
CK-4B	63.0	7.7	16.9	4.8	1.5	7.6	0.0	4.8	10 - 60	0 - 26
CK-5A	117.8	2.9	3.7	1.8	2.9	27.2	0.0	1.8	10 - 60	0 - 26
CK-5B	9.7	--	--	--	--	--	--	--	--	--
CK-5C	12.8	20.0	7.7	18.5	0.0	0.0	0.0	18.5	10 - 60	0 - 26
CK-5D	64.9	16.2	41.6	9.5	0.0	0.0	0.0	9.5	10 - 60	0 - 26
CK-6A	2.6	--	--	--	--	--	--	--	--	--
CK-6B	5.1	10.0	57.0	4.0	0.0	0.0	0.0	4.0	10 - 60	0 - 26
CK-6C	17.5	15.0	50.3	7.1	0.0	0.0	0.0	7.1	10 - 60	0 - 26
CK-6D	9.3	10.0	5.4	7.1	0.0	0.0	0.0	7.1	10 - 60	0 - 26
CK-6E	13.3	--	--	--	--	--	--	--	--	--
CK-8A	54.2	--	--	--	--	--	--	--	--	--
CK-8Bn	24.9	80.0	260.6	49.5	0.0	0.0	0.0	49.5	10 - 60	0 - 26
CK-8Bs	18.7	71.7	382.7	39.6	0.0	0.0	0.0	39.6	10 - 60	0 - 26
CK-8Cn	46.0	--	--	--	--	--	--	--	--	--
CK-8Cs	28.4	74.3	255.7	46.9	0.0	0.0	0.0	46.9	10 - 60	0 - 26
CK-8D	2.7	110.0	477.2	68.0	0.0	0.0	0.0	68.0	10 - 60	0 - 26

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CK-9B*	18.0	--	--	--	--	--	--	--	--	--
CK-10	10.7	16.7	125.1	0.0	0.0	0.0	0.0	0.0	10 - 60	0 - 26

**Florida State Parks  
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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
CK-11	12.6	15.0	181.1	0.0	0.0	0.0	0.0	0.0	10 - 60	0 - 26
<b>Total</b>	<b>931.1</b>									

## **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.

Crystal River Preserve State Park (Crystal River) 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 Crystal River during the period covered by the Unit Management Plan (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 reference site descriptions 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 Crystal River had overstory pine stocking levels generally within the ranges 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.

**Addendum \_\_\_\_\_**  
**Timber Management Analysis**

**1. Management Context and Best Management Practices**

Timber management at Crystal River Preserve State Park (Crystal River) is based on the desired future condition (DFC) of a management zone or natural community (NatCom) as determined by the DRP Unit Management Plan (UMP), 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 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 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 fires, windstorms, insects, 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-strikes 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 a buffer zone might have to be removed to prevent significant damage.

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

Crystal River comprises 27,653 acres in Citrus County. A total of 2,343 acres are associated with six (6) upland NatCom types that are potential candidates for timber management. From April to June 2016, an inventory based on field plots was conducted across and within these areas to quantify overstory, midstory and understory conditions. Tree data captured in the 2016 inventory was grown-to-current (circa 2022) for this timber assessment using an industry-standard growth and yield model developed and maintained by the U.S. Forest Service (Forest Vegetation Simulator). 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 June 2022. 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 Crystal River, 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 June 2022 period may not be reflected in the following tables.

**Table 1. General summary statistics for Crystal River.**

Number of Management Zones within the Park	97
Upland NatCom acres	8,744

**Mesic Flatwoods (1,414.2 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 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 Crystal River 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 <sup>2</sup> /ac)	Pine TPA	Pine Volume (tons/ac)	Non-Pine BA (ft <sup>2</sup> /ac)	Non-Pine TPA	Non-Pine Volume (tons/ac)	Total Pine and Non-Pine Volume (tons/ac)	FNAI Reference Condition Pine BA Range (ft <sup>2</sup> /ac)	FNAI Reference Condition Non-Pine TPA Range
CR-C01C	3.0	--	--	--	--	--	--	--	--	--
CR-C01D	0.7	--	--	--	--	--	--	--	--	--
CR-C03	20.0	0.0	0.0	0.0	64.5	208.4	35.4	35.4	10 - 50	0 - 0
CR-C03A	15.3	0.0	0.0	0.0	123.7	339.1	51.6	51.6	10 - 50	0 - 0
CR-C03B	8.3	89.1	200.6	62.2	0.0	0.0	0.0	62.2	10 - 50	0 - 0
CR-C03D	6.3	41.8	38.6	28.6	26.2	160.5	3.5	32.1	10 - 50	0 - 0
CR-C03F	2.0	21.3	8.5	22.6	10.0	5.0	0.0	22.6	10 - 50	0 - 0
CR-C03J	10.3	13.2	9.7	8.5	13.4	30.6	5.9	14.5	10 - 50	0 - 0
CR-C05A	28.9	33.2	54.9	23.2	2.5	5.3	1.8	25.0	10 - 50	0 - 0
CR-C05B	29.9	--	--	--	--	--	--	--	--	--
CR-C05D	25.5	21.3	40.9	15.6	32.8	84.8	6.9	22.5	10 - 50	0 - 0
CR-C05F	75.4	0.0	0.0	0.0	28.1	73.7	0.0	0.0	10 - 50	0 - 0
CR-C05G	4.4	41.5	27.5	32.8	0.0	0.0	0.0	32.8	10 - 50	0 - 0
CR-C05H	1.5	--	--	--	--	--	--	--	--	--
CR-C05K	26.2	--	--	--	--	--	--	--	--	--
CR-C07A	17.9	25.0	11.8	25.4	34.7	46.8	24.8	50.2	10 - 50	0 - 0
CR-C07F	6.2	7.0	5.2	7.4	50.5	157.0	24.4	31.8	10 - 50	0 - 0
CR-C07H	13.5	0.0	0.0	0.0	61.2	210.5	16.7	16.7	10 - 50	0 - 0
CR-H01	1.4	--	--	--	--	--	--	--	--	--
CR-H02	17.2	61.6	65.8	54.0	0.0	0.0	0.0	54.0	10 - 50	0 - 0
CR-H04A	7.3	0.0	0.0	0.0	143.0	326.3	58.5	58.5	10 - 50	0 - 0
CR-H05A	8.3	30.6	20.4	29.4	87.7	116.0	63.9	93.3	10 - 50	0 - 0
CR-H06A	43.0	40.1	25.5	38.9	49.2	84.8	38.4	77.3	10 - 50	0 - 0
CR-H15	64.9	17.8	13.4	16.9	14.9	15.1	4.8	21.7	10 - 50	0 - 0
CR-H16	76.1	36.1	75.4	28.6	13.5	17.7	4.2	32.8	10 - 50	0 - 0
CR-H17	34.2	35.6	28.6	32.1	3.2	6.4	1.0	33.1	10 - 50	0 - 0
CR-H19	4.0	0.0	0.0	0.0	90.0	52.2	0.0	0.0	10 - 50	0 - 0
CR-H20	37.0	69.5	60.7	62.6	13.9	37.1	5.7	68.3	10 - 50	0 - 0

MZ ID	Mesic Flatwoods (Acres)	Current Average Overstory Conditions							Target Overstory Conditions	
		Pine BA (ft <sup>2</sup> /ac)	Pine TPA	Pine Volume (tons/ac)	Non-Pine BA (ft <sup>2</sup> /ac)	Non-Pine TPA	Non-Pine Volume (tons/ac)	Total Pine and Non-Pine Volume (tons/ac)	FNAI Reference Condition Pine BA Range (ft <sup>2</sup> /ac)	FNAI Reference Condition Non-Pine TPA Range
CR-H21	48.4	17.0	11.3	16.3	38.1	64.1	18.8	35.1	10 - 50	0 - 0
CR-H22	30.8	12.0	32.8	9.7	0.0	0.0	0.0	9.7	10 - 50	0 - 0
CR-H23	36.1	25.1	16.8	21.3	12.0	15.7	6.5	27.8	10 - 50	0 - 0
CR-H24	64.1	31.3	25.3	28.4	17.8	40.2	12.2	40.5	10 - 50	0 - 0
CR-H25	8.1	40.6	33.5	36.2	20.5	33.9	13.8	50.1	10 - 50	0 - 0
CR-H26	5.7	28.8	29.9	27.0	24.2	32.6	15.4	42.4	10 - 50	0 - 0
CR-H27	65.2	29.7	32.4	27.0	12.1	26.6	8.9	36.0	10 - 50	0 - 0
CR-H28	21.4	42.5	33.1	39.0	18.6	31.5	7.9	47.0	10 - 50	0 - 0
CR-H29	43.2	26.4	25.9	24.4	33.7	84.3	18.3	42.6	10 - 50	0 - 0
CR-H30	14.5	50.6	35.0	47.7	26.9	69.9	9.6	57.3	10 - 50	0 - 0
CR-H32	34.9	23.4	18.2	22.3	43.0	121.5	32.7	55.0	10 - 50	0 - 0
CR-H33	38.1	41.4	36.7	38.9	11.1	22.1	6.7	45.6	10 - 50	0 - 0
CR-H33E	10.9	48.9	40.8	45.3	5.3	1.4	0.0	45.3	10 - 50	0 - 0
CR-H34	18.2	56.3	60.4	51.8	2.7	1.7	2.5	54.3	10 - 50	0 - 0
CR-H64	2.6	45.5	60.8	34.8	10.4	16.9	7.4	42.2	10 - 50	0 - 0
CR-H66	52.2	26.9	31.8	22.9	31.3	55.8	24.6	47.5	10 - 50	0 - 0
CR-H67	41.1	30.2	42.5	24.9	11.4	16.6	1.0	25.9	10 - 50	0 - 0
CR-H70A	15.5	47.4	43.3	40.4	10.6	11.7	0.0	40.4	10 - 50	0 - 0
CR-H70B	2.9	--	--	--	--	--	--	--	--	--
CR-H71A	85.3	15.2	8.0	16.2	60.3	101.0	5.9	22.1	10 - 50	0 - 0
CR-H71B	72.5	23.0	29.2	17.8	26.3	24.5	9.5	27.4	10 - 50	0 - 0
CR-H72	37.8	23.2	19.3	22.4	0.0	0.0	0.0	22.4	10 - 50	0 - 0
CR-H73	4.5	12.0	9.6	12.3	0.0	0.0	0.0	12.3	10 - 50	0 - 0
CR-H75	20.0	27.7	19.5	27.5	0.0	0.0	0.0	27.5	10 - 50	0 - 0
CR-S03	28.7	--	--	--	--	--	--	--	--	--
CR-S04	23.5	--	--	--	--	--	--	--	--	--
<b>Total</b>	<b>1,414.2</b>									

### Sandhill (62.5 acres)

Longleaf pine (*Pinus palustris*) is the preferred overstory pine species in the region. The FNAI reference site in this region for sandhill contains longleaf pine at a basal area (BA) of 20 to 60 square feet per acre with non-pine at a density of 0 to 79 trees per acre (TPA). The following table shows the overstory condition for this natural community at Crystal River and target overstory condition for sandhill in this region.

MZ ID	Sandhill (Acres)	Current Average Overstory Conditions							Target Overstory Conditions	
		Pine BA (ft <sup>2</sup> /ac)	Pine TPA	Pine Volume (tons/ac)	Non-Pine BA (ft <sup>2</sup> /ac)	Non-Pine TPA	Non-Pine Volume (tons/ac)	Total Pine and Non-Pine Volume (tons/ac)	FNAI Reference Condition Pine BA Range (ft <sup>2</sup> /ac)	FNAI Reference Condition Non-Pine TPA Range
CR-C07C	11.8	0.0	0.0	0.0	58.4	272.1	23.9	23.9	20 - 60	0 - 79
CR-C07D	2.2	--	--	--	--	--	--	--	--	--
CR-C07E	1.5	--	--	--	--	--	--	--	--	--
CR-C07F	14.9	31.9	33.7	28.9	55.2	64.6	38.6	67.5	20 - 60	0 - 79
CR-C07G	0.3	--	--	--	--	--	--	--	--	--
CR-C07H	21.5	31.4	20.8	28.9	5.1	9.5	3.3	32.3	20 - 60	0 - 79
CR-H20	8.4	22.9	15.8	23.3	11.0	4.1	0.0	23.3	20 - 60	0 - 79
CR-H21	0.2	--	--	--	--	--	--	--	--	--
CR-H24	0.9	--	--	--	--	--	--	--	--	--
CR-H25	0.3	--	--	--	--	--	--	--	--	--
CR-S03	0.5	--	--	--	--	--	--	--	--	--
<b>Total</b>	<b>62.5</b>									

**Scrub (169.3 acres)**

Slash pine (*Pinus elliottii*) and longleaf pine (*Pinus palustris*) are the preferred overstory pine species in the region. The FNAI reference site in this region for scrub contains slash and longleaf pine at a basal area (BA) of 0 to 20 square feet per acre with non-pine at a density of 0 to 13 trees per acre (TPA). The following table shows the overstory condition for this natural community at Crystal River and target overstory condition for scrub in this region.

MZ ID	Scrub (Acres)	Current Average Overstory Conditions							Target Overstory Conditions	
		Pine BA (ft <sup>2</sup> /ac)	Pine TPA	Pine Volume (tons/ac)	Non-Pine BA (ft <sup>2</sup> /ac)	Non-Pine TPA	Non-Pine Volume (tons/ac)	Total Pine and Non-Pine Volume (tons/ac)	FNAI Reference Condition Pine BA Range (ft <sup>2</sup> /ac)	FNAI Reference Condition Non-Pine TPA Range
CR-C07C	18.3	0.0	0.0	0.0	14.1	141.4	0.0	0.0	0 - 20	0 - 13
CR-S03	71.0	--	--	--	--	--	--	--	--	--
CR-S04	80.0	--	--	--	--	--	--	--	--	--
<b>Total</b>	<b>169.3</b>									

**Scrubby Flatwoods (425.4 acres)**

Slash pine (*Pinus elliottii*) and longleaf pine (*Pinus palustris*) are the preferred overstory pine species in the region. The FNAI reference site in this region for scrubby flatwoods contains slash and 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 Crystal River and target overstory condition for scrubby flatwoods in this region.

MZ ID	Scrubby Flatwoods (Acres)	Current Average Overstory Conditions							Target Overstory Conditions	
		Pine BA (ft <sup>2</sup> /ac)	Pine TPA	Pine Volume (tons/ac)	Non-Pine BA (ft <sup>2</sup> /ac)	Non-Pine TPA	Non-Pine Volume (tons/ac)	Total Pine and Non-Pine Volume (tons/ac)	FNAI Reference Condition Pine BA Range (ft <sup>2</sup> /ac)	FNAI Reference Condition Non-Pine TPA Range
CR-C03	8.0	0.0	0.0	0.0	85.9	504.9	0.0	0.0	10 - 60	0 - 26
CR-C03A	43.5	30.3	79.3	21.2	53.0	163.0	9.9	31.1	10 - 60	0 - 26
CR-C03B	13.0	15.7	16.1	12.5	8.2	29.0	0.0	12.5	10 - 60	0 - 26
CR-C03C	15.3	72.9	180.7	48.1	19.1	79.4	4.4	52.5	10 - 60	0 - 26
CR-C03D	7.5	6.2	8.2	3.7	0.0	0.0	0.0	3.7	10 - 60	0 - 26
CR-C03J	8.3	--	--	--	--	--	--	--	--	--
CR-C05A	26.8	44.0	71.1	32.5	10.5	11.1	9.9	42.5	10 - 60	0 - 26
CR-C05B	18.9	--	--	--	--	--	--	--	--	--
CR-C05C	34.8	10.5	6.8	10.2	74.3	324.6	27.9	38.1	10 - 60	0 - 26
CR-C05D	20.0	20.5	11.2	17.7	26.7	186.7	0.0	17.7	10 - 60	0 - 26
CR-C05E	20.4	--	--	--	--	--	--	--	--	--
CR-C05F	33.5	--	--	--	--	--	--	--	--	--
CR-C05G	13.8	21.3	14.7	17.6	0.0	0.0	0.0	17.6	10 - 60	0 - 26
CR-C05K	1.3	--	--	--	--	--	--	--	--	--
CR-C07A	20.9	10.1	10.9	9.7	90.8	394.7	13.7	23.3	10 - 60	0 - 26
CR-C07B	16.4	0.0	0.0	0.0	42.7	125.3	0.0	0.0	10 - 60	0 - 26
CR-C07C	4.7	--	--	--	--	--	--	--	--	--
CR-C07D	4.6	--	--	--	--	--	--	--	--	--
CR-C07E	6.0	--	--	--	--	--	--	--	--	--
CR-C07F	9.5	39.3	99.8	28.5	7.3	4.5	0.0	28.5	10 - 60	0 - 26
CR-C07G	9.5	38.1	31.6	35.8	7.4	19.0	5.1	41.0	10 - 60	0 - 26
CR-C07H	3.5	41.4	32.4	39.2	20.4	54.6	15.7	54.9	10 - 60	0 - 26
CR-H01	3.2	--	--	--	--	--	--	--	--	--
CR-H04A	19.8	4.4	4.5	3.7	66.2	122.1	30.7	34.3	10 - 60	0 - 26
CR-H25	1.1	--	--	--	--	--	--	--	--	--
CR-H73	0.4	--	--	--	--	--	--	--	--	--
CR-S03	17.5	15.8	10.4	14.6	33.6	131.8	13.7	28.3	10 - 60	0 - 26
CR-S04	41.9	--	--	--	--	--	--	--	--	--
CR-W12	1.3	--	--	--	--	--	--	--	--	--

MZ ID	Scrubby Flatwoods (Acres)	Current Average Overstory Conditions							Target Overstory Conditions	
		Pine BA (ft <sup>2</sup> /ac)	Pine TPA	Pine Volume (tons/ac)	Non-Pine BA (ft <sup>2</sup> /ac)	Non-Pine TPA	Non-Pine Volume (tons/ac)	Total Pine and Non-Pine Volume (tons/ac)	FNAI Reference Condition Pine BA Range (ft <sup>2</sup> /ac)	FNAI Reference Condition Non-Pine TPA Range
<b>Total</b>	<b>425.4</b>									

**Upland Mixed Woodland (30.2 acres)**

Longleaf pine (*Pinus palustris*) and southern red oak (*Quercus falcata*) are the preferred overstory species in the region. The FNAI reference site in this region for upland mixed woodland contains longleaf pine at a basal area (BA) of 10 to 30 square feet per acre with non-pine at a density of 26 to 132 trees per acre (TPA). The following table shows the overstory condition for this natural community at Crystal River and target overstory condition for upland mixed woodland in this region.

MZ ID	Upland Mixed Woodland (Acres)	Current Average Overstory Conditions							Target Overstory Conditions	
		Pine BA (ft <sup>2</sup> /ac)	Pine TPA	Pine Volume (tons/ac)	Non-Pine BA (ft <sup>2</sup> /ac)	Non-Pine TPA	Non-Pine Volume (tons/ac)	Total Pine and Non-Pine Volume (tons/ac)	FNAI Reference Condition Pine BA Range (ft <sup>2</sup> /ac)	FNAI Reference Condition Non-Pine TPA Range
CR-H29	1.6	77.7	90.4	65.0	0.0	0.0	0.0	65.0	10 - 30	26 - 132
CR-H30	1.7	--	--	--	--	--	--	--	--	--
CR-H33	12.4	27.1	20.9	25.0	75.8	162.6	34.6	59.7	10 - 30	26 - 132
CR-H33E	8.6	11.7	7.5	12.2	0.0	0.0	0.0	12.2	10 - 30	26 - 132
CR-H66	0.3	--	--	--	--	--	--	--	--	--
CR-H69	0.5	--	--	--	--	--	--	--	--	--
CR-H73	5.1	--	--	--	--	--	--	--	--	--
<b>Total</b>	<b>30.2</b>									

**Wet Flatwoods (241.4 acres)**

Longleaf pine (*Pinus palustris*) and slash pine (*Pinus elliottii*) are the preferred overstory pine species in the region. The FNAI reference site in this region for wet flatwoods contains longleaf and slash 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 Crystal River and target overstory condition for wet flatwoods in this region.

MZ ID	Wet Flatwoods (Acres)	Current Average Overstory Conditions							Target Overstory Conditions	
		Pine BA (ft <sup>2</sup> /ac)	Pine TPA	Pine Volume (tons/ac)	Non-Pine BA (ft <sup>2</sup> /ac)	Non-Pine TPA	Non-Pine Volume (tons/ac)	Total Pine and Non-Pine Volume (tons/ac)	FNAI Reference Condition Pine BA Range (ft <sup>2</sup> /ac)	FNAI Reference Condition Non-Pine TPA Range
CR-C03	15.3	45.8	49.3	36.1	62.9	214.8	35.0	71.1	10 - 50	0 - 0
CR-C03A	2.0	62.7	90.5	47.8	38.9	81.0	0.0	47.8	10 - 50	0 - 0
CR-H01	27.7	47.8	40.7	44.6	13.6	12.5	6.3	50.9	10 - 50	0 - 0
CR-H02	35.6	44.3	32.5	40.5	17.7	41.7	1.2	41.7	10 - 50	0 - 0
CR-H35	12.7	33.9	40.7	29.6	4.3	37.7	0.0	29.6	10 - 50	0 - 0
CR-H37	61.9	--	--	--	--	--	--	--	--	--
CR-H66	2.8	--	--	--	--	--	--	--	--	--
CR-H72	33.7	--	--	--	--	--	--	--	--	--
CR-H73	43.0	32.8	48.5	28.0	25.3	26.6	22.7	50.7	10 - 50	0 - 0
CR-H75	6.7	57.0	43.2	55.4	0.0	0.0	0.0	55.4	10 - 50	0 - 0
<b>Total</b>	<b>241.4</b>									

# 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 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 reference site descriptions established by the Florida Natural Areas Inventory (FNAI).

The feasibility of harvesting timber at Fort Clinch State Park (Fort Clinch) during the period covered by this plan was considered in the context of the Division of Recreation and Parks' (DRP) statutory responsibilities and an analysis of the park's resource needs and values. Fort Clinch is located in Nassau County and is designated as a single-use park. As such, timber management is only permitted as a method of natural community (NatCom) restoration and maintenance rather than as an ongoing extractive activity. In the case of imperiled species, the management of certain NatComs may differ from standard treatments to provide optimum habitat conditions within the park. In some circumstances, timber management may include the harvesting and removal of invasive/exotic overstory trees. Please note that any NatCom acreage changes and NatCom treatments occurring after June 2022 are not reflected in this analysis. DRP has contracted with a private sector, professional forest management firm to complete this timber management analysis: F4 Tech.

Fort Clinch is located at the northern end of Amelia Island and comprises 2,178 acres partitioned into 11 management zones. According to management zone and NatCom boundary GIS data provided by DRP in June 2022 and general desktop assessments of publicly-available aerial imagery, the only forested, upland potential candidate NatCom type for revenue generation and parcel enhancement through timber management would be maritime hammock (58 NatCom polygons; 787 acres ranging in size from 0.02 to 117.6 acres).

Maritime hammock is a hardwood-dominated NatCom type, which DRP does not manage for timber resources, e.g., harvesting, and standard silvicultural operations are not aligned with long-term NatCom and park management goals. The long-term goal for the subject stands, which are likely late-successional in-terms of development stage, is to allow continued development without intervention. DRP staff have also indicated that maritime hammock areas within these management zones represent some of the most outstanding examples of this natural community in Florida (2017 Fort Clinch UMP). Based on this information, it was concluded that timber management and attendant actions are not needed nor viable for restoring and maintaining forested natural communities at Fort Clinch.

During the period of this UMP, active management of all forested NatCom polygons could be necessary and appropriate in the wake of natural disturbances such as hurricanes, droughts, insect/disease infestations, and invasive/exotic species outbreaks should such events pose a significant threat to forest resources and ecosystem conditions within the park.



## **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.

Fort Cooper State Park (Fort Cooper) 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 Fort Cooper during the period covered by the Unit Management Plan (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 reference site descriptions 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 Fort Cooper had overstory pine stocking levels generally below the ranges identified for corresponding FNAI Reference Sites. Conversely, non-pine (hardwood) overstory stocking levels were generally within the ranges 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.

**Addendum \_\_\_\_\_**  
**Timber Management Analysis**

**1. Management Context and Best Management Practices**

Timber management at Fort Cooper State Park (Fort Cooper) is based on the desired future condition (DFC) of a management zone or natural community (NatCom) as determined by the DRP Unit Management Plan (UMP), 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 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 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 fires, windstorms, insects, 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-strikes 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 a buffer zone might have to be removed to prevent significant damage.

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

Fort Cooper comprises 708 acres in Citrus County. A total of 347 acres are associated with two (2) upland NatCom types that are potential candidates for timber management. In September 2017, an inventory based on field plots was conducted across and within these areas to quantify overstory, midstory and understory conditions. Tree data captured in the 2017 inventory was grown-to-current (circa 2022) for this timber assessment using an industry-standard growth and yield model developed and maintained by the U.S. Forest Service (Forest Vegetation Simulator). 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 June 2022. 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 Fort Cooper, 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 June 2022 period may not be reflected in the following tables.

**Table 1. General summary statistics for Fort Cooper.**

Number of Management Zones within the Park	12
Upland NatCom acres	528

**Mesic Flatwoods (25.8 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 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 Fort Cooper 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 <sup>2</sup> /ac)	Pine TPA	Pine Volume (tons/ac)	Non-Pine BA (ft <sup>2</sup> /ac)	Non-Pine TPA	Non-Pine Volume (tons/ac)	Total Pine and Non-Pine Volume (tons/ac)	FNAI Reference Condition Pine BA Range (ft <sup>2</sup> /ac)	FNAI Reference Condition Non-Pine TPA Range
FC-02	4.6	7.4	14.5	5.1	26.6	24.2	3.7	8.9	10 - 50	0 - 0
FC-04	4.4	--	--	--	--	--	--	--	--	--
FC-12	16.8	0.0	0.0	0.0	71.4	56.5	48.9	48.9	10 - 50	0 - 0
<b>Total</b>	<b>25.8</b>									

**Sandhill (321.3 acres)**

Longleaf pine (*Pinus palustris*) is the preferred overstory pine species in the region. The FNAI reference site in this region for sandhill contains longleaf pine at a basal area (BA) of 20 to 60 square feet per acre with non-pine at a density of 0 to 79 trees per acre (TPA). The following table shows the overstory condition for this natural community at Fort Cooper and target overstory condition for sandhill in this region.

MZ ID	Sandhill (Acres)	Current Average Overstory Conditions							Target Overstory Conditions	
		Pine BA (ft <sup>2</sup> /ac)	Pine TPA	Pine Volume (tons/ac)	Non-Pine BA (ft <sup>2</sup> /ac)	Non-Pine TPA	Non-Pine Volume (tons/ac)	Total Pine and Non-Pine Volume (tons/ac)	FNAI Reference Condition Pine BA Range (ft <sup>2</sup> /ac)	FNAI Reference Condition Non-Pine TPA Range
FC-01	74.4	6.7	16.1	4.2	32.5	94.0	4.4	8.6	20 - 60	0 - 79
FC-02	16.1	0.0	0.0	0.0	24.5	62.1	1.5	1.5	20 - 60	0 - 79
FC-03	63.4	12.0	11.4	10.0	40.8	132.1	13.1	23.1	20 - 60	0 - 79
FC-04	89.8	6.4	12.0	4.4	37.1	71.9	15.4	19.8	20 - 60	0 - 79
FC-06	33.6	79.0	94.4	66.5	17.3	70.0	4.2	70.8	20 - 60	0 - 79
FC-07	10.1	45.0	44.8	38.7	8.7	15.8	6.9	45.6	20 - 60	0 - 79
FC-08	0.9	--	--	--	--	--	--	--	--	--
FC-09	27.7	9.4	2.9	10.1	51.7	60.4	43.4	53.5	20 - 60	0 - 79
FC-10	0.9	--	--	--	--	--	--	--	--	--

MZ ID	Sandhill (Acres)	Current Average Overstory Conditions							Target Overstory Conditions	
		Pine BA (ft <sup>2</sup> /ac)	Pine TPA	Pine Volume (tons/ac)	Non-Pine BA (ft <sup>2</sup> /ac)	Non-Pine TPA	Non-Pine Volume (tons/ac)	Total Pine and Non-Pine Volume (tons/ac)	FNAI Reference Condition Pine BA Range (ft <sup>2</sup> /ac)	FNAI Reference Condition Non-Pine TPA Range
FC-12	4.5	9.1	6.4	6.4	53.3	178.7	0.0	6.4	20 - 60	0 - 79
<b>Total</b>	<b>321.3</b>									

# **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.

Mike Roess Gold Head Branch State Park (Gold Head Branch) 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 Gold Head Branch during the period covered by the Unit Management Plan 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 Gold Head Branch had overstory pine stocking levels generally below the range identified for corresponding FNAI Reference Sites. Conversely, non-pine (hardwood) overstory stocking levels were generally within the range 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 Mike Roess Gold Head Branch State Park (Gold Head Branch) is based on the desired future condition (DFC) of a management zone or natural community (NatCom) as determined by the DRP Unit Management Plans (UMP), along with guidelines developed by the 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 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 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.

## Florida State Parks Timber Management Analysis

On occasion, salvage cuts may need to be conducted to remove small volumes of wood damaged by fire, windstorm, 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-strikes 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**

Gold Head Branch comprises 2,367 acres in Clay County. A total of 1,924 acres are associated with three (3) upland NatCom types that are potential candidates for timber management. In April 2016, 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 Gold Head Branch, 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 Gold Head Branch State Park**

Number of Management Zones within the Park	50
Upland NatCom acres	1,954

### **Mesic Flatwoods (23.2 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 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 Gold Head Branch and target overstory condition for mesic flatwoods in this region.



## Florida State Parks Timber Management Analysis

MZ ID	Mesic Flatwoods (Acres)	Current Average Overstory Conditions							Target Overstory Conditions	
		Pine BA (ft <sup>2</sup> /ac)	Pine TPA	Pine Volume (tons/ac)	Non-Pine BA (ft <sup>2</sup> /ac)	Non-Pine TPA	Non-Pine Volume (tons/ac)	Total Pine and Non-Pine Volume (tons/ac)	FNAI Reference Condition Pine BA Range (ft <sup>2</sup> /ac)	FNAI Reference Condition Non-Pine TPA Range
GH-1Fe	2.7	0.0	0.0	0.0	50.0	89.2	0.0	0.0	10 - 50	0 - 0
GH-1Fw	3.9	30.0	19.6	27.4	80.0	108.9	0.0	27.4	10 - 50	0 - 0
GH-2G	2.8	--	--	--	--	--	--	--	--	--
GH-5A	9.1	70.0	51.0	64.6	0.0	0.0	0.0	64.6	10 - 50	0 - 0
GH-5B	4.8	30.0	28.0	30.6	33.3	70.0	25.4	56.0	10 - 50	0 - 0
<b>Total</b>	<b>23.2</b>									

### Sandhill (1,766.6 acres)

Longleaf pine (*Pinus palustris*) is the preferred overstory pine species in the region. The FNAI reference site in this region for sandhill contains longleaf pine at a basal area (BA) of 20 to 60 square feet per acre with non-pine species between 0 and 79 trees per acre (TPA). The following table shows the overstory condition for this natural community at Gold Head Branch and target overstory condition for sandhill in this region.

MZ ID	Sandhill (Acres)	Current Average Overstory Conditions							Target Overstory Conditions	
		Pine BA (ft <sup>2</sup> /ac)	Pine TPA	Pine Volume (tons/ac)	Non-Pine BA (ft <sup>2</sup> /ac)	Non-Pine TPA	Non-Pine Volume (tons/ac)	Total Pine and Non-Pine Volume (tons/ac)	FNAI Reference Condition Pine BA Range (ft <sup>2</sup> /ac)	FNAI Reference Condition Non-Pine TPA Range
GH-1A	19.1	10.0	19.8	6.7	6.0	22.2	1.3	8.0	20 - 60	0 - 79
GH-1B	18.1	27.5	88.1	16.0	2.5	12.7	0.0	16.0	20 - 60	0 - 79
GH-1Ce	35.7	13.3	51.6	7.4	5.0	23.9	2.0	9.3	20 - 60	0 - 79
GH-1Cw	36.5	21.7	67.6	13.2	6.7	23.7	3.9	17.0	20 - 60	0 - 79
GH-1D	55.2	20.0	47.8	13.7	10.0	34.3	4.3	17.9	20 - 60	0 - 79
GH-1Ee	49.9	27.5	66.7	17.8	1.3	2.4	1.0	18.7	20 - 60	0 - 79
GH-1Ew	28.0	8.3	10.9	5.9	15.0	36.9	5.1	11.0	20 - 60	0 - 79
GH-1Fe	60.3	2.7	9.2	1.6	10.9	34.4	2.3	4.0	20 - 60	0 - 79
GH-1Fw	34.7	38.6	133.0	23.6	21.4	50.5	7.1	30.8	20 - 60	0 - 79
GH-2A	36.1	14.0	35.8	9.0	10.0	47.8	3.0	11.9	20 - 60	0 - 79
GH-2B	115.4	16.8	55.9	10.2	10.0	27.5	5.4	15.6	20 - 60	0 - 79
GH-2C	67.9	10.0	37.4	5.6	13.6	59.0	3.9	9.6	20 - 60	0 - 79
GH-2D	45.7	2.9	7.5	1.6	14.3	51.9	3.8	5.4	20 - 60	0 - 79
GH-2E	108.3	13.0	46.4	6.4	16.5	61.4	5.9	12.3	20 - 60	0 - 79
GH-2F	79.9	14.0	54.2	7.6	22.0	64.0	9.1	16.6	20 - 60	0 - 79

**Florida State Parks  
Timber Management Analysis**

MZ ID	Sandhill (Acres)	Current Average Overstory Conditions							Target Overstory Conditions	
		Pine BA (ft <sup>2</sup> /ac)	Pine TPA	Pine Volume (tons/ac)	Non-Pine BA (ft <sup>2</sup> /ac)	Non-Pine TPA	Non-Pine Volume (tons/ac)	Total Pine and Non-Pine Volume (tons/ac)	FNAI Reference Condition Pine BA Range (ft <sup>2</sup> /ac)	FNAI Reference Condition Non-Pine TPA Range
GH-2G	26.0	6.0	8.7	4.1	56.0	167.2	25.7	29.7	20 - 60	0 - 79
GH-3A	15.5	10.0	37.5	5.3	2.5	21.7	0.0	5.3	20 - 60	0 - 79
GH-3B	16.9	4.0	3.2	2.7	40.0	146.3	14.1	16.8	20 - 60	0 - 79
GH-3C	17.3	12.5	12.5	9.2	57.5	291.1	5.7	14.9	20 - 60	0 - 79
GH-3D	20.2	12.5	24.7	9.2	37.5	146.2	18.2	27.4	20 - 60	0 - 79
GH-3E	27.6	17.8	74.9	10.4	30.0	109.6	13.3	23.7	20 - 60	0 - 79
GH-3F	11.0	5.0	2.6	4.4	70.0	270.6	18.3	22.7	20 - 60	0 - 79
GH-3G	21.1	18.0	127.2	7.5	8.0	20.4	3.6	11.1	20 - 60	0 - 79
GH-4A	0.1	--	--	--	--	--	--	--	--	--
GH-5A	3.6	--	--	--	--	--	--	--	--	--
GH-5B	0.7	0.0	0.0	0.0	60.0	191.7	6.1	6.1	20 - 60	0 - 79
GH-6A	15.6	2.5	16.3	0.0	0.0	0.0	0.0	0.0	20 - 60	0 - 79
GH-6B	39.6	3.3	8.6	2.1	18.3	39.2	1.2	3.3	20 - 60	0 - 79
GH-6C	27.0	23.3	35.7	17.2	8.3	16.9	4.3	21.5	20 - 60	0 - 79
GH-6D	0.8	--	--	--	--	--	--	--	--	--
GH-6E	16.0	6.7	11.2	4.5	10.0	6.5	5.3	9.8	20 - 60	0 - 79
GH-7A	40.4	12.9	34.4	8.1	15.7	88.2	5.1	13.2	20 - 60	0 - 79
GH-7B	82.6	7.1	21.7	4.2	22.9	87.7	11.4	15.6	20 - 60	0 - 79
GH-7C	60.3	3.0	4.0	2.0	12.0	56.6	3.7	5.6	20 - 60	0 - 79
GH-7D	3.9	--	--	--	--	--	--	--	--	--
GH-7E	1.8	--	--	--	--	--	--	--	--	--
GH-7F	9.6	12.5	33.5	6.6	7.5	63.9	0.0	6.6	20 - 60	0 - 79
GH-7G	92.0	2.0	5.8	1.1	8.0	29.1	2.8	3.9	20 - 60	0 - 79
GH-7H	103.2	13.5	49.0	7.7	13.5	37.1	5.0	12.6	20 - 60	0 - 79
GH-7J	97.4	17.5	59.1	10.4	16.9	85.1	2.7	13.2	20 - 60	0 - 79
GH-7K	4.4	--	--	--	--	--	--	--	--	--
GH-7L	11.0	5.0	34.3	1.5	10.0	77.3	0.0	1.5	20 - 60	0 - 79
GH-7M	19.2	22.0	69.6	12.7	12.0	58.0	4.7	17.4	20 - 60	0 - 79
GH-8A	90.4	14.3	47.0	8.0	21.4	99.9	2.8	10.9	20 - 60	0 - 79
GH-8B	100.9	10.6	25.1	5.9	17.7	72.4	5.7	11.5	20 - 60	0 - 79
<b>Total</b>	<b>1,766.6</b>									

**Scrub (134.3 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

# Florida State Parks Timber Management Analysis

natural community at Gold Head Branch and target overstory condition for scrub in this region.

MZ ID	Scrub (Acres)	Current Average Overstory Conditions							Target Overstory Conditions	
		Pine BA (ft <sup>2</sup> /ac)	Pine TPA	Pine Volume (tons/ac)	Non-Pine BA (ft <sup>2</sup> /ac)	Non-Pine TPA	Non-Pine Volume (tons/ac)	Total Pine and Non-Pine Volume (tons/ac)	FNAI Reference Condition Pine BA Range (ft <sup>2</sup> /ac)	FNAI Reference Condition Non-Pine TPA Range
GH-6A	12.8	--	--	--	--	--	--	--	--	--
GH-6B	14.9	--	--	--	--	--	--	--	--	--
GH-7D	12.2	--	--	--	--	--	--	--	--	--
GH-7E	33.0	--	--	--	--	--	--	--	--	--
GH-7F	33.9	--	--	--	--	--	--	--	--	--
GH-7K	16.9	--	--	--	--	--	--	--	--	--
GH-7L	10.7	--	--	--	--	--	--	--	--	--
<b>Total</b>	<b>134.3</b>									

# Timber Management Analysis

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Ichetucknee Springs State Park McCormick Sink  
Tract  
Timber Assessment

Prepared By:  
Doug Longshore  
Senior Forester, Other State Lands, Region 2 Florida Division of  
Forestry  
May 29, 2008

## I. Purpose

This document is intended to fulfill the timber assessment requirement for the McCormick Sink Tract as required by Section 1. Section 253.036, Florida Statutes. The goal of this Timber Assessment is to evaluate the potential and feasibility of managing timber resources for conservation and revenue generation purposes.

## II. Background

The McCormick Sink Tract, comprised of 150 acres, was purchased by the Trust for Public Lands in 2005 from the McCormick family who had owned it since 1947. They farmed portions of this tract during this time and subsequently planted pines on the former agricultural fields.

This property was purchased for management as part of Ichetucknee Springs State Park in order to protect this section of the Ichetucknee Trace which lies above a portion of the underground cave system that feeds the Ichetucknee River. It was also purchased to specifically protect McCormick Sink which connects directly to the underground conduits.

Historically, this tract was upland hardwood and upland pine hardwood. Much of the upland pine hardwood areas have been severely impacted by agricultural land clearing activities that took place in the late 1930's and early 1940's. In addition, fire exclusion from the area as a whole, has had a negative impact on the health and vigor of the natural communities.

Presently, the tract is comprised of 73 acres of planted slash pine in two distinct age classes. Eleven acres is approximately 25 years old. The remaining 62 acres is approximately 18 years old. All of the slash pine is growing on former agricultural fields. As evidenced by the old stump rows found in the existing plantation, this is the second crop of trees to have been grown on these "old fields". The remaining 77 acres is comprised of upland hardwood. Timber management guidelines are not included for the upland hardwood areas. No forestry activities are planned for these areas as they are a primary buffer for the numerous sinkholes found in the area.

## **Timber Management Analysis**

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### III. Goals and Objectives Related to Timber Management

The following are Goals and Objectives as outlined in the Ichetucknee Springs Unit Management Plan that relate directly to timber management.

1. Restore natural communities within the park
2. Create or improve perimeter and internal firebreaks where necessary in order to introduce prescribed fire to the upland pine forest.

### IV. General Management Guidelines

Basal Area per acre (BA) will be the primary measurement tool in providing management recommendations for thinning of appropriate pine plantations on the McCormick tract. BA is the cross sectional area (in square feet) of a tree measured four and one-half feet above the ground. (Diameter of trees measured at this height is referred to as its diameter at breast height or DBH). BA can be used to define stocking rates in determining the timing and rate of a thinning treatment. Fully-stocked pine stands have enough trees per acre of a size or sizes larger enough to utilize growing space without causing overcrowding, which can lead to an increased risk of insect and disease mortality. Longleaf, slash and sand pine stands with 70 to 100 square feet of BA are considered fully stocked. It requires more, smaller diameter trees than larger diameter trees to equal one square foot of BA. (For example: It takes 357 evenly spaced six-inch dbh trees to equal 70 square R of BA, whereas only 89 twelve-inch dbh trees per acre equal the same 70 square feet of BA)

The average BA for the 25 year old slash pine is 120 square feet per acre. The 18 year old slash pine averages 100 square feet per acre. The variation in stocking rates is due in part to differences in site quality (second crop of trees), but also from survival rates of plantings, and the amount of trees that have naturally succumbed to fusiform rust and stand competition. Basal area can be roughly correlated to crown density, and therefore to needle-cast. Generally, 40 to 60 square feet of BA should provide enough needle-cast to carry prescribed fire and adequate sunlight for maintenance of natural grass communities.

Thinning type harvests in pine plantations help in maintaining the health and vigor of the stands by removing diseased, severely suppressed, and deformed trees. Properly applied thinnings are also useful in enhancing the development of understory and groundcover communities which can provide a diversity of habitat for a wide variety of wildlife species. Initial thinning methods would remove every third or fifth row of pines, and selective harvesting of forked, diseased and suppressed in the intermediate rows (third-row select or fifth-row select). A small percentage of co-dominant trees need to be harvested also to meet the desired residual BA. Stand BA's should be reduced to approximately 70-80 square feet per acre (dependent on BA before treatment) during initial treatment, and thinned again whenever they contain >100 square feet of BA per acre. A general recommendation in southern pine stands is to remove no more than a third of the

## **Timber Management Analysis**

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existing BA per acre during one treatment (For example: In a stand with 150 of square feet of BA, thin back to 100 square feet of BA per acre). This will help to minimize windthrow damage in residual trees.

### V. Recommendations

The majority of pine stand acreage on McCormick Sink Tract is comprised of two major age classes. The primary focus in forest management methods will consist of implementing various silvicultural methods in these pine plantations for the purpose of maintaining the health and vigor of the existing stand and eventually reestablishing natural community types.

The use of prescribed fire in all of these pine plantations is a necessary tool for reestablishing natural overstory and groundcover communities. All planted pine stands should be prescribed burned to reduce the shading effects of excessive hardwood stems and reduce fuels.

#### A. Slash Pine Timber

##### Management

The slash pine plantations for the most part are well-stocked, although hardwood competition is a problem throughout much of these stands. Most of these areas are well-suited to a third-row select thinning, although it will be necessary to control existing hardwoods with herbicides and/or prescribed burning within several years after thinning operations have been completed. Thinnings can be done in the slash pine stands to promote groundcover restoration and gopher tortoise habitat, with a long-term goal of converting these stands to longleaf pine. During the initial thinning, clearcut a small, patchwork of openings throughout the stand. These openings would comprise approximately twenty five per cent of the total stand area, or approximately 20 acres. Properly located loading ramps and skid trails could be included in these planned openings.

These areas would later be cleared to allow mechanical seeding of native ground cover species and the planting of longleaf pine seedlings. These areas would later become the seed source for the natural seeding of adjacent areas.

### VI. Prescribed Burning

There was no evidence of recent fires on the McCormick Sink Tract. As a result, groundcover conditions have deteriorated, and hardwood competition is moderate- heavy throughout most of the pine stands. Prescribed burning is an essential land management tool for restoring and maintaining Florida's natural pine communities. Properly applied prescribed burns provide many benefits: Reduction of wildfire hazard, groundcover restoration, hardwood and woody shrub control, wildlife

## **Timber Management Analysis**

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habitat improvement, and overall more natural open-stand conditions. Firelines should be reestablished and possibly relocated further away from sinkholes. Winter prescribed burns should initially be conducted in pine stands. Upon completion of the thinning operation, a shift to growing season burns could then be made.

### VII. Summary

The McCormick Sink Tract has potential for natural community restoration. This will be a long term process and require a commitment to prescribe burning on a regular basis. Overall the site contains moderate timber values for existing merchantable slash pine stands. As a result, there should be no problem in soliciting N. Florida market value timber sales as long as they are properly planned and implemented. Proper timber management of these stands will provide revenues that can be used for other management activities that hat included the Conceptual Management Plan for this property.

# Florida State Parks Timber Management Analysis

## Special Management Considerations

### Timber Management Analysis

Chapters 253 and 259, Florida Statutes, require land management plans for parcels greater than 1,000 acres to contain an analysis of the multiple-use potential of the parcel, and the feasibility of the parcel to generate revenues to enhance the management of the parcel, unless the lead agency determines that timber resource management is in conflict with the primary management objectives of the parcel. 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 per the Florida Natural Areas Inventory. The feasibility of managing/harvesting timber at Little Talbot Island State Park (Little Talbot) during the period covered by this Unit Management Plan (UMP) was considered in the context of the DRP's statutory responsibilities and an analysis of the park's resource needs and values. Little Talbot is located in Duval County and 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 utilized by other forest landowners implementing multiple-use management. DRP has contracted with a private sector, professional forest management firm to complete this timber assessment: F4 Tech.

Little Talbot comprises 1,531 acres partitioned into eight (8) management zones. According to management zone and natural community (NatCom) boundary GIS data provided by DRP in April 2019 and assessments of publicly-available aerial imagery, the only forested, upland potential candidate NatCom type for revenue generation and parcel enhancement through timber management is maritime hammock (318 acres). Maritime hammock stands at Little Talbot occur within three management zones: LT-01 (195 acres), LT-02 (105 acres), and LT-05 (18 acres). There will likely be no scheduled timber management activities in historically hardwood-dominated NatCom types such as maritime hammock or wetland NatCom types at Little Talbot. In some circumstances, timber management may include the harvesting and removal of overstory invasive/exotic trees. Please note that any NatCom acreage changes and NatCom treatments occurring after April 2019 are not reflected in this analysis.

With the exception of a few small areas of overstory pines that are scattered throughout the three subject management zones, this is predominantly a hardwood-dominated NatCom type, which DRP does not manage for timber resources. The long-term goal for the subject stands, which are likely late-successional in-terms of development stage, is to allow continued development without intervention. DRP staff have also indicated that maritime hammock areas within these management zones are at or near their desired future condition and standard silvicultural operations are not aligned with NatCom and park long-term management goals. Based on this information, it was concluded that timber management and attendant actions are not needed nor viable for restoring and maintaining forested natural communities at Little Talbot.

During the period of this UMP, active management of all forested NatCom's could be necessary and appropriate in the wake of natural disturbances such as hurricanes, droughts, insect/disease infestations, and invasive/exotic species outbreaks should such events pose a significant threat to forest resources and ecosystem conditions on the island.



## **Timber Management Analysis**

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### **Manatee Springs State Park Forest Resource Assessment**

**Prepared by: Doug Longshore, Senior Forester, Florida Forest Service August 2013**

At the request of Anne Barkdoll, Biologist, Division of Recreation and Parks, a forest resource assessment was prepared for five zones within the Manatee Springs State Park. A field visit was made on August 22, 2013.

#### **Zones MS-5A and MS-5B**

This is a stand of 38-year-old planted slash pine that has been third row select thinned in past years. The stand was mechanically site prepared prior to planting based upon the old windrows found throughout the stand. These windrows are now supporting various upland hardwoods of merchantable size. The stand has been prescribe burned in past years.

Further thinning of the slash pine is not recommended at this time. The tree crowns are open and not overcrowded while still providing adequate fuel for prescribe fires. When the decision is made to begin longleaf restoration within this stand, I would recommend delineating five to ten-acre, irregularly shaped areas, randomly spaced within this stand. These areas would be clearcut of pine and hardwood. Windrows extending into these areas could be rehabbed at this time. These areas would be chemically site prepared and planted to longleaf pine. Over time, as additional areas were added to this restoration effort, a mosaic of varying ages and densities of longleaf pine would be created.

#### **Zone MS-5D**

This stand is a mixture of scrubby hardwood and scattered slash pine. There are isolated areas within this stand where the slash pine is the dominant species in the overstory. Since these areas of pine are relatively small, it is suggested combining any forest management work such as thinning, with scheduled work that may take place in zones MS-5B.

#### **Zone 3C & 3E**

These stands are comprised primarily of mature slash, longleaf pine and upland hardwood. Much like ZoneMS-5D, the pine is concentrated in small patches and quite scattered in the remaining areas. These areas have been prescribe burned in past years. Positive results of the burning can be observed in these areas where the pine component provides adequate fuel for hardwood control. Continue prescribe burning these areas with the intent of gradually pushing back the hardwood edge of these "pine patches". Over time, these areas may provide relatively competition free areas suitable for natural regeneration or possibly hand planting of longleaf pine.

## Timber Management Analysis

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### O'Leno State Park/River Rise Preserve State Park

Forest Resource Assessment

Prepared by: Doug Longshore, Senior Forester, Florida Forest Service August, 2013

At the request of Anne Barkdoll, Biologist, Division of Recreation and Parks, a forest resource assessment was prepared for six zones of the O'Leno State Park/River Rise Preserve. A field visit was made on August 14, 2013.

#### **Zone 3Cs**

Several zones with similar characteristics were viewed during our visit to this property, stand 3Cs being one of them. These stands were comprised primarily of an upland hardwood component with the occasional longleaf pine. Restoration of these stands will require removal of the undesirable hardwoods, a chemical application (mechanical or hand application) to control hardwood sprouting, and planting of longleaf pine. The restoration of these stands is certainly possible. This will be an expensive, long term process requiring patience, flexibility, and commitment of all involved in order for it to be successful.

Removal of the undesirable hardwood component can be accomplished in one of two ways:

1) The hardwood trees can be treated with an approved herbicide, left in place to die, gradually breaking down and decomposing over time. This would involve the individual stem treatment of the smaller, undesirable hardwoods. Over time, this would allow more sunlight to reach the ground, promoting the growth of groundcover species now being shaded out by overstory hardwoods and leaf litter. In addition, it would create small openings where longleaf could be planted. As these stands continued to be prescribe burned, these smaller hardwoods would gradually be consumed by the periodic fires. Over time, some of the larger undesirable hardwoods may succumb to the periodic prescribe burns. Remaining larger hardwood trees could gradually be removed through individual stem treatment with an approved herbicide.

2) The hardwood can be sold. In addition to the traditional hardwood markets of the past such as hardwood pulpwood and hardwood logs, there is an additional fuelwood market that utilizes much of the logging debris left from the conventional logging operation in addition to the smaller, non-merchantable material that was not utilized. Much of this undesirable non-merchantable material of the past can now be utilized as fuel chips. The chipping operation leaves the site relatively free of the unsightly logging slash typically found on conventional logging sites. This type of logging operation is highly mechanized, requiring adequate access for logging equipment and trucks. This operation may involve smaller harvest areas spaced out over a longer time period instead of one sizeable clearcut. Present roads would need to be widened for truck access. Following the logging operation, a chemical application would be required to control hardwood sprouting.

## **Timber Management Analysis**

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### **Zone 2CE**

Former bahiagrass pasture now supporting a natural, fully stocked, merchantable stand of loblolly pine.

Clearcut loblolly pine. Approximately one year following the completion of harvest, establish firelines and prescribe burn this stand. For removal of bahiagrass, spray the area with recommended herbicide at the appropriate time using recommended rates. In winter, following the herbicide application, plant longleaf seedlings.

### **Zone 1N, 1QW**

Mature natural Loblolly pine with open understory of mixed hardwoods. Much of this zone is burned on a regular basis, maintaining a relatively open, park-like appearance for visitors.

This zone runs along the main entrance drive into the park. Harvesting of large, mature timber such as this is difficult to accomplish in a “delicate” manner and will most certainly take away from the aesthetic appeal of this entrance drive. Following the harvest, there will be a flush of hardwood sprouting as demonstrated in past salvaging of bug spots in this area, resulting in the loss of the open park like look.

As a resource manager, I have to give precedence to the present aesthetic qualities of this area over restoration efforts. I would not recommend any harvesting activities along the entrance drive.

### **Zone 1J North**

This area of upland hardwood would require similar treatment options presented for stand 3Cs. Should the decision be made to harvest this area, it is too small to work as a stand-alone project for the typical logging operation unless combined with another project with similar characteristics and objectives such as Zone 1M.

### **Zone 1M**

Mature mixed pine (longleaf, slash, and loblolly pine) with understory of mixed upland hardwoods. There is unimproved access to this area. Harvest loblolly pine and a portion of slash pine, leaving longleaf pine. Harvest undesirable hardwood through conventional harvesting methods or possibly in combination with a chipping operation. This may be the better alternative as the site would be left relatively free of logging slash. Approximately one year from the completion of the harvesting operation, assess the site for prescribe burning and individual stem/foilage treatment of hardwood sprouting. Once undesirable hardwoods are adequately controlled, begin planting longleaf pine in larger openings.

## **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.

Paynes Prairie Preserve State Park (Paynes Prairie) 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 Paynes Prairie during the period covered by the Unit Management Plan (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 reference site descriptions 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 Paynes Prairie had overstory pine stocking levels generally below the ranges 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.

**Addendum \_\_\_\_\_**  
**Timber Management Analysis**

**1. Management Context and Best Management Practices**

Timber management at Paynes Prairie Preserve State Park (Paynes Prairie) is based on the desired future condition (DFC) of a management zone or natural community (NatCom) as determined by the DRP Unit Management Plans (UMP), 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 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 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 fires, windstorms, insects, 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-strikes 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 a buffer zone might have to be removed to prevent significant damage.

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

Paynes Prairie comprises 21,562 acres in Alachua County. A total of 2,300 acres are associated with six (6) upland NatCom types that are potential candidates for timber management. From March to June 2016, an inventory based on field plots was conducted across and within these areas to quantify overstory, midstory and understory conditions. Tree data captured in the 2016 inventory was grown-to- current (circa 2022) for this timber assessment using an industry-standard growth and yield model developed and maintained by the U.S. Forest Service (Forest Vegetation Simulator). 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 June 2022. 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 Paynes Prairie, 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 June 2022 period may not be reflected in the following tables.

**Table 1. General summary statistics for Paynes Prairie.**

Number of Management Zones within the Park	92
Upland NatCom acres	5,681

**Mesic Flatwoods (1,130.8 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 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 Paynes Prairie 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 <sup>2</sup> /ac)	Pine TPA	Pine Volume (tons/ac)	Non-Pine BA (ft <sup>2</sup> /ac)	Non-Pine TPA	Non-Pine Volume (tons/ac)	Total Pine and Non-Pine Volume (tons/ac)	FNAI Reference Condition Pine BA Range (ft <sup>2</sup> /ac)	FNAI Reference Condition Non-Pine TPA Range
PP-14	32.6	36.5	32.1	31.8	5.9	27.6	3.3	35.1	10 - 50	0 - 0
PP-15	28.4	48.3	111.3	30.8	3.4	26.5	0.9	31.8	10 - 50	0 - 0
PP-16	18.0	49.8	27.7	46.9	49.2	240.6	22.5	69.4	10 - 50	0 - 0
PP-17	11.9	53.6	66.4	45.4	12.3	9.7	11.0	56.3	10 - 50	0 - 0
PP-19	17.6	65.0	152.9	46.8	8.4	5.5	3.2	50.0	10 - 50	0 - 0
PP-20	36.7	29.3	15.2	27.5	54.2	117.2	26.9	54.4	10 - 50	0 - 0
PP-21	30.9	70.6	55.3	67.9	18.5	52.2	12.4	80.3	10 - 50	0 - 0
PP-23	82.9	61.8	75.3	55.0	16.2	50.1	5.9	60.9	10 - 50	0 - 0
PP-24	88.8	81.8	80.7	74.7	32.9	72.6	11.6	86.4	10 - 50	0 - 0
PP-25	48.5	58.1	225.9	37.0	8.4	24.7	0.0	37.0	10 - 50	0 - 0
PP-26	34.6	37.0	19.0	38.0	51.5	132.3	23.9	61.9	10 - 50	0 - 0
PP-35	22.7	5.0	0.7	0.0	131.6	223.3	72.3	72.3	10 - 50	0 - 0
PP-36	4.9	--	--	--	--	--	--	--	--	--
PP-37	15.7	24.2	7.5	17.6	87.1	249.4	54.7	72.3	10 - 50	0 - 0
PP-38	12.2	40.5	23.2	41.1	44.1	85.5	34.1	75.2	10 - 50	0 - 0
PP-40	21.1	10.9	4.4	13.1	96.7	181.9	76.7	89.8	10 - 50	0 - 0
PP-201	45.4	4.0	2.0	3.5	92.9	192.0	62.5	65.9	10 - 50	0 - 0
PP-1202	76.1	20.4	31.5	18.0	73.3	99.5	38.7	56.7	10 - 50	0 - 0
PP-1301	43.7	71.1	174.1	50.1	69.8	165.7	9.3	59.4	10 - 50	0 - 0
PP-1302	15.9	50.5	30.0	50.6	88.9	159.9	71.7	122.3	10 - 50	0 - 0
PP-1307	36.6	0.0	0.0	0.0	63.4	109.9	37.0	37.0	10 - 50	0 - 0
PP-1308	16.9	55.0	24.6	54.7	38.3	56.8	17.1	71.8	10 - 50	0 - 0
PP-1401	19.7	0.0	0.0	0.0	103.3	184.2	74.5	74.5	10 - 50	0 - 0
PP-1402	17.0	0.0	0.0	0.0	120.5	152.1	32.2	32.2	10 - 50	0 - 0
PP-1501	2.1	--	--	--	--	--	--	--	--	--
PP-1502	5.3	--	--	--	--	--	--	--	--	--
PP-1503	12.4	20.8	22.0	19.3	41.2	120.9	27.5	46.9	10 - 50	0 - 0
PP-1601	16.8	2.8	11.7	0.0	24.8	89.2	13.2	13.2	10 - 50	0 - 0

MZ ID	Mesic Flatwoods (Acres)	Current Average Overstory Conditions							Target Overstory Conditions	
		Pine BA (ft <sup>2</sup> /ac)	Pine TPA	Pine Volume (tons/ac)	Non-Pine BA (ft <sup>2</sup> /ac)	Non-Pine TPA	Non-Pine Volume (tons/ac)	Total Pine and Non-Pine Volume (tons/ac)	FNAI Reference Condition Pine BA Range (ft <sup>2</sup> /ac)	FNAI Reference Condition Non-Pine TPA Range
PP-1602	8.4	18.4	110.1	5.2	49.7	175.6	28.0	33.2	10 - 50	0 - 0
PP-1603	58.6	0.0	0.0	0.0	90.0	243.9	48.1	48.1	10 - 50	0 - 0
PP-1604	2.4	10.7	5.2	6.0	90.7	172.3	28.9	34.9	10 - 50	0 - 0
PP-1701	33.6	29.9	16.4	31.0	69.5	145.1	19.9	50.9	10 - 50	0 - 0
PP-1702	56.7	15.5	48.2	7.6	4.4	28.9	1.0	8.6	10 - 50	0 - 0
PP-1703	126.2	8.9	23.6	5.3	20.0	98.7	6.9	12.2	10 - 50	0 - 0
PP-1801	0.4	--	--	--	--	--	--	--	--	--
PP-2001	1.3	--	--	--	--	--	--	--	--	--
PP-2101	1.4	--	--	--	--	--	--	--	--	--
PP-2401	2.3	39.5	21.6	44.3	40.7	36.9	42.9	87.1	10 - 50	0 - 0
PP-2501	24.7	31.6	38.2	28.7	34.4	181.0	17.6	46.4	10 - 50	0 - 0
<b>Total</b>	<b>1,130.8</b>									

**Sandhill (74.6 acres)**

Longleaf pine (*Pinus palustris*) is the preferred overstory pine species in the region. The FNAI reference site in this region for sandhill contains longleaf pine at a basal area (BA) of 20 to 60 square feet per acre with non-pine at a density of 0 to 79 trees per acre (TPA). The following table shows the overstory condition for this natural community at Paynes Prairie and target overstory condition for sandhill in this region.

MZ ID	Sandhill (Acres)	Current Average Overstory Conditions							Target Overstory Conditions	
		Pine BA (ft <sup>2</sup> /ac)	Pine TPA	Pine Volume (tons/ac)	Non-Pine BA (ft <sup>2</sup> /ac)	Non-Pine TPA	Non-Pine Volume (tons/ac)	Total Pine and Non-Pine Volume (tons/ac)	FNAI Reference Condition Pine BA Range (ft <sup>2</sup> /ac)	FNAI Reference Condition Non-Pine TPA Range
PP-15	4.3	20.4	12.2	18.5	48.9	79.1	13.1	31.5	20 - 60	0 - 79
PP-19	2.9	0.0	0.0	0.0	149.0	231.3	31.8	31.8	20 - 60	0 - 79
PP-20	17.3	14.9	4.6	17.0	76.2	27.0	48.7	65.7	20 - 60	0 - 79
PP-27	1.6	--	--	--	--	--	--	--	--	--
PP-28	4.8	130.2	79.1	137.6	0.0	0.0	0.0	137.6	20 - 60	0 - 79
PP-1402	4.4	0.0	0.0	0.0	85.4	133.4	0.0	0.0	20 - 60	0 - 79
PP-1502	13.0	8.9	4.0	8.6	91.4	123.9	42.1	50.7	20 - 60	0 - 79
PP-1601	25.4	19.7	42.4	11.7	0.0	0.0	0.0	11.7	20 - 60	0 - 79



MZ ID	Sandhill (Acres)	Current Average Overstory Conditions							Target Overstory Conditions	
		Pine BA (ft <sup>2</sup> /ac)	Pine TPA	Pine Volume (tons/ac)	Non-Pine BA (ft <sup>2</sup> /ac)	Non-Pine TPA	Non-Pine Volume (tons/ac)	Total Pine and Non-Pine Volume (tons/ac)	FNAI Reference Condition Pine BA Range (ft <sup>2</sup> /ac)	FNAI Reference Condition Non-Pine TPA Range
PP-2101	1.0	--	--	--	--	--	--	--	--	--
<b>Total</b>	<b>74.6</b>									

**Scrubby Flatwoods (160.1 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 20 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 Paynes Prairie and target overstory condition for scrubby flatwoods in this region.

MZ ID	Scrubby Flatwoods (Acres)	Current Average Overstory Conditions							Target Overstory Conditions	
		Pine BA (ft <sup>2</sup> /ac)	Pine TPA	Pine Volume (tons/ac)	Non-Pine BA (ft <sup>2</sup> /ac)	Non-Pine TPA	Non-Pine Volume (tons/ac)	Total Pine and Non-Pine Volume (tons/ac)	FNAI Reference Condition Pine BA Range (ft <sup>2</sup> /ac)	FNAI Reference Condition Non-Pine TPA Range
PP-26	11.8	12.9	36.6	7.6	12.8	84.1	0.0	7.6	20 - 60	0 - 26
PP-804	2.5	--	--	--	--	--	--	--	--	--
PP-1306	5.0	0.0	0.0	0.0	62.8	332.6	0.0	0.0	20 - 60	0 - 26
PP-1307	94.6	6.4	11.3	4.8	74.6	316.5	16.2	20.9	20 - 60	0 - 26
PP-1308	9.2	27.6	32.2	25.7	67.3	377.2	0.0	25.7	20 - 60	0 - 26
PP-1310	0.3	--	--	--	--	--	--	--	--	--
PP-1602	3.1	10.0	3.4	13.3	157.6	561.5	85.6	98.9	20 - 60	0 - 26
PP-1603	3.1	0.0	0.0	0.0	87.0	289.8	57.9	57.9	20 - 60	0 - 26
PP-1703	29.7	2.9	0.8	2.4	77.8	245.2	23.5	26.0	20 - 60	0 - 26
PP-2501	0.8	--	--	--	--	--	--	--	--	--
<b>Total</b>	<b>160.1</b>									

**Upland Mixed Woodland (275.3 acres)**

Longleaf pine (*Pinus palustris*) and southern red oak (*Quercus falcata*) are the preferred overstory species in the region. The FNAI reference site in this region for upland mixed woodland contains longleaf pine at a basal area (BA) of 10 to 30 square feet per acre with non-pine at a density of 26 to 132 trees per acre (TPA). The following table shows the overstory condition for this natural community at Paynes Prairie and target overstory condition for upland mixed woodland in this region.

MZ ID	Upland Mixed Woodland (Acres)	Current Average Overstory Conditions							Target Overstory Conditions	
		Pine BA (ft <sup>2</sup> /ac)	Pine TPA	Pine Volume (tons/ac)	Non-Pine BA (ft <sup>2</sup> /ac)	Non-Pine TPA	Non-Pine Volume (tons/ac)	Total Pine and Non-Pine Volume (tons/ac)	FNAI Reference Condition Pine BA Range (ft <sup>2</sup> /ac)	FNAI Reference Condition Non-Pine TPA Range
PP-801	33.0	69.1	158.8	48.4	43.8	82.3	24.3	72.7	10 - 30	26 - 132
PP-802	17.1	5.6	1.5	5.1	87.2	84.5	52.9	58.0	10 - 30	26 - 132
PP-804	6.4	0.0	0.0	0.0	123.9	69.2	87.3	87.3	10 - 30	26 - 132
PP-805	166.6	2.6	0.6	2.8	80.6	88.3	58.5	61.3	10 - 30	26 - 132
PP-806	0.4	--	--	--	--	--	--	--	--	--
PP-1103	27.2	0.0	0.0	0.0	70.8	215.8	28.3	28.3	10 - 30	26 - 132
PP-1104	24.6	3.1	3.6	2.2	71.6	71.1	55.4	57.6	10 - 30	26 - 132
<b>Total</b>	<b>275.3</b>									

**Upland Pine (555.0 acres)**

Longleaf pine (*Pinus palustris*) is the preferred overstory pine species in the region. The FNAI reference site in this region for upland pine contains longleaf pine at a basal area (BA) of 30 to 80 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 Paynes Prairie and target overstory condition for upland pine in this region.

MZ ID	Upland Pine (Acres)	Current Average Overstory Conditions							Target Overstory Conditions	
		Pine BA (ft <sup>2</sup> /ac)	Pine TPA	Pine Volume (tons/ac)	Non-Pine BA (ft <sup>2</sup> /ac)	Non-Pine TPA	Non-Pine Volume (tons/ac)	Total Pine and Non-Pine Volume (tons/ac)	FNAI Reference Condition Pine BA Range (ft <sup>2</sup> /ac)	FNAI Reference Condition Non-Pine TPA Range
PP-18	3.3	--	--	--	--	--	--	--	--	--
PP-19	6.6	9.8	5.2	10.0	78.9	105.0	74.7	84.8	30 - 80	0 - 26
PP-20	4.9	--	--	--	--	--	--	--	--	--
PP-26	17.4	5.2	3.4	5.4	76.5	168.7	51.5	56.8	30 - 80	0 - 26
PP-27	37.3	33.8	35.9	32.0	75.6	88.9	26.7	58.7	30 - 80	0 - 26
PP-28	11.8	11.0	3.5	13.3	97.0	152.8	54.6	67.9	30 - 80	0 - 26
PP-29	5.7	--	--	--	--	--	--	--	--	--
PP-30	41.1	7.1	3.1	7.7	119.0	167.8	35.8	43.5	30 - 80	0 - 26
PP-31	84.5	0.0	0.0	0.0	96.6	107.3	45.7	45.7	30 - 80	0 - 26
PP-33	33.6	0.0	0.0	0.0	92.9	125.6	32.7	32.7	30 - 80	0 - 26
PP-34	32.5	0.0	0.0	0.0	96.8	64.0	15.8	15.8	30 - 80	0 - 26
PP-35	23.3	2.9	0.9	2.5	96.2	74.1	64.4	66.9	30 - 80	0 - 26
PP-806	8.9	18.1	11.1	18.8	92.8	69.3	18.6	37.5	30 - 80	0 - 26

MZ ID	Upland Pine (Acres)	Current Average Overstory Conditions							Target Overstory Conditions	
		Pine BA (ft <sup>2</sup> /ac)	Pine TPA	Pine Volume (tons/ac)	Non-Pine BA (ft <sup>2</sup> /ac)	Non-Pine TPA	Non-Pine Volume (tons/ac)	Total Pine and Non-Pine Volume (tons/ac)	FNAI Reference Condition Pine BA Range (ft <sup>2</sup> /ac)	FNAI Reference Condition Non-Pine TPA Range
PP-1104	21.3	3.3	2.6	2.7	78.9	61.3	41.0	43.7	30 - 80	0 - 26
PP-1105	4.1	0.0	0.0	0.0	51.3	70.3	46.5	46.5	30 - 80	0 - 26
PP-1301	16.0	0.0	0.0	0.0	72.8	14.0	23.9	23.9	30 - 80	0 - 26
PP-1307	2.5	51.9	23.3	57.5	51.1	108.5	50.5	108.0	30 - 80	0 - 26
PP-1308	43.4	0.0	0.0	0.0	88.0	122.1	66.8	66.8	30 - 80	0 - 26
PP-1309	9.2	43.0	34.6	45.3	62.1	117.6	27.0	72.2	30 - 80	0 - 26
PP-1401	0.1	--	--	--	--	--	--	--	--	--
PP-1402	27.2	20.0	10.1	20.9	117.4	245.9	70.4	91.4	30 - 80	0 - 26
PP-1501	0.1	--	--	--	--	--	--	--	--	--
PP-1502	10.1	0.0	0.0	0.0	86.3	93.9	47.2	47.2	30 - 80	0 - 26
PP-1603	16.2	25.6	10.0	24.7	81.4	156.4	40.0	64.7	30 - 80	0 - 26
PP-1604	3.7	0.0	0.0	0.0	87.6	81.7	77.3	77.3	30 - 80	0 - 26
PP-1703	62.5	1.7	0.6	2.0	103.4	232.5	68.0	69.9	30 - 80	0 - 26
PP-1801	2.7	--	--	--	--	--	--	--	--	--
PP-2101	17.4	0.0	0.0	0.0	113.1	144.0	91.2	91.2	30 - 80	0 - 26
PP-2401	7.8	0.0	0.0	0.0	134.1	291.0	51.6	51.6	30 - 80	0 - 26
<b>Total</b>	<b>555.0</b>									

**Wet Flatwoods (103.9 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 Paynes Prairie and target overstory condition for wet flatwoods in this region.

MZ ID	Wet Flatwoods (Acres)	Current Average Overstory Conditions							Target Overstory Conditions	
		Pine BA (ft <sup>2</sup> /ac)	Pine TPA	Pine Volume (tons/ac)	Non-Pine BA (ft <sup>2</sup> /ac)	Non-Pine TPA	Non-Pine Volume (tons/ac)	Total Pine and Non-Pine Volume (tons/ac)	FNAI Reference Condition Pine BA Range (ft <sup>2</sup> /ac)	FNAI Reference Condition Non-Pine TPA Range
PP-14	5.9	74.7	104.3	51.4	0.0	0.0	0.0	51.4	10 - 50	0 - 0
PP-15	10.2	11.8	38.9	6.6	0.0	0.0	0.0	6.6	10 - 50	0 - 0
PP-18	31.5	55.1	109.1	39.2	13.5	53.9	7.5	46.7	10 - 50	0 - 0

MZ ID	Wet Flatwoods (Acres)	Current Average Overstory Conditions							Target Overstory Conditions	
		Pine BA (ft <sup>2</sup> /ac)	Pine TPA	Pine Volume (tons/ac)	Non-Pine BA (ft <sup>2</sup> /ac)	Non-Pine TPA	Non-Pine Volume (tons/ac)	Total Pine and Non-Pine Volume (tons/ac)	FNAI Reference Condition Pine BA Range (ft <sup>2</sup> /ac)	FNAI Reference Condition Non-Pine TPA Range
PP-22	17.6	34.8	70.0	23.4	12.4	8.8	12.3	35.7	10 - 50	0 - 0
PP-1402	0.4	--	--	--	--	--	--	--	--	--
PP-1702	3.3	0.0	0.0	0.0	128.1	692.9	56.3	56.3	10 - 50	0 - 0
PP-1703	31.8	29.9	44.2	22.9	40.2	54.3	12.3	35.2	10 - 50	0 - 0
PP-1801	2.2	--	--	--	--	--	--	--	--	--
PP-2501	1.1	--	--	--	--	--	--	--	--	--
<b>Total</b>	<b>103.9</b>									

## **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.

Price's Scrub State Park (Price's Scrub) 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 Price's Scrub during the period covered by the Unit Management Plan (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 reference site descriptions 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 Price's Scrub had pine and non-pine (hardwood) overstory stocking levels generally within the ranges 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.

**Addendum \_\_\_\_\_**  
**Timber Management Analysis**

**1. Management Context and Best Management Practices**

Timber management at Price's Scrub State Park (Price's Scrub) is based on the desired future condition (DFC) of a management zone or natural community (NatCom) as determined by the DRP Unit Management Plan (UMP), 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 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 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 fires, windstorms, insects, 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-strikes 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 a buffer zone might have to be removed to prevent significant damage.

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

Price’s Scrub comprises 962 acres in Marion County. A total of 474 acres are associated with five (5) upland NatCom types that are potential candidates for timber management. In October 2017, an inventory based on field plots was conducted across and within these areas to quantify overstory, midstory and understory conditions. Tree data captured in the 2017 inventory was grown-to-current (circa 2022) for this timber assessment using an industry-standard growth and yield model developed and maintained by the U.S. Forest Service (Forest Vegetation Simulator). 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 June 2022. 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 Price’s Scrub, 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 June 2022 period may not be reflected in the following tables.

**Table 1. General summary statistics for Price’s Scrub.**

Number of Management Zones within the Park	10
Upland NatCom acres	802

**Mesic Flatwoods (162.2 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 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 Price’s Scrub 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 <sup>2</sup> /ac)	Pine TPA	Pine Volume (tons/ac)	Non-Pine BA (ft <sup>2</sup> /ac)	Non-Pine TPA	Non-Pine Volume (tons/ac)	Total Pine and Non-Pine Volume (tons/ac)	FNAI Reference Condition Pine BA Range (ft <sup>2</sup> /ac)	FNAI Reference Condition Non-Pine TPA Range
PRS-2A	30.5	27.1	45.0	18.0	4.1	11.0	1.8	19.8	10 - 50	0 - 0
PRS-2B	15.0	27.4	94.2	16.1	21.2	16.7	14.2	30.2	10 - 50	0 - 0
PRS-2C	14.0	20.2	30.6	13.8	0.0	0.0	0.0	13.8	10 - 50	0 - 0
PRS-2D	28.4	36.0	66.6	23.3	11.9	18.3	0.0	23.3	10 - 50	0 - 0
PRS-3	69.1	36.9	65.7	25.6	26.3	113.5	9.7	35.3	10 - 50	0 - 0
PRS-3A	5.2	--	--	--	--	--	--	--	--	--
<b>Total</b>	<b>162.2</b>									

### Scrub (37.0 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 13 trees per acre (TPA). The following table shows the overstory condition for this natural community at Price's Scrub and target overstory condition for scrub in this region.

MZ ID	Scrub (Acres)	Current Average Overstory Conditions							Target Overstory Conditions	
		Pine BA (ft <sup>2</sup> /ac)	Pine TPA	Pine Volume (tons/ac)	Non-Pine BA (ft <sup>2</sup> /ac)	Non-Pine TPA	Non-Pine Volume (tons/ac)	Total Pine and Non-Pine Volume (tons/ac)	FNAI Reference Condition Pine BA Range (ft <sup>2</sup> /ac)	FNAI Reference Condition Non-Pine TPA Range
PRS-2A	7.5	--	--	--	--	--	--	--	--	--
PRS-2B	6.7	13.3	23.2	8.6	0.0	0.0	0.0	8.6	0 - 20	0 - 13
PRS-2C	0.2	--	--	--	--	--	--	--	--	--
PRS-2D	1.0	--	--	--	--	--	--	--	--	--
PRS-3	0.2	--	--	--	--	--	--	--	--	--
PRS-3A	21.4	7.2	13.5	3.3	0.0	0.0	0.0	3.3	0 - 20	0 - 13
<b>Total</b>	<b>37.0</b>									

### Scrubby Flatwoods (190.9 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 Price’s Scrub and target overstory condition for scrubby flatwoods in this region.

MZ ID	Scrubby Flatwoods (Acres)	Current Average Overstory Conditions							Target Overstory Conditions	
		Pine BA (ft <sup>2</sup> /ac)	Pine TPA	Pine Volume (tons/ac)	Non-Pine BA (ft <sup>2</sup> /ac)	Non-Pine TPA	Non-Pine Volume (tons/ac)	Total Pine and Non-Pine Volume (tons/ac)	FNAI Reference Condition Pine BA Range (ft <sup>2</sup> /ac)	FNAI Reference Condition Non-Pine TPA Range
PRS-2A	30.4	37.5	175.4	18.4	8.3	32.3	0.0	18.4	10 - 60	0 - 26
PRS-2B	62.5	11.0	42.6	6.0	17.2	28.3	5.4	11.4	10 - 60	0 - 26
PRS-2C	8.8	2.9	3.0	1.8	0.0	0.0	0.0	1.8	10 - 60	0 - 26
PRS-2D	5.8	21.8	37.8	6.2	0.0	0.0	0.0	6.2	10 - 60	0 - 26
PRS-3	65.5	9.5	9.8	6.9	11.5	18.1	1.4	8.2	10 - 60	0 - 26
PRS-3A	18.0	34.1	53.3	15.0	0.0	0.0	0.0	15.0	10 - 60	0 - 26
<b>Total</b>	<b>190.9</b>									

**Upland Mixed Woodland (75.0 acres)**

Longleaf pine (*Pinus palustris*) and southern red oak (*Quercus falcata*) are the preferred overstory species in the region. The FNAI reference site in this region for upland mixed woodland contains longleaf pine at a basal area (BA) of 10 to 30 square feet per acre with non-pine at a density of 26 to 132 trees per acre (TPA). The following table shows the overstory condition for this natural community at Price’s Scrub and target overstory condition for upland mixed woodland in this region.

MZ ID	Upland Mixed Woodland (Acres)	Current Average Overstory Conditions							Target Overstory Conditions	
		Pine BA (ft <sup>2</sup> /ac)	Pine TPA	Pine Volume (tons/ac)	Non-Pine BA (ft <sup>2</sup> /ac)	Non-Pine TPA	Non-Pine Volume (tons/ac)	Total Pine and Non-Pine Volume (tons/ac)	FNAI Reference Condition Pine BA Range (ft <sup>2</sup> /ac)	FNAI Reference Condition Non-Pine TPA Range
PRS-1A	3.9	0.0	0.0	0.0	81.1	63.6	80.6	80.6	10 - 30	26 - 132
PRS-1B	3.5	14.4	13.5	14.6	82.7	79.4	29.4	44.0	10 - 30	26 - 132
PRS-1C	41.7	0.0	0.0	0.0	62.4	100.6	33.0	33.0	10 - 30	26 - 132
PRS-1D	1.2	--	--	--	--	--	--	--	--	--
PRS-2A	2.1	--	--	--	--	--	--	--	--	--
PRS-2B	12.1	0.0	0.0	0.0	115.6	296.9	33.3	33.3	10 - 30	26 - 132
PRS-3	10.6	0.0	0.0	0.0	82.1	95.3	64.3	64.3	10 - 30	26 - 132
<b>Total</b>	<b>75.0</b>									

**Wet Flatwoods (8.6 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 Price’s Scrub and target overstory condition for wet flatwoods in this region.

MZ ID	Wet Flatwoods (Acres)	Current Average Overstory Conditions							Target Overstory Conditions	
		Pine BA (ft <sup>2</sup> /ac)	Pine TPA	Pine Volume (tons/ac)	Non-Pine BA (ft <sup>2</sup> /ac)	Non-Pine TPA	Non-Pine Volume (tons/ac)	Total Pine and Non-Pine Volume (tons/ac)	FNAI Reference Condition Pine BA Range (ft <sup>2</sup> /ac)	FNAI Reference Condition Non-Pine TPA Range
PRS-2D	8.6	38.1	61.8	26.6	10.8	46.2	3.7	30.3	10 - 50	0 - 0
<b>Total</b>	<b>8.6</b>									

## **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.

Pumpkin Hill Creek Preserve State Park (Pumpkin Hill) 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 Pumpkin Hill during the period covered by the Unit Management Plan (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 reference site descriptions 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 Pumpkin Hill had overstory pine stocking levels generally within the ranges 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.

**Addendum \_\_\_\_\_**  
**Timber Management Analysis**

**1. Management Context and Best Management Practices**

Timber management at Pumpkin Hill Creek Preserve State Park (Pumpkin Hill) is based on the desired future condition (DFC) of a management zone or natural community (NatCom) as determined by the DRP Unit Management Plans (UMP), 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 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 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 fires, windstorms, insects, 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-strikes 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 a buffer zone might have to be removed to prevent significant damage.

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

Pumpkin Hill comprises 4,077 acres in Duval County. A total of 3,269 acres are associated with four (4) upland NatCom types that are potential candidates for timber management. In January and February 2016, an inventory based on field plots was conducted across and within these areas to quantify overstory, midstory and understory conditions. Tree data captured in the 2016 inventory was grown-to-current (circa 2022) for this timber assessment using an industry-standard growth and yield model developed and maintained by the U.S. Forest Service (Forest Vegetation Simulator). 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 June 2022. 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 Pumpkin Hill, 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 June 2022 period may not be reflected in the following tables.

**Table 1. General summary statistics for Pumpkin Hill.**

Number of Management Zones within the Park	114
Upland NatCom acres	3,462

**Mesic Flatwoods (1,981.3 acres)**

Longleaf pine (*Pinus palustris*) and slash pine (*Pinus elliottii*) are the preferred overstory pine species in the region. The FNAI reference site in this region for mesic flatwoods contains longleaf and slash 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 Pumpkin Hill 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 <sup>2</sup> /ac)	Pine TPA	Pine Volume (tons/ac)	Non-Pine BA (ft <sup>2</sup> /ac)	Non-Pine TPA	Non-Pine Volume (tons/ac)	Total Pine and Non-Pine Volume (tons/ac)	FNAI Reference Condition Pine BA Range (ft <sup>2</sup> /ac)	FNAI Reference Condition Non-Pine TPA Range
PH-1A	71.5	38.6	54.8	30.9	3.4	24.9	0.0	30.9	10 - 50	0 - 0
PH-1B	20.7	26.5	25.4	21.5	0.0	0.0	0.0	21.5	10 - 50	0 - 0
PH-1C	10.1	--	--	--	--	--	--	--	--	--
PH-1D	9.4	58.7	39.6	52.6	14.8	8.3	2.1	54.7	10 - 50	0 - 0
PH-1E	31.8	46.3	60.9	36.6	6.6	8.5	4.7	41.3	10 - 50	0 - 0
PH-1F	12.1	22.3	23.8	17.8	0.0	0.0	0.0	17.8	10 - 50	0 - 0
PH-1Ge	1.6	11.2	32.1	0.0	0.0	0.0	0.0	0.0	10 - 50	0 - 0
PH-1Gw	28.7	102.8	573.8	47.9	0.0	0.0	0.0	47.9	10 - 50	0 - 0
PH-1Hn	44.2	55.0	113.0	42.4	20.0	80.3	4.7	47.1	10 - 50	0 - 0
PH-1Hs	39.5	83.7	168.9	57.7	13.9	62.4	5.5	63.1	10 - 50	0 - 0
PH-1Jn	4.0	83.1	142.2	57.2	0.0	0.0	0.0	57.2	10 - 50	0 - 0
PH-1Js	29.7	21.3	37.4	13.1	0.0	0.0	0.0	13.1	10 - 50	0 - 0
PH-1Ke	9.7	20.7	12.9	18.6	20.6	25.0	18.4	36.9	10 - 50	0 - 0
PH-1Kw	7.2	--	--	--	--	--	--	--	--	--
PH-1L	20.0	40.5	58.7	31.2	0.0	0.0	0.0	31.2	10 - 50	0 - 0
PH-1M	27.9	40.6	68.0	29.8	2.9	3.2	2.9	32.7	10 - 50	0 - 0
PH-1Ne	1.7	--	--	--	--	--	--	--	--	--
PH-1Nn	5.5	41.5	277.3	17.0	0.0	0.0	0.0	17.0	10 - 50	0 - 0
PH-1Ns	17.0	20.6	42.8	14.1	0.0	0.0	0.0	14.1	10 - 50	0 - 0
PH-1P	8.8	--	--	--	--	--	--	--	--	--
PH-1Q	12.6	28.8	46.4	20.8	0.0	0.0	0.0	20.8	10 - 50	0 - 0
PH-1R	32.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	10 - 50	0 - 0
PH-1Sn	85.8	34.6	46.1	28.7	0.0	0.0	0.0	28.7	10 - 50	0 - 0
PH-1Ss	2.2	--	--	--	--	--	--	--	--	--
PH-1T	33.1	81.2	100.1	68.4	2.9	8.7	2.0	70.5	10 - 50	0 - 0
PH-1Un	6.9	70.1	154.7	42.4	0.0	0.0	0.0	42.4	10 - 50	0 - 0
PH-1Us	20.6	30.8	19.6	27.7	0.0	0.0	0.0	27.7	10 - 50	0 - 0
PH-1V	10.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	10 - 50	0 - 0

MZ ID	Mesic Flatwoods (Acres)	Current Average Overstory Conditions							Target Overstory Conditions	
		Pine BA (ft <sup>2</sup> /ac)	Pine TPA	Pine Volume (tons/ac)	Non-Pine BA (ft <sup>2</sup> /ac)	Non-Pine TPA	Non-Pine Volume (tons/ac)	Total Pine and Non-Pine Volume (tons/ac)	FNAI Reference Condition Pine BA Range (ft <sup>2</sup> /ac)	FNAI Reference Condition Non-Pine TPA Range
PH-1W	8.9	--	--	--	--	--	--	--	--	--
PH-2Ae	5.5	--	--	--	--	--	--	--	--	--
PH-2As	8.0	55.4	68.2	46.2	13.8	34.5	5.7	51.9	10 - 50	0 - 0
PH-2Aw	27.2	42.2	58.9	32.7	26.1	63.8	2.2	34.9	10 - 50	0 - 0
PH-2B	16.9	74.5	110.2	62.3	11.3	22.7	9.8	72.1	10 - 50	0 - 0
PH-2Cn	4.9	10.5	10.1	9.0	0.0	0.0	0.0	9.0	10 - 50	0 - 0
PH-2Cs	10.9	20.6	47.1	14.6	0.0	0.0	0.0	14.6	10 - 50	0 - 0
PH-2D	2.5	51.8	53.5	42.4	50.1	123.2	22.6	65.0	10 - 50	0 - 0
PH-2Es	14.8	99.6	130.2	82.4	44.7	164.6	21.3	103.7	10 - 50	0 - 0
PH-2Fe	27.9	33.3	42.7	28.8	0.0	0.0	0.0	28.8	10 - 50	0 - 0
PH-2Fw	34.7	61.5	137.3	43.2	0.0	0.0	0.0	43.2	10 - 50	0 - 0
PH-2Ge	95.7	4.3	8.1	2.9	0.0	0.0	0.0	2.9	10 - 50	0 - 0
PH-2Gw	13.5	31.2	58.9	23.3	0.0	0.0	0.0	23.3	10 - 50	0 - 0
PH-2H	42.8	30.9	41.8	23.9	4.2	15.8	2.1	26.0	10 - 50	0 - 0
PH-2J	17.9	31.6	54.0	21.5	2.6	5.2	2.0	23.5	10 - 50	0 - 0
PH-2K	4.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	10 - 50	0 - 0
PH-2Le	3.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	10 - 50	0 - 0
PH-2Ln	2.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	10 - 50	0 - 0
PH-2Ls	1.6	--	--	--	--	--	--	--	--	--
PH-2M	5.5	--	--	--	--	--	--	--	--	--
PH-2N	66.9	63.6	156.4	39.5	8.2	50.2	2.0	41.5	10 - 50	0 - 0
PH-2P	4.6	--	--	--	--	--	--	--	--	--
PH-3A	3.3	0.0	0.0	0.0	50.4	49.2	36.3	36.3	10 - 50	0 - 0
PH-3Cn	14.3	63.0	126.2	45.3	0.0	0.0	0.0	45.3	10 - 50	0 - 0
PH-3Cs	16.0	50.1	120.2	34.1	5.9	34.2	2.8	36.9	10 - 50	0 - 0
PH-3De	7.3	54.5	70.4	46.2	40.3	111.1	29.5	75.7	10 - 50	0 - 0
PH-3Dw	27.7	11.1	11.2	8.8	41.8	172.5	18.5	27.3	10 - 50	0 - 0
PH-4Ae	21.2	10.8	12.5	8.5	0.0	0.0	0.0	8.5	10 - 50	0 - 0
PH-4An	1.5	51.7	28.5	50.7	0.0	0.0	0.0	50.7	10 - 50	0 - 0
PH-4As	8.7	59.2	70.3	48.3	32.9	51.4	31.0	79.2	10 - 50	0 - 0
PH-4Aw	36.8	61.3	87.2	49.1	2.8	3.9	0.0	49.1	10 - 50	0 - 0
PH-4Bc	24.1	20.9	40.1	15.7	0.0	0.0	0.0	15.7	10 - 50	0 - 0
PH-4Be	10.9	40.5	63.1	31.7	7.0	28.9	4.6	36.4	10 - 50	0 - 0
PH-4Bn	30.3	7.6	12.6	5.8	18.2	34.3	14.9	20.7	10 - 50	0 - 0

MZ ID	Mesic Flatwoods (Acres)	Current Average Overstory Conditions							Target Overstory Conditions	
		Pine BA (ft <sup>2</sup> /ac)	Pine TPA	Pine Volume (tons/ac)	Non-Pine BA (ft <sup>2</sup> /ac)	Non-Pine TPA	Non-Pine Volume (tons/ac)	Total Pine and Non-Pine Volume (tons/ac)	FNAI Reference Condition Pine BA Range (ft <sup>2</sup> /ac)	FNAI Reference Condition Non-Pine TPA Range
PH-4Bw	25.6	5.7	9.7	4.4	39.6	67.3	16.0	20.4	10 - 50	0 - 0
PH-4C	10.8	33.4	83.5	21.4	5.2	60.4	0.0	21.4	10 - 50	0 - 0
PH-4Dn	25.2	58.1	80.6	45.0	11.1	29.8	7.1	52.2	10 - 50	0 - 0
PH-4Ds	8.4	11.1	22.4	8.0	0.0	0.0	0.0	8.0	10 - 50	0 - 0
PH-4Dw	3.9	65.0	72.0	55.1	4.8	21.1	2.9	57.9	10 - 50	0 - 0
PH-4E	40.2	59.8	65.1	50.5	24.5	94.2	13.4	63.9	10 - 50	0 - 0
PH-4Fc	62.3	27.3	54.9	20.7	23.8	117.2	7.2	27.9	10 - 50	0 - 0
PH-4Fe	16.0	16.3	33.9	11.7	0.0	0.0	0.0	11.7	10 - 50	0 - 0
PH-4Fn	10.1	62.6	77.7	51.8	31.5	141.9	6.7	58.5	10 - 50	0 - 0
PH-4Fs	2.1	--	--	--	--	--	--	--	--	--
PH-4Fw	20.0	85.8	164.7	65.5	15.3	103.6	4.3	69.8	10 - 50	0 - 0
PH-4G	13.5	19.1	23.6	15.8	27.4	77.2	13.3	29.0	10 - 50	0 - 0
PH-5Be	15.1	43.5	73.3	34.1	10.1	8.1	9.4	43.5	10 - 50	0 - 0
PH-5Bw	27.4	87.9	166.7	68.6	16.3	55.6	10.5	79.1	10 - 50	0 - 0
PH-5Cn	21.0	92.1	102.8	81.7	23.1	31.0	23.0	104.7	10 - 50	0 - 0
PH-5Cs	65.4	64.0	94.3	54.2	13.0	42.7	8.5	62.7	10 - 50	0 - 0
PH-5D	61.9	90.9	118.4	75.1	18.0	59.9	10.7	85.8	10 - 50	0 - 0
PH-5Es	20.0	22.9	34.1	16.9	0.0	0.0	0.0	16.9	10 - 50	0 - 0
PH-5Fe	8.4	84.6	66.6	80.0	35.4	63.5	30.4	110.4	10 - 50	0 - 0
PH-5Fw	15.4	80.2	51.3	78.5	56.5	221.2	38.1	116.6	10 - 50	0 - 0
PH-5G	6.5	--	--	--	--	--	--	--	--	--
PH-5H	23.4	40.4	157.3	27.6	10.2	34.0	7.2	34.9	10 - 50	0 - 0
PH-5Je	11.5	52.3	66.2	41.9	64.0	213.8	38.5	80.4	10 - 50	0 - 0
PH-5Jw	12.1	87.6	83.1	75.7	17.7	75.2	3.4	79.1	10 - 50	0 - 0
PH-5Ke	7.5	69.4	85.3	55.1	0.0	0.0	0.0	55.1	10 - 50	0 - 0
PH-5Kw	6.3	--	--	--	--	--	--	--	--	--
PH-5Ls	12.1	46.7	44.6	37.5	16.3	89.0	4.4	41.9	10 - 50	0 - 0
PH-5Mn	36.5	24.6	38.5	19.3	0.0	0.0	0.0	19.3	10 - 50	0 - 0
PH-5Ms	18.6	73.9	82.6	65.9	4.9	13.8	3.6	69.5	10 - 50	0 - 0
PH-5Ne	2.9	--	--	--	--	--	--	--	--	--
PH-5Ns	5.9	20.3	30.4	15.8	6.8	29.3	2.3	18.1	10 - 50	0 - 0
PH-5Nw	25.0	45.9	64.9	37.3	10.9	47.2	1.7	39.0	10 - 50	0 - 0
PH-5Pc	11.9	40.8	19.8	39.6	30.2	128.7	15.3	55.0	10 - 50	0 - 0
PH-5Pe	6.1	--	--	--	--	--	--	--	--	--



MZ ID	Mesic Flatwoods (Acres)	Current Average Overstory Conditions							Target Overstory Conditions	
		Pine BA (ft <sup>2</sup> /ac)	Pine TPA	Pine Volume (tons/ac)	Non-Pine BA (ft <sup>2</sup> /ac)	Non-Pine TPA	Non-Pine Volume (tons/ac)	Total Pine and Non-Pine Volume (tons/ac)	FNAI Reference Condition Pine BA Range (ft <sup>2</sup> /ac)	FNAI Reference Condition Non-Pine TPA Range
PH-5Pw	8.0	54.8	65.6	46.2	4.5	6.3	3.3	49.5	10 - 50	0 - 0
PH-5Qe	22.5	41.2	48.7	33.7	24.5	47.4	0.0	33.7	10 - 50	0 - 0
PH-5Qw	9.8	87.4	99.8	74.5	2.1	4.6	1.7	76.2	10 - 50	0 - 0
PH-5Rs	1.7	--	--	--	--	--	--	--	--	--
PH-6A	22.6	61.4	75.2	52.0	6.0	19.8	3.9	55.9	10 - 50	0 - 0
PH-6B	20.1	92.3	225.8	65.4	3.3	2.1	0.0	65.4	10 - 50	0 - 0
PH-6C	6.6	21.0	26.4	17.0	17.4	25.5	0.9	17.9	10 - 50	0 - 0
PH-6D	3.8	--	--	--	--	--	--	--	--	--
<b>Total</b>	<b>1,981.3</b>									

**Sandhill (201.5 acres)**

Longleaf pine (*Pinus palustris*) is the preferred overstory pine species in the region. The FNAI reference site in this region for sandhill contains longleaf pine at a basal area (BA) of 20 to 60 square feet per acre with non-pine species between 0 and 79 trees per acre (TPA). The following table shows the overstory condition for this natural community at Pumpkin Hill and target overstory condition for sandhill in this region.

MZ ID	Sandhill (Acres)	Current Average Overstory Conditions							Target Overstory Conditions	
		Pine BA (ft <sup>2</sup> /ac)	Pine TPA	Pine Volume (tons/ac)	Non-Pine BA (ft <sup>2</sup> /ac)	Non-Pine TPA	Non-Pine Volume (tons/ac)	Total Pine and Non-Pine Volume (tons/ac)	FNAI Reference Condition Pine BA Range (ft <sup>2</sup> /ac)	FNAI Reference Condition Non-Pine TPA Range
PH-1F	0.3	--	--	--	--	--	--	--	--	--
PH-1Jn	0.4	--	--	--	--	--	--	--	--	--
PH-1Js	0.5	--	--	--	--	--	--	--	--	--
PH-1Ke	14.7	7.1	6.5	4.7	0.0	0.0	0.0	4.7	20 - 60	0 - 79
PH-1Kw	17.6	0.0	0.0	0.0	55.7	393.7	5.7	5.7	20 - 60	0 - 79
PH-1L	0.4	--	--	--	--	--	--	--	--	--
PH-2Aw	18.5	17.8	32.8	13.6	21.4	52.9	10.8	24.3	20 - 60	0 - 79
PH-2B	4.0	--	--	--	--	--	--	--	--	--
PH-2Cs	6.3	20.1	43.0	13.5	30.1	31.0	0.0	13.5	20 - 60	0 - 79
PH-2D	19.5	31.8	31.4	26.1	26.3	84.6	11.7	37.7	20 - 60	0 - 79

MZ ID	Sandhill (Acres)	Current Average Overstory Conditions							Target Overstory Conditions	
		Pine BA (ft <sup>2</sup> /ac)	Pine TPA	Pine Volume (tons/ac)	Non-Pine BA (ft <sup>2</sup> /ac)	Non-Pine TPA	Non-Pine Volume (tons/ac)	Total Pine and Non-Pine Volume (tons/ac)	FNAI Reference Condition Pine BA Range (ft <sup>2</sup> /ac)	FNAI Reference Condition Non-Pine TPA Range
PH-2En	6.3	35.3	64.6	25.6	54.5	148.0	18.7	44.3	20 - 60	0 - 79
PH-2Es	5.1	20.8	22.0	16.9	71.1	276.5	23.3	40.2	20 - 60	0 - 79
PH-2J	1.1	--	--	--	--	--	--	--	--	--
PH-2Ls	9.7	18.0	18.2	13.8	0.0	0.0	0.0	13.8	20 - 60	0 - 79
PH-2M	9.0	45.7	117.8	32.1	70.1	131.2	11.9	44.0	20 - 60	0 - 79
PH-4Ae	19.4	18.3	20.8	15.7	18.1	119.0	0.0	15.7	20 - 60	0 - 79
PH-4Aw	5.2	60.3	86.7	47.6	16.4	47.8	7.5	55.1	20 - 60	0 - 79
PH-4Bc	8.4	--	--	--	--	--	--	--	--	--
PH-4Be	2.7	48.0	193.9	29.7	0.0	0.0	0.0	29.7	20 - 60	0 - 79
PH-4Bn	6.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	20 - 60	0 - 79
PH-4Bw	8.6	--	--	--	--	--	--	--	--	--
PH-4C	1.4	--	--	--	--	--	--	--	--	--
PH-4Dn	1.9	--	--	--	--	--	--	--	--	--
PH-4E	11.9	16.2	14.6	14.0	72.7	188.5	45.4	59.5	20 - 60	0 - 79
PH-5Kw	22.2	30.1	34.5	24.3	0.0	0.0	0.0	24.3	20 - 60	0 - 79
<b>Total</b>	<b>201.5</b>									

**Scrubby Flatwoods (476.6 acres)**

Longleaf pine (*Pinus palustris*) and slash pine (*Pinus elliottii*) are the preferred overstory pine species in the region. The FNAI reference site in this region for scrubby flatwoods contains longleaf and slash pine at a basal area (BA) of 20 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 Pumpkin Hill and target overstory condition for scrubby flatwoods in this region.

MZ ID	Scrubby Flatwoods (Acres)	Current Average Overstory Conditions							Target Overstory Conditions	
		Pine BA (ft <sup>2</sup> /ac)	Pine TPA	Pine Volume (tons/ac)	Non-Pine BA (ft <sup>2</sup> /ac)	Non-Pine TPA	Non-Pine Volume (tons/ac)	Total Pine and Non-Pine Volume (tons/ac)	FNAI Reference Condition Pine BA Range (ft <sup>2</sup> /ac)	FNAI Reference Condition Non-Pine TPA Range
PH-1A	18.5	10.2	19.2	7.0	10.1	52.9	1.9	8.9	20 - 60	0 - 26
PH-1B	2.4	--	--	--	--	--	--	--	--	--
PH-1C	3.5	--	--	--	--	--	--	--	--	--

MZ ID	Scrubby Flatwoods (Acres)	Current Average Overstory Conditions							Target Overstory Conditions	
		Pine BA (ft <sup>2</sup> /ac)	Pine TPA	Pine Volume (tons/ac)	Non-Pine BA (ft <sup>2</sup> /ac)	Non-Pine TPA	Non-Pine Volume (tons/ac)	Total Pine and Non-Pine Volume (tons/ac)	FNAI Reference Condition Pine BA Range (ft <sup>2</sup> /ac)	FNAI Reference Condition Non-Pine TPA Range
PH-1D	4.4	--	--	--	--	--	--	--	--	--
PH-1F	13.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	20 - 60	0 - 26
PH-1Ge	6.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	20 - 60	0 - 26
PH-1Gw	2.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	20 - 60	0 - 26
PH-1Hn	2.0	--	--	--	--	--	--	--	--	--
PH-1Hs	3.0	--	--	--	--	--	--	--	--	--
PH-1Jn	28.7	3.7	5.4	2.1	0.0	0.0	0.0	2.1	20 - 60	0 - 26
PH-1Js	29.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	20 - 60	0 - 26
PH-1Ke	11.2	52.2	59.5	40.7	0.0	0.0	0.0	40.7	20 - 60	0 - 26
PH-1Kw	7.8	--	--	--	--	--	--	--	--	--
PH-1L	26.2	--	--	--	--	--	--	--	--	--
PH-1M	5.7	--	--	--	--	--	--	--	--	--
PH-1Ne	0.2	--	--	--	--	--	--	--	--	--
PH-1Nn	1.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	20 - 60	0 - 26
PH-1Ns	33.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	20 - 60	0 - 26
PH-1P	11.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	20 - 60	0 - 26
PH-1Q	10.5	--	--	--	--	--	--	--	--	--
PH-1R	12.1	--	--	--	--	--	--	--	--	--
PH-1Sn	2.4	20.9	14.9	19.5	0.0	0.0	0.0	19.5	20 - 60	0 - 26
PH-1Un	8.4	--	--	--	--	--	--	--	--	--
PH-1V	14.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	20 - 60	0 - 26
PH-2Fe	0.2	--	--	--	--	--	--	--	--	--
PH-2Ge	27.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	20 - 60	0 - 26
PH-2H	21.0	9.6	14.2	6.2	0.0	0.0	0.0	6.2	20 - 60	0 - 26
PH-2J	22.5	3.5	3.9	1.9	0.0	0.0	0.0	1.9	20 - 60	0 - 26
PH-2K	5.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	20 - 60	0 - 26
PH-2Le	1.7	--	--	--	--	--	--	--	--	--
PH-2Ln	17.5	9.2	25.5	5.1	0.0	0.0	0.0	5.1	20 - 60	0 - 26
PH-2Ls	6.0	11.7	16.9	7.8	0.0	0.0	0.0	7.8	20 - 60	0 - 26
PH-2N	42.8	18.6	31.7	12.8	1.7	9.3	0.0	12.8	20 - 60	0 - 26
PH-2P	0.7	--	--	--	--	--	--	--	--	--
PH-3B	3.2	--	--	--	--	--	--	--	--	--
PH-3Cn	6.9	--	--	--	--	--	--	--	--	--
PH-3Cs	8.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	20 - 60	0 - 26

MZ ID	Scrubby Flatwoods (Acres)	Current Average Overstory Conditions							Target Overstory Conditions	
		Pine BA (ft <sup>2</sup> /ac)	Pine TPA	Pine Volume (tons/ac)	Non-Pine BA (ft <sup>2</sup> /ac)	Non-Pine TPA	Non-Pine Volume (tons/ac)	Total Pine and Non-Pine Volume (tons/ac)	FNAI Reference Condition Pine BA Range (ft <sup>2</sup> /ac)	FNAI Reference Condition Non-Pine TPA Range
PH-3De	3.7	0.0	0.0	0.0	39.9	36.7	28.7	28.7	20 - 60	0 - 26
PH-3Dw	14.6	0.0	0.0	0.0	70.1	79.4	53.7	53.7	20 - 60	0 - 26
PH-4Ae	1.4	--	--	--	--	--	--	--	--	--
PH-4Bc	4.1	--	--	--	--	--	--	--	--	--
PH-4Be	8.4	21.7	80.9	12.0	11.4	83.7	0.0	12.0	20 - 60	0 - 26
PH-4Bn	1.4	--	--	--	--	--	--	--	--	--
PH-4Bw	5.8	--	--	--	--	--	--	--	--	--
PH-4C	0.8	--	--	--	--	--	--	--	--	--
PH-4Ds	0.6	--	--	--	--	--	--	--	--	--
PH-4Dw	0.6	--	--	--	--	--	--	--	--	--
PH-4Fc	6.5	5.3	17.0	3.5	40.1	196.6	3.2	6.7	20 - 60	0 - 26
PH-4Fe	1.3	--	--	--	--	--	--	--	--	--
PH-4Fw	4.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	20 - 60	0 - 26
<b>Total</b>	<b>476.6</b>									

**Wet Flatwoods (609.2 acres)**

Slash pine (*Pinus elliottii*) is the preferred overstory pine species in the region. The FNAI reference site in this region for wet flatwoods contains slash 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 Pumpkin Hill and target overstory condition for wet flatwoods in this region.

MZ ID	Wet Flatwoods (Acres)	Current Average Overstory Conditions							Target Overstory Conditions	
		Pine BA (ft <sup>2</sup> /ac)	Pine TPA	Pine Volume (tons/ac)	Non-Pine BA (ft <sup>2</sup> /ac)	Non-Pine TPA	Non-Pine Volume (tons/ac)	Total Pine and Non-Pine Volume (tons/ac)	FNAI Reference Condition Pine BA Range (ft <sup>2</sup> /ac)	FNAI Reference Condition Non-Pine TPA Range
PH-1A	25.8	81.5	119.8	64.0	0.0	0.0	0.0	64.0	10 - 50	0 - 0
PH-1D	4.7	--	--	--	--	--	--	--	--	--
PH-1F	1.3	--	--	--	--	--	--	--	--	--
PH-1Ge	4.1	0.0	0.0	0.0	75.6	140.0	46.0	46.0	10 - 50	0 - 0
PH-1Gw	56.7	72.4	77.2	63.3	26.3	95.3	15.5	78.8	10 - 50	0 - 0
PH-1Hn	4.5	--	--	--	--	--	--	--	--	--
PH-1Hs	12.4	39.8	64.8	32.6	138.2	561.2	83.6	116.2	10 - 50	0 - 0
PH-1Jn	0.7	--	--	--	--	--	--	--	--	--

MZ ID	Wet Flatwoods (Acres)	Current Average Overstory Conditions							Target Overstory Conditions	
		Pine BA (ft <sup>2</sup> /ac)	Pine TPA	Pine Volume (tons/ac)	Non-Pine BA (ft <sup>2</sup> /ac)	Non-Pine TPA	Non-Pine Volume (tons/ac)	Total Pine and Non-Pine Volume (tons/ac)	FNAI Reference Condition Pine BA Range (ft <sup>2</sup> /ac)	FNAI Reference Condition Non-Pine TPA Range
PH-1Ke	3.7	--	--	--	--	--	--	--	--	--
PH-1L	6.4	--	--	--	--	--	--	--	--	--
PH-1M	28.7	48.4	162.8	25.0	22.9	121.2	9.0	34.0	10 - 50	0 - 0
PH-1Nn	2.2	107.6	600.4	51.8	0.0	0.0	0.0	51.8	10 - 50	0 - 0
PH-1Ns	3.2	61.9	124.2	44.8	0.0	0.0	0.0	44.8	10 - 50	0 - 0
PH-1P	1.8	--	--	--	--	--	--	--	--	--
PH-1Q	0.6	--	--	--	--	--	--	--	--	--
PH-1Sn	5.2	88.0	149.7	69.2	0.0	0.0	0.0	69.2	10 - 50	0 - 0
PH-1T	20.1	81.7	77.7	71.4	22.5	115.6	12.8	84.3	10 - 50	0 - 0
PH-1Un	0.2	--	--	--	--	--	--	--	--	--
PH-1Us	1.7	--	--	--	--	--	--	--	--	--
PH-1V	5.3	--	--	--	--	--	--	--	--	--
PH-1W	5.7	--	--	--	--	--	--	--	--	--
PH-2Fe	7.4	--	--	--	--	--	--	--	--	--
PH-2Ge	2.1	--	--	--	--	--	--	--	--	--
PH-2Gw	19.5	30.9	49.2	23.8	0.0	0.0	0.0	23.8	10 - 50	0 - 0
PH-2H	1.7	--	--	--	--	--	--	--	--	--
PH-2J	29.9	68.1	79.5	55.5	80.8	334.8	41.9	97.3	10 - 50	0 - 0
PH-2N	42.3	48.3	87.4	35.4	112.2	441.0	64.4	99.8	10 - 50	0 - 0
PH-3A	0.1	--	--	--	--	--	--	--	--	--
PH-3B	0.6	--	--	--	--	--	--	--	--	--
PH-3De	12.4	35.3	23.7	34.1	36.9	35.0	37.4	71.6	10 - 50	0 - 0
PH-4An	1.5	--	--	--	--	--	--	--	--	--
PH-4Bc	7.5	7.2	14.6	5.6	0.0	0.0	0.0	5.6	10 - 50	0 - 0
PH-4Be	6.5	23.4	31.2	18.5	0.0	0.0	0.0	18.5	10 - 50	0 - 0
PH-4Bn	6.8	--	--	--	--	--	--	--	--	--
PH-4Dn	13.9	79.3	71.3	65.6	47.0	134.3	34.5	100.1	10 - 50	0 - 0
PH-4Ds	13.8	36.6	34.1	29.7	114.7	203.8	92.4	122.1	10 - 50	0 - 0
PH-4Fc	7.2	39.2	119.1	25.3	40.7	83.4	28.5	53.8	10 - 50	0 - 0
PH-4Fe	0.2	--	--	--	--	--	--	--	--	--
PH-4Fw	3.0	--	--	--	--	--	--	--	--	--
PH-4G	6.0	10.1	3.4	10.1	55.8	91.9	41.6	51.7	10 - 50	0 - 0
PH-5A	18.6	59.6	80.4	52.0	50.5	222.9	26.5	78.5	10 - 50	0 - 0
PH-5Bw	7.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	10 - 50	0 - 0

MZ ID	Wet Flatwoods (Acres)	Current Average Overstory Conditions							Target Overstory Conditions	
		Pine BA (ft <sup>2</sup> /ac)	Pine TPA	Pine Volume (tons/ac)	Non-Pine BA (ft <sup>2</sup> /ac)	Non-Pine TPA	Non-Pine Volume (tons/ac)	Total Pine and Non-Pine Volume (tons/ac)	FNAI Reference Condition Pine BA Range (ft <sup>2</sup> /ac)	FNAI Reference Condition Non-Pine TPA Range
PH-5Cs	0.8	--	--	--	--	--	--	--	--	--
PH-5En	4.1	--	--	--	--	--	--	--	--	--
PH-5Es	42.6	38.4	88.0	26.3	4.0	16.7	1.5	27.7	10 - 50	0 - 0
PH-5G	0.6	--	--	--	--	--	--	--	--	--
PH-5H	18.6	47.2	171.3	28.5	24.2	231.3	0.0	28.5	10 - 50	0 - 0
PH-5Jw	43.0	87.3	129.4	73.8	30.5	179.4	13.8	87.5	10 - 50	0 - 0
PH-5Ke	5.5	117.0	117.7	94.4	127.6	399.7	81.7	176.1	10 - 50	0 - 0
PH-5Ln	27.0	71.5	59.8	59.2	21.9	57.4	16.1	75.3	10 - 50	0 - 0
PH-5Ls	17.9	86.0	105.8	70.7	53.1	168.0	33.4	104.1	10 - 50	0 - 0
PH-5Mn	6.0	--	--	--	--	--	--	--	--	--
PH-5Ns	0.7	--	--	--	--	--	--	--	--	--
PH-5Nw	0.5	--	--	--	--	--	--	--	--	--
PH-5Pc	5.3	--	--	--	--	--	--	--	--	--
PH-5Rn	21.4	62.9	89.4	43.9	16.2	123.6	4.7	48.6	10 - 50	0 - 0
PH-5Rs	12.5	49.6	50.3	34.7	0.0	0.0	0.0	34.7	10 - 50	0 - 0
<b>Total</b>	<b>609.2</b>									

## 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.

Rainbow Springs State Park 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 Rainbow Springs 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 Rainbow Springs had pine overstory stocking levels within the range identified for corresponding FNAI Reference Sites. Conversely, most natural communities evaluated at the park had hardwood overstory stocking levels above the range 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.

Addendum \_\_\_\_\_  
Timber Management Analysis

**1. Management Context and Best Management Practices**

Timber management at Rainbow Springs State Park 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 NatComs. 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 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 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**



Rainbow Springs comprises a total of 1,472 acres in Marion County. A total of 1,134 acres are associated with three (3) NatCom types that are potential candidates for timber management. In March 2016, 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 September 2018. 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 Rainbow Springs, 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 September 2018 period may not be reflected in the following tables.

## Florida State Parks Timber Management Analysis

**Table 1. General summary statistics for Rainbow Springs State Park**

Number of Management Zones within the Park	29
Upland NatCom acres	1,149

### Mesic Flatwoods (140.8 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 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 Rainbow Springs 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 <sup>2</sup> /ac)	Pine TPA	Pine Volume (tons/ac)	Non-Pine BA (ft <sup>2</sup> /ac)	Non-Pine TPA	Non-Pine Volume (tons/ac)	Total Pine and Non-Pine Volume (tons/ac)	FNAI Reference Condition Pine BA Range (ft <sup>2</sup> /ac)	FNAI Reference Condition Non-Pine TPA Range
RS-1F	9.5	30.0	30.1	25.9	30.0	93.8	14.3	40.1	10 - 50	0 - 0
RS-2C	19.9	40.0	68.9	28.9	3.3	3.2	2.7	31.5	10 - 50	0 - 0
RS-2E	25.4	--	--	--	--	--	--	--	--	--
RS-3A	4.2	10.0	10.4	7.9	60.0	174.4	40.5	48.5	10 - 50	0 - 0
RS-3B	37.1	12.9	13.5	10.8	55.7	164.3	29.6	40.4	10 - 50	0 - 0
RS-3C	11.5	50.0	131.1	41.1	50.0	100.1	42.2	83.3	10 - 50	0 - 0
RS-4B	0.4	10.0	5.9	9.4	0.0	0.0	0.0	9.4	10 - 50	0 - 0
RS-4C	13.0	5.0	2.1	4.7	60.0	204.3	20.9	25.6	10 - 50	0 - 0
RS-5A	10.9	60.0	45.0	50.2	60.0	78.5	48.7	98.9	10 - 50	0 - 0
RS-5C	5.5	0.0	0.0	0.0	80.0	333.4	35.4	35.4	10 - 50	0 - 0
RS-5D	0.4	--	--	--	--	--	--	--	--	--
RS-5E	1.9	--	--	--	--	--	--	--	--	--
RS-5H	1.3	--	--	--	--	--	--	--	--	--
<b>Total</b>	<b>140.8</b>									

### Sandhill (985.6 acres)

Longleaf pine (*Pinus palustris*) is the preferred overstory pine species in the region. The FNAI reference site in this region for sandhill contains longleaf pine at a basal area (BA) of 20 to 60 square feet per acre with non-pine species between 0 and 79 trees per acre (TPA). The following table shows the overstory condition for this natural community at Rainbow Springs and target overstory condition for sandhill in this region.

**Florida State Parks  
Timber Management Analysis**

MZ ID	Sandhill (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
RS-1A	23.2	0.0	0.0	0.0	140.0	225.1	83.7	83.7	20 - 60	0 - 79
RS-1B	9.0	15.0	12.7	13.1	115.0	239.1	69.4	82.5	20 - 60	0 - 79
RS-1C	1.7	--	--	--	--	--	--	--	--	--
RS-1D	62.7	--	--	--	--	--	--	--	--	--
RS-1E	41.6	6.7	11.6	3.8	6.7	8.3	0.0	3.8	20 - 60	0 - 79
RS-1F	18.4	13.3	24.6	9.7	43.3	86.3	29.3	39.1	20 - 60	0 - 79
RS-1G	15.3	0.0	0.0	0.0	120.0	286.8	100.3	100.3	20 - 60	0 - 79
RS-1J	17.6	20.0	12.0	18.5	92.0	131.4	63.0	81.5	20 - 60	0 - 79
RS-1K	1.3	--	--	--	--	--	--	--	--	--
RS-2A	58.1	20.0	33.9	15.0	6.0	18.1	2.3	17.3	20 - 60	0 - 79
RS-2B	47.3	20.0	21.3	15.0	22.9	91.0	8.1	23.1	20 - 60	0 - 79
RS-2C	37.9	30.0	73.4	20.4	0.0	0.0	0.0	20.4	20 - 60	0 - 79
RS-2D	41.9	26.0	62.2	17.4	43.0	181.9	11.4	28.8	20 - 60	0 - 79
RS-2E	8.5	--	--	--	--	--	--	--	--	--
RS-3A	31.0	8.3	15.6	5.5	58.3	296.1	7.8	13.3	20 - 60	0 - 79
RS-3B	52.9	13.3	22.4	9.7	74.2	311.9	10.0	19.7	20 - 60	0 - 79
RS-3C	95.6	42.5	72.6	30.4	70.0	204.2	25.8	56.2	20 - 60	0 - 79
RS-4A	37.6	21.7	32.0	15.4	31.7	41.0	21.9	37.2	20 - 60	0 - 79
RS-4B	43.8	21.1	57.4	14.1	25.6	62.5	17.1	31.2	20 - 60	0 - 79
RS-4C	19.3	15.0	46.2	9.9	57.5	179.2	37.5	47.4	20 - 60	0 - 79
RS-5A	3.5	--	--	--	--	--	--	--	--	--
RS-5B	9.5	115.0	381.1	55.3	0.0	0.0	0.0	55.3	20 - 60	0 - 79
RS-5C	94.9	70.6	296.4	52.4	51.8	187.5	20.5	72.9	20 - 60	0 - 79
RS-5D	52.6	64.6	321.9	43.6	20.9	86.4	7.2	50.8	20 - 60	0 - 79
RS-5E	47.0	45.0	200.6	23.9	90.0	154.2	34.9	58.7	20 - 60	0 - 79
RS-5F*	37.1	--	--	--	--	--	--	--	--	--
RS-5G	75.3	56.4	289.1	36.3	40.0	106.4	25.6	61.9	20 - 60	0 - 79
RS-5H	1.6	--	--	--	--	--	--	--	--	--
<b>Total</b>	<b>985.9</b>									

**Scrubby Flatwoods (7.1 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 between 0 and 26 trees per acre (TPA). The following table shows the overstory condition for this natural community at Rainbow Springs and target overstory condition for scrubby flatwoods in this region.

**Florida State Parks  
Timber Management Analysis**

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
RS-2C	2.1	20.0	33.7	12.6	0.0	0.0	0.0	12.6	10 - 60	0 - 26
RS-2E*	2.4	--	--	--	--	--	--	--	--	--
RS-5A	2.6	0.0	0.0	0.0	20.0	254.0	0.0	0.0	10 - 60	0 - 26
<b>Total</b>	<b>7.1</b>									

## 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.

San Felasco Hammock State Park (San Felasco) 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 San Felasco 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 San Felasco had pine overstory stocking levels within the range identified for corresponding FNAI Reference Sites. Conversely, most natural communities evaluated at the park had hardwood overstory stocking levels above the range 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.

**Addendum \_\_\_\_\_ Timber  
Management Analysis**

**1. Management Context and Best Management Practices**

Timber management at San Felasco Hammock State Park (San Felasco) 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 NatComs. Candidate upland NatCom types may include mesic flatwoods, wet flatwoods, sandhill, upland pine and upland mixed woodland. There will likely be no scheduled timber management activities in other 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 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 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, 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***

San Felasco comprises a total of 6,928 acres in Alachua County. A total of 3,065 acres associated with four (4) upland NatCom types are potential candidates for timber management. In April and May 2016, an inventory based on field plots was conducted across and within these areas to quantify overstory, midstory and understory conditions. In addition, approximately 80 acres associated with a southern pine beetle salvage operation were re-inventoried in September 2018 and the associated data was used in quantifying current conditions. No field plots were placed in the powerline right-of-ways as this is an alternate landcover type and the DFC cannot be achieved. 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 September 2018. 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 San Felasco, 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 September 2018 period may not be reflected in the following tables.

# Florida State Parks Timber Management Analysis

**Table 1. General summary statistics for San Felasco State Park**

Number of Management Zones within the Park	44
Upland NatCom acres	6,060

## Mesic Flatwoods (70.7 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 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 San Felasco and target overstory condition for mesic flatwoods in this region.

MZ ID	Mesic 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
SFH-2A	32.5	36.7	62.1	28.7	43.3	207.2	10.5	39.2	10 - 50	0 - 0
SFH-2F*	1.0	--	--	--	--	--	--	--	--	--
SFH-2L*	0.3	--	--	--	--	--	--	--	--	--
SFH-2M	15.3	40.0	188.1	23.7	20.0	98.6	0.0	23.7	10 - 50	0 - 0
SFH-2R	21.7	33.3	42.2	27.3	50.0	165.4	24.9	52.2	10 - 50	0 - 0
<b>Total</b>	<b>70.8</b>									

## Sandhill (200.8 acres)

Longleaf pine (*Pinus palustris*) is the preferred overstory pine species in the region. The FNAI reference site in this region for sandhill contains longleaf pine at a basal area (BA) of 20 to 60 square feet per acre with non-pine species between 0 and 79 trees per acre (TPA). The following table shows the overstory condition for this natural community at San Felasco and target overstory condition for sandhill in this region.

MZ ID	Sandhill (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
SFH-2C*	6.4	--	--	--	--	--	--	--	--	--



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SFH-2D	102.0	70.9	59.4	80.3	30.9	55.3	29.8	110.1	20 - 60	0 - 79
SFH-2E	19.8	95.0	156.7	96.7	35.0	121.2	20.9	117.6	20 - 60	0 - 79

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MZ ID	Sandhill (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
SFH-2F	23.8	38.0	147.4	24.7	26.0	178.1	6.7	31.4	20 - 60	0 - 79
SFH-2G	12.7	33.3	68.4	27.9	93.3	105.9	65.4	93.3	20 - 60	0 - 79
SFH-2K	8.1	100.0	121.1	84.6	40.0	179.4	20.5	105.1	20 - 60	0 - 79
SFH-2L	3.6	20.0	17.4	24.9	140.0	258.0	110.5	135.4	20 - 60	0 - 79
SFH-2M	23.0	46.7	62.6	43.6	20.0	46.1	17.6	61.2	20 - 60	0 - 79
SFH-2Q*	1.5	--	--	--	--	--	--	--	--	--
<b>Total</b>	<b>200.9</b>									

### Upland Mixed Woodland (1,793.4 acres)

Longleaf pine (*Pinus palustris*), southern red oak (*Quercus falcata*), mockernut hickory (*Carya tomentosa*), and sand post oak (*Q. margaretta*) are the preferred overstory pine species in the region. The FNAI reference site in this region for upland mixed woodland contains longleaf pine at a basal area (BA) of 10 to 30 square feet per acre with non-pine species between 0 and 263 trees per acre (TPA). The following table shows the overstory condition for this natural community at San Felasco and target overstory condition for upland mixed woodland in this region.

MZ ID	Upland Mixed Woodland (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
SFH-1An	80.2	86.7	81.7	94.1	21.1	43.2	17.3	111.4	10 - 30	0 - 263
SFH-1Aw	73.2	66.3	51.0	56.2	82.5	172.0	53.4	109.6	10 - 30	0 - 263
SFH-1C	145.7	83.3	70.6	64.2	55.0	100.2	37.1	101.3	10 - 30	0 - 263
SFH-2C	51.3	82.5	64.5	99.5	45.0	64.5	40.3	139.8	10 - 30	0 - 263
SFH-2D	123.5	65.7	56.5	71.0	58.6	103.4	48.5	119.5	10 - 30	0 - 263
SFH-2E	129.9	49.1	36.0	51.1	77.3	196.7	58.5	109.6	10 - 30	0 - 263
SFH-2F	13.5	8.0	5.2	7.8	124.0	250.6	98.1	105.9	10 - 30	0 - 263
SFH-2G	39.1	48.6	50.3	47.3	57.1	115.3	45.3	92.7	10 - 30	0 - 263
SFH-2H	30.1	46.7	116.9	38.3	100.0	249.8	73.4	111.6	10 - 30	0 - 263

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SFH-2K	8.8	20.0	6.9	24.0	80.0	56.3	67.7	91.6	10 - 30	0 - 263
SFH-2L*	1.0	--	--	--	--	--	--	--	--	--
SFH-2M	17.3	48.0	166.8	35.6	40.0	98.0	18.6	54.1	10 - 30	0 - 263

## Florida State Parks Timber Management Analysis

MZ ID	Upland Mixed Woodland (Acres)	Current Average Overstory Conditions							Target Overstory Conditions	
		Pine BA (ft <sup>2</sup> /ac)	Pine TPA	Pine Volume (tons/ac)	Non-Pine BA (ft <sup>2</sup> /ac)	Non-Pine TPA	Non-Pine Volume (tons/ac)	Total Pine and Non-Pine Volume (tons/ac)	FNAI Reference Condition Pine BA Range (ft <sup>2</sup> /ac)	FNAI Reference Condition Non-Pine TPA Range
SFH-2N	104.4	40.0	86.4	33.5	24.0	52.8	14.0	47.6	10 - 30	0 - 263
SFH-2P	12.8	13.3	6.8	19.1	93.3	189.1	71.5	90.6	10 - 30	0 - 263
SFH-2Q	76.7	47.7	43.2	60.5	69.2	143.5	50.6	111.1	10 - 30	0 - 263
SFH-3A	32.0	77.1	100.3	78.1	77.1	209.5	34.7	112.8	10 - 30	0 - 263
SFH-3B	56.3	32.5	57.8	21.2	90.0	146.1	72.0	93.2	10 - 30	0 - 263
SFH-3C	81.3	40.0	68.3	34.8	80.0	137.3	63.2	98.0	10 - 30	0 - 263
SFH-3D	27.5	35.0	24.1	26.0	80.0	189.3	63.9	89.8	10 - 30	0 - 263
SFH-3E	112.8	37.8	27.4	37.9	83.3	148.5	52.4	90.4	10 - 30	0 - 263
SFH-3F	20.8	6.7	2.0	0.0	140.0	181.1	84.6	84.6	10 - 30	0 - 263
SFH-3G	14.9	140.0	103.2	162.4	0.0	0.0	0.0	162.4	10 - 30	0 - 263
SFH-3H	3.8	20.0	9.2	24.9	120.0	232.3	121.7	146.6	10 - 30	0 - 263
SFH-3J	6.5	40.0	52.9	13.9	80.0	73.4	64.2	78.1	10 - 30	0 - 263
SFH-3K	26.3	20.0	41.3	18.1	72.0	174.5	34.7	52.8	10 - 30	0 - 263
SFH-4A	74.7	6.3	10.6	4.0	31.3	49.4	15.3	19.3	10 - 30	0 - 263
SFH-4Be	65.5	48.3	102.9	35.3	3.3	11.5	0.0	35.3	10 - 30	0 - 263
SFH-4Bw	3.9	50.0	39.3	47.2	80.0	31.9	82.6	129.7	10 - 30	0 - 263
SFH-4C	64.2	70.0	92.6	62.7	80.0	42.2	43.6	106.4	10 - 30	0 - 263
SFH-4De*	1.8	--	--	--	--	--	--	--	--	--
SFH-4Dw	14.2	30.0	36.1	30.3	95.0	173.2	77.6	107.9	10 - 30	0 - 263
SFH-4E*	28.8	--	--	--	--	--	--	--	--	--
SFH-4Fe	50.3	49.0	97.9	38.4	0.0	0.0	0.0	38.4	10 - 30	0 - 263
SFH-4Fw	49.1	17.1	6.4	16.2	65.7	87.9	45.0	61.2	10 - 30	0 - 263
SFH-4G	67.6	0.0	0.0	0.0	93.3	195.9	40.1	40.1	10 - 30	0 - 263
SFH-4H	42.2	0.0	0.0	0.0	110.0	181.9	75.7	75.7	10 - 30	0 - 263
SFH-4J	41.5	10.0	12.0	3.0	95.0	56.3	50.7	53.6	10 - 30	0 - 263
<b>Total</b>	<b>1,793.5</b>									

### Upland Pine (1,000.4 acres)

Longleaf pine (*Pinus palustris*) is the preferred overstory pine species in the region. The FNAI reference site in this region for upland pine contains longleaf pine at a basal area (BA) of 30 to 80 square feet per

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acre with non-pine species between 0 and 26 trees per acre (TPA). The following table shows the overstory condition for this natural

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community at San Felasco and target overstory condition for upland pine in this region.

MZ ID	Upland Pine (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
SFH-1An*	1.4	--	--	--	--	--	--	--	--	--
SFH-1Aw	15.5	70.0	123.7	49.2	40.0	346.5	8.4	57.6	30 - 80	0 - 26
SFH-1B	24.4	83.3	122.8	61.2	50.0	65.4	32.1	93.3	30 - 80	0 - 26
SFH-2A	3.1	0.0	0.0	0.0	80.0	243.0	57.2	57.2	30 - 80	0 - 26
SFH-2B*	1.2	--	--	--	--	--	--	--	--	--
SFH-2C	14.6	130.0	116.5	136.1	0.0	0.0	0.0	136.1	30 - 80	0 - 26
SFH-2D	120.9	65.0	63.0	73.2	35.0	94.1	25.6	98.8	30 - 80	0 - 26
SFH-2E	95.5	37.3	53.8	37.0	76.0	226.9	41.6	78.6	30 - 80	0 - 26
SFH-2F*	1.9	--	--	--	--	--	--	--	--	--
SFH-2G	19.6	60.0	240.4	38.2	0.0	0.0	0.0	38.2	30 - 80	0 - 26
SFH-2H	22.8	75.0	57.6	68.5	80.0	193.6	56.4	124.8	30 - 80	0 - 26
SFH-2K	24.3	13.3	7.1	13.3	60.0	146.6	43.2	56.6	30 - 80	0 - 26
SFH-2L	5.2	20.0	17.9	20.4	0.0	0.0	0.0	20.4	30 - 80	0 - 26
SFH-2M	35.8	35.0	46.7	35.1	20.0	34.2	9.8	44.9	30 - 80	0 - 26
SFH-2N	8.0	0.0	0.0	0.0	10.0	48.6	4.9	4.9	30 - 80	0 - 26
SFH-2P*	2.0	--	--	--	--	--	--	--	--	--
SFH-2Q	10.1	100.0	61.3	108.4	40.0	139.6	29.1	137.5	30 - 80	0 - 26
SFH-2R	6.9	20.0	8.5	22.3	60.0	89.6	49.8	72.1	30 - 80	0 - 26
SFH-3A	109.8	78.9	109.6	82.9	68.9	178.6	41.5	124.4	30 - 80	0 - 26
SFH-3B	70.2	56.9	112.4	48.0	86.2	175.7	57.9	105.9	30 - 80	0 - 26
SFH-3C	22.3	44.0	159.8	33.5	64.0	116.9	19.2	52.7	30 - 80	0 - 26
SFH-3E*	1.8	--	--	--	--	--	--	--	--	--
SFH-3H	7.6	20.0	6.2	14.7	100.0	211.7	87.5	102.2	30 - 80	0 - 26
SFH-4A	48.3	34.0	55.9	26.6	62.0	78.7	28.6	55.2	30 - 80	0 - 26
SFH-4Be	58.6	54.4	103.3	43.5	7.8	17.6	4.3	47.7	30 - 80	0 - 26
SFH-4Bw*	33.1	--	--	--	--	--	--	--	--	--
SFH-4C	101.1	35.0	14.4	27.1	120.0	135.9	62.7	89.8	30 - 80	0 - 26
SFH-4De	42.0	11.3	9.4	6.6	27.5	25.4	18.1	24.7	30 - 80	0 - 26

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MZ ID	Upland Pine (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
SFH-4Dw	38.9	60.0	145.9	49.8	30.0	31.9	19.6	69.4	30 - 80	0 - 26
SFH-4Fw	28.8	62.0	233.7	43.9	2.0	5.6	0.0	43.9	30 - 80	0 - 26
SFH-5B	24.8	50.0	75.2	45.5	113.3	320.3	83.0	128.4	30 - 80	0 - 26
<b>Total</b>	<b>1,000.5</b>									

## **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.

Stephen Foster Folk Culture Center State Park (Stephen Foster) 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 Stephen Foster during the period covered by the Unit Management Plan (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 reference site descriptions 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 Stephen Foster had overstory pine stocking levels generally within the ranges 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.



**Addendum \_\_\_\_\_**  
**Timber Management Analysis**

**1. Management Context and Best Management Practices**

Timber management at Stephen Foster Folk Culture Center State Park (Stephen Foster) is based on the desired future condition (DFC) of a management zone or natural community (NatCom) as determined by the DRP Unit Management Plan (UMP), 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 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 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 fires, windstorms, insects, 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-strikes 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 a buffer zone might have to be removed to prevent significant damage.

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

Stephen Foster comprises 904 acres in Hamilton and Columbia Counties. A total of 595 acres are associated with three (3) upland NatCom types that are potential candidates for timber management. In November 2017, an inventory based on field plots was conducted across and within these areas to quantify overstory, midstory and understory conditions. Tree data captured in the 2017 inventory was grown-to-current (circa 2022) for this timber assessment using an industry-standard growth and yield model developed and maintained by the U.S. Forest Service (Forest Vegetation Simulator). 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 June 2022. 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 Stephen Foster, 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 June 2022 period may not be reflected in the following tables.

**Table 1. General summary statistics for Stephen Foster.**

Number of Management Zones within the Park	27
Upland NatCom acres	645

**Mesic Flatwoods (537.7 acres)**

Longleaf pine (*Pinus palustris*) and slash pine (*Pinus elliottii*) are the preferred overstory pine species in the region. The FNAI reference site in this region for mesic flatwoods contains longleaf and slash 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 Stephen Foster 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 <sup>2</sup> /ac)	Pine TPA	Pine Volume (tons/ac)	Non-Pine BA (ft <sup>2</sup> /ac)	Non-Pine TPA	Non-Pine Volume (tons/ac)	Total Pine and Non-Pine Volume (tons/ac)	FNAI Reference Condition Pine BA Range (ft <sup>2</sup> /ac)	FNAI Reference Condition Non-Pine TPA Range
STF-1	25.0	24.5	23.2	23.3	33.7	84.2	14.1	37.3	10 - 50	0 - 0
STF-2A	7.1	--	--	--	--	--	--	--	--	--
STF-2B	21.6	--	--	--	--	--	--	--	--	--
STF-2C	3.2	--	--	--	--	--	--	--	--	--
STF-2D	0.4	--	--	--	--	--	--	--	--	--
STF-2E	0.1	--	--	--	--	--	--	--	--	--
STF-3	15.1	71.3	29.9	79.3	32.4	34.3	32.5	111.8	10 - 50	0 - 0
STF-4A	5.2	--	--	--	--	--	--	--	--	--
STF-4B	9.9	--	--	--	--	--	--	--	--	--
STF-5	40.4	47.9	33.5	43.0	20.5	37.7	12.3	55.3	10 - 50	0 - 0
STF-6A	1.0	--	--	--	--	--	--	--	--	--
STF-6B	9.3	--	--	--	--	--	--	--	--	--
STF-6C	10.9	52.6	50.5	51.0	55.8	120.8	8.4	59.3	10 - 50	0 - 0
STF-7A	21.5	3.2	4.0	2.2	0.0	0.0	0.0	2.2	10 - 50	0 - 0
STF-7B	12.8	0.0	0.0	0.0	30.8	28.2	0.0	0.0	10 - 50	0 - 0
STF-7C	29.4	22.2	16.9	16.9	2.2	5.9	1.7	18.6	10 - 50	0 - 0
STF-7D	43.8	38.0	45.3	32.6	16.6	24.6	5.5	38.2	10 - 50	0 - 0
STF-7E	15.4	--	--	--	--	--	--	--	--	--
STF-7F	14.9	--	--	--	--	--	--	--	--	--
STF-7G	24.8	15.2	16.7	9.3	0.0	0.0	0.0	9.3	10 - 50	0 - 0
STF-8A	3.3	--	--	--	--	--	--	--	--	--
STF-8B	8.2	--	--	--	--	--	--	--	--	--
STF-8C	66.9	15.3	13.0	10.8	11.1	18.2	0.0	10.8	10 - 50	0 - 0
STF-8D	47.8	52.8	68.8	41.2	0.0	0.0	0.0	41.2	10 - 50	0 - 0
STF-8E	59.4	27.5	21.9	25.4	4.7	12.1	2.8	28.2	10 - 50	0 - 0
STF-8F	40.3	16.8	19.8	12.0	5.4	4.2	0.0	12.0	10 - 50	0 - 0
<b>Total</b>	<b>537.7</b>									

**Upland Mixed Woodland (14.5 acres)**

Longleaf pine (*Pinus palustris*) and southern red oak (*Quercus falcata*) are the preferred overstory species in the region. The FNAI reference site in this region for upland mixed woodland contains longleaf pine at a basal area (BA) of 10 to 30 square feet per acre with non-pine at a density of 26 to 132 trees per acre (TPA). The following table shows the overstory condition for this natural community at Stephen Foster

and target overstory condition for upland mixed woodland in this region.

MZ ID	Upland Mixed Woodland (Acres)	Current Average Overstory Conditions							Target Overstory Conditions	
		Pine BA (ft <sup>2</sup> /ac)	Pine TPA	Pine Volume (tons/ac)	Non-Pine BA (ft <sup>2</sup> /ac)	Non-Pine TPA	Non-Pine Volume (tons/ac)	Total Pine and Non-Pine Volume (tons/ac)	FNAI Reference Condition Pine BA Range (ft <sup>2</sup> /ac)	FNAI Reference Condition Non-Pine TPA Range
STF-2A	9.7	--	--	--	--	--	--	--	10 - 30	26 - 132
STF-8B	0.3	--	--	--	--	--	--	--	10 - 30	26 - 132
STF-8F	4.5	--	--	--	--	--	--	--	10 - 30	26 - 132
<b>Total</b>	<b>14.5</b>									

**Upland Pine (42.9 acres)**

Longleaf pine (*Pinus palustris*) is the preferred overstory pine species in the region. The FNAI reference site in this region for upland pine contains longleaf pine at a basal area (BA) of 30 to 80 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 Stephen Foster and target overstory condition for upland pine in this region.

MZ ID	Upland Pine (Acres)	Current Average Overstory Conditions							Target Overstory Conditions	
		Pine BA (ft <sup>2</sup> /ac)	Pine TPA	Pine Volume (tons/ac)	Non-Pine BA (ft <sup>2</sup> /ac)	Non-Pine TPA	Non-Pine Volume (tons/ac)	Total Pine and Non-Pine Volume (tons/ac)	FNAI Reference Condition Pine BA Range (ft <sup>2</sup> /ac)	FNAI Reference Condition Non-Pine TPA Range
STF-2A	8.4	--	--	--	--	--	--	--	--	--
STF-2B	4.8	--	--	--	--	--	--	--	--	--
STF-2C	2.6	--	--	--	--	--	--	--	--	--
STF-3	2.7	16.8	8.6	16.8	83.0	108.8	76.1	92.9	30 - 80	0 - 26
STF-7G	8.3	46.6	53.3	37.2	0.0	0.0	0.0	37.2	30 - 80	0 - 26
STF-8A	8.1	--	--	--	--	--	--	--	--	--
STF-8B	8.0	--	--	--	--	--	--	--	--	--
<b>Total</b>	<b>42.9</b>									

## **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.

Suwannee River State Park (Suwannee River) 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 Suwannee River during the period covered by the Unit Management Plan (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 reference site descriptions 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 Suwannee River had overstory pine stocking levels generally within the ranges 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.

**Addendum \_\_\_\_\_**  
**Timber Management Analysis**

**1. Management Context and Best Management Practices**

Timber management at Suwannee River State Park (Suwannee River) is based on the desired future condition (DFC) of a management zone or natural community (NatCom) as determined by the DRP Unit Management Plan (UMP), 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 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 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 fires, windstorms, insects, 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-strikes 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 a buffer zone might have to be removed to prevent significant damage.

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

Suwannee River comprises 1,933 acres in Hamilton, Madison, and Suwannee Counties. A total of 743 acres are associated with three (3) upland NatCom types that are potential candidates for timber management. From February to March 2016, an inventory based on field plots was conducted across and within these areas to quantify overstory, midstory and understory conditions. Tree data captured in the 2016 inventory was grown-to-current (circa 2022) for this timber assessment using an industry-standard growth and yield model developed and maintained by the U.S. Forest Service (Forest Vegetation Simulator). 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 June 2022. 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 Suwannee River, 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 June 2022 period may not be reflected in the following tables.

**Table 1. General summary statistics for Suwannee River.**

Number of Management Zones within the Park	22
Upland NatCom acres	1,474

**Sandhill (309.5 acres)**

Longleaf pine (*Pinus palustris*) is the preferred overstory pine species in the region. The FNAI reference site in this region for sandhill contains longleaf pine at a basal area (BA) of 20 to 60 square feet per acre with non-pine at a density of 0 to 79 trees per acre (TPA). The following table shows the overstory condition for this natural community at Suwannee River and target overstory condition for sandhill in this region.

MZ ID	Sandhill (Acres)	Current Average Overstory Conditions							Target Overstory Conditions	
		Pine BA (ft <sup>2</sup> /ac)	Pine TPA	Pine Volume (tons/ac)	Non-Pine BA (ft <sup>2</sup> /ac)	Non-Pine TPA	Non-Pine Volume (tons/ac)	Total Pine and Non-Pine Volume (tons/ac)	FNAI Reference Condition Pine BA Range (ft <sup>2</sup> /ac)	FNAI Reference Condition Non-Pine TPA Range
SR-1A	21.5	31.5	33.6	28.6	20.7	44.3	15.9	44.5	20 - 60	0 - 79
SR-1B	17.6	28.7	24.0	28.7	33.4	88.6	17.9	46.6	20 - 60	0 - 79
SR-1C	1.5	--	--	--	--	--	--	--	--	--
SR-2	96.2	39.0	45.0	34.7	1.2	5.9	0.5	35.2	20 - 60	0 - 79
SR-3A	20.8	58.4	110.4	46.0	6.1	11.1	4.9	50.9	20 - 60	0 - 79
SR-3B	11.4	43.4	68.0	35.5	5.6	6.7	4.8	40.4	20 - 60	0 - 79
SR-3C	3.4	20.3	10.9	21.6	44.9	74.6	40.1	61.7	20 - 60	0 - 79
SR-3D	1.1	--	--	--	--	--	--	--	--	--
SR-4A	56.6	19.4	15.0	19.6	65.9	73.7	60.4	79.9	20 - 60	0 - 79
SR-4B	5.7	--	--	--	--	--	--	--	--	--
SR-5	38.8	25.4	12.4	27.4	47.8	84.4	32.2	59.6	20 - 60	0 - 79
SR-6A	25.0	44.8	36.5	45.7	33.0	79.9	21.6	67.3	20 - 60	0 - 79
SR-6B	8.3	45.4	48.9	44.9	50.8	91.4	34.0	78.9	20 - 60	0 - 79
SR-6C	1.5	--	--	--	--	--	--	--	--	--
<b>Total</b>	<b>309.5</b>									

**Upland Mixed Woodland (369.1 acres)**

Longleaf pine (*Pinus palustris*) and southern red oak (*Quercus falcata*) are the preferred overstory species in the region. The FNAI reference site in this region for upland mixed woodland contains longleaf pine at a basal area (BA) of 10 to 30 square feet per acre with non-pine at a density of 26 to 132 trees per acre (TPA). The following table shows the overstory condition for this natural community at Suwannee River and target overstory condition for upland mixed woodland in this region.

MZ ID	Upland Mixed Woodland (Acres)	Current Average Overstory Conditions							Target Overstory Conditions	
		Pine BA (ft <sup>2</sup> /ac)	Pine TPA	Pine Volume (tons/ac)	Non-Pine BA (ft <sup>2</sup> /ac)	Non-Pine TPA	Non-Pine Volume (tons/ac)	Total Pine and Non-Pine Volume (tons/ac)	FNAI Reference Condition Pine BA Range (ft <sup>2</sup> /ac)	FNAI Reference Condition Non-Pine TPA Range
SR-1B	7.7	16.7	17.9	4.2	91.9	148.3	53.3	57.4	10 - 30	26 - 132
SR-1C	4.8	39.1	24.9	43.1	141.4	108.2	141.1	184.2	10 - 30	26 - 132
SR-4A	98.4	34.6	24.8	33.1	71.1	141.5	48.4	81.5	10 - 30	26 - 132
SR-6C	2.3	20.6	6.0	26.1	58.7	86.6	58.1	84.3	10 - 30	26 - 132



MZ ID	Upland Mixed Woodland (Acres)	Current Average Overstory Conditions							Target Overstory Conditions	
		Pine BA (ft <sup>2</sup> /ac)	Pine TPA	Pine Volume (tons/ac)	Non-Pine BA (ft <sup>2</sup> /ac)	Non-Pine TPA	Non-Pine Volume (tons/ac)	Total Pine and Non-Pine Volume (tons/ac)	FNAI Reference Condition Pine BA Range (ft <sup>2</sup> /ac)	FNAI Reference Condition Non-Pine TPA Range
SR-7	33.8	36.5	60.6	29.2	83.1	187.5	46.5	75.7	10 - 30	26 - 132
SR-8An	45.3	43.8	24.8	47.5	106.3	183.1	76.8	124.3	10 - 30	26 - 132
SR-8As	72.5	54.4	26.7	59.0	101.9	200.7	82.0	141.0	10 - 30	26 - 132
SR-8B	83.3	46.4	26.5	51.9	80.8	115.2	57.6	109.5	10 - 30	26 - 132
SR-8C	21.0	94.2	47.3	104.3	53.9	155.5	34.5	138.7	10 - 30	26 - 132
<b>Total</b>	<b>369.1</b>									

### Upland Pine (64.2 acres)

Longleaf pine (*Pinus palustris*) is the preferred overstory pine species in the region. The FNAI reference site in this region for upland pine contains longleaf pine at a basal area (BA) of 30 to 80 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 Suwannee River and target overstory condition for upland pine in this region.

MZ ID	Upland Pine (Acres)	Current Average Overstory Conditions							Target Overstory Conditions	
		Pine BA (ft <sup>2</sup> /ac)	Pine TPA	Pine Volume (tons/ac)	Non-Pine BA (ft <sup>2</sup> /ac)	Non-Pine TPA	Non-Pine Volume (tons/ac)	Total Pine and Non-Pine Volume (tons/ac)	FNAI Reference Condition Pine BA Range (ft <sup>2</sup> /ac)	FNAI Reference Condition Non-Pine TPA Range
SR-2	2.0	--	--	--	--	--	--	--	--	--
SR-3A	37.1	23.3	33.7	21.9	46.4	39.9	42.1	63.9	30 - 80	0 - 26
SR-3B	19.6	10.1	11.2	9.5	28.7	35.1	26.0	35.5	30 - 80	0 - 26
SR-3C	5.5	0.0	0.0	0.0	93.0	107.8	88.5	88.5	30 - 80	0 - 26
<b>Total</b>	<b>64.2</b>									

# **Florida State Parks Timber Management Analyses**

## **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.

Waccasassa Bay Preserve State Park (Waccasassa Bay) 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 Waccasassa Bay 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 Waccasassa Bay had pine overstory stocking levels within the range identified for corresponding FNAI Reference Sites. Conversely, most natural communities evaluated at the park had non-pine (hardwood) overstory stocking levels above the range 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.

# Florida State Parks Timber Management Analyses

## Addendum \_\_\_\_\_ Timber Management Analysis

### **1. Management Context and Best Management Practices**

Timber management at Waccasassa Bay Preserve State Park (Waccasassa Bay) 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 and scrubby flatwoods. There will likely be no scheduled timber management activities in historically hardwood-dominated or wetland natural communities. In some circumstances, timber management may include the harvesting and removal of overstory invasive/exotic trees. Descriptions of community types are detailed 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 may be 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 Analyses**

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, 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***

Waccasassa Bay comprises a total of 34,388 acres in Levy County. A total of 169 acres are associated with two (2) upland NatCom types that are potential candidates for timber management. In July 2017, an inventory based on field plots was conducted across and within a large percentage of 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 September 2018. 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 Waccasassa Bay, 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 September 2018 period may not be reflected in the following tables.

**Table 1. General summary statistics for Waccasassa Bay Preserve State Park**

## Florida State Parks Timber Management Analyses

Number of Management Zones within the State Park	10
Upland NatCom acres	169

### Mesic Flatwoods (168.4 acres)

Longleaf pine (*Pinus palustris*) and slash pine (*Pinus elliottii*) are the preferred overstory pine species in the region. The FNAI reference site in this region for mesic flatwoods contains longleaf and slash 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 Waccasassa Bay 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 <sup>2</sup> /ac)	Pine TPA	Pine Volume (tons/ac)	Non-Pine BA (ft <sup>2</sup> /ac)	Non-Pine TPA	Non-Pine Volume (tons/ac)	Total Pine and Non-Pine Volume (tons/ac)	FNAI Reference Condition Pine BA Range (ft <sup>2</sup> /ac)	FNAI Reference Condition Non-Pine TPA Range
WB-1A	25.8	0.0	0.0	0.0	40.0	114.3	10.0	10.0	10 - 50	0 - 0
WB-1B	69.6	13.3	17.2	10.9	26.7	61.9	9.9	20.8	10 - 50	0 - 0
WB-2	0.5	--	--	--	--	--	--	--	--	--
WB-6A	23.5	22.5	30.1	19.2	7.5	32.4	0.0	19.2	10 - 50	0 - 0
WB-6B	46.7	40.0	59.4	34.0	0.0	0.0	0.0	34.0	10 - 50	0 - 0
WB-6C	2.3	--	--	--	--	--	--	--	--	--
<b>Total</b>	<b>168.4</b>									

### Scrubby Flatwoods (0.5 acre)

Longleaf (*Pinus palustris*) and slash pine (*Pinus elliottii*) are the preferred overstory pine species in the region. The FNAI reference site in this region for scrubby flatwoods contains longleaf and slash pine at a basal area (BA) of 10 to 60 square feet per acre with non-pine at a density between 0 and 26 trees per acre (TPA). There has been no inventory data collected for this natural community at Waccasassa Bay.

MZ ID	Scrubby Flatwoods (Acres)	Current Average Overstory Conditions							Target Overstory Conditions	
		Pine BA (ft <sup>2</sup> /ac)	Pine TPA	Pine Volume (tons/ac)	Non-Pine BA (ft <sup>2</sup> /ac)	Non-Pine TPA	Non-Pine Volume (tons/ac)	Total Pine and Non-Pine Volume (tons/ac)	FNAI Reference Condition Pine BA Range (ft <sup>2</sup> /ac)	FNAI Reference Condition Non-Pine TPA Range
WB-6B	0.5	--	--	--	--	--	--	--	--	--
<b>Total</b>	<b>0.5</b>									

**Florida State Parks  
Timber Management Analyses**