Appendix P

Doris Leeper Spruce Creek Preserve (DLSCP)
Habitat Restoration Plan
November 15, 2012

Introduction

This Habitat Restoration Plan is developed as a supplement to the 2012 Doris Leeper Spruce Creek Preserve (DLSCP, Preserve) Management Plan, which is governed by requirements of the Florida Statutes, Florida Administrative Code, and guidelines in the State Lands Management Plan. Public lands held in title by the Board of Trustees, in full or in conjunction with other entities, must be evaluated to determine that the lands are managed for the purpose of acquisition. Management plans for State owned lands are reviewed every 5 years with an updated management plan every 10 years; this review does not apply to non-state owned lands in the Preserve. The Division of State Lands conducted a scheduled 5 year review specific to the state owned lands located within DLSCP in 2007 and 2012. The management plan was scheduled for a 10 year update in 2010. As of August 2012, the Division of State Lands had approved the updated management plan submitted by Volusia County Land Management.

Doris Leeper Spruce Creek Preserve is a nearly 2,500 acre multi-habitat preserve managed by Volusia County. There are two primary goals of acquisition stated for DLSCP: a) the conservation, restoration and protection of natural and historical resources and b) resource-based, public outdoor recreation which is compatible with the conservation, restoration and protection of these public lands.

The Preserve consists of tracts separated by Spruce Creek, Strickland Bay, Rose Bay, Murray Creek, the FEC railroad and US 1. These features result in tracts that are somewhat detached in terms of connectivity and management. As such, the individual tracts have been identified and evaluated individually. For the purpose of management, the County considers the entire Preserve one complete managed area; however, different management plans and regulations exist that determine management needs and actions on specific parcels due to different ownership and funding partners.

This document is intended to provide information and guidance for Volusia County Land Management staff on specific habitat restoration needs within Doris Leeper Spruce Creek Preserve.

This Habitat Restoration Plan includes the approved goals and objectives that will guide land management restoration activities, a priority for implementing those land management activities, and a habitat description.

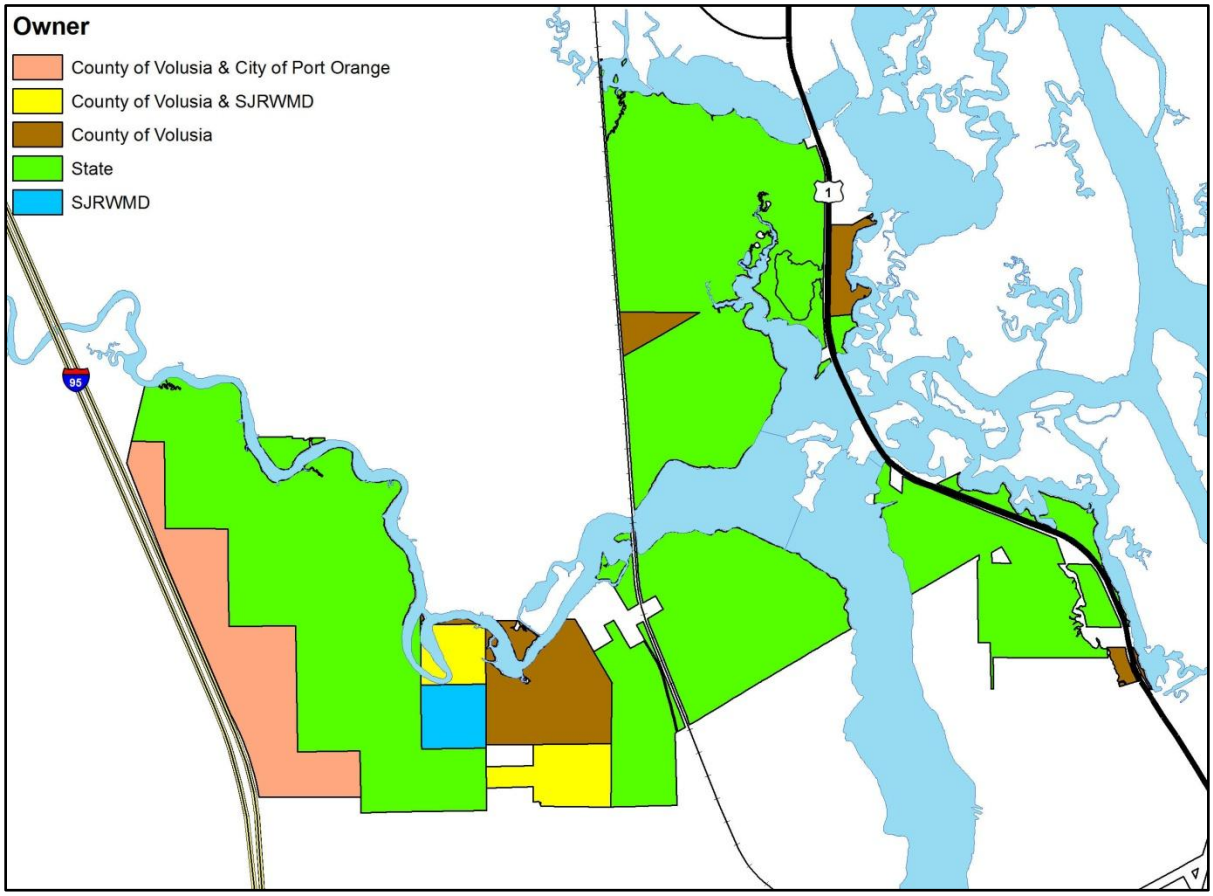
As with any restoration plan this document is fluid and never considered static. As additional information is gathered or as restoration science improves over time, restoration strategies are subject to change.

Parcel Ownership within DLSCP

Doris Leeper Spruce Creek Preserve is comprised of many parcels owned by various public agencies. The entire Preserve is managed by Volusia County. Most of the Preserve (78%) is owned by the State of Florida. Volusia County owns or co-owns, with the City of Port Orange and the St. John's Water Management District (WMD) 20% of the acreage within DLSCP. The WMD holds full fee title to a single parcel.

Funding sources for the public lands vary with each acquisition. With one exception, those parcels wholly owned by Volusia County and in combination with the City of Port Orange were acquired with assistance from the Florida's Community Trust. These tracts are managed under separate management plans that were developed with consideration to the State approved plan. Volusia County intends to manage DLSCP holistically across boundaries but also will need to follow management guidelines and conceptual plans set forth by the purchasing partners. For the purposes of this document, all community types and their acreages will be for DLSCP as a single entity.

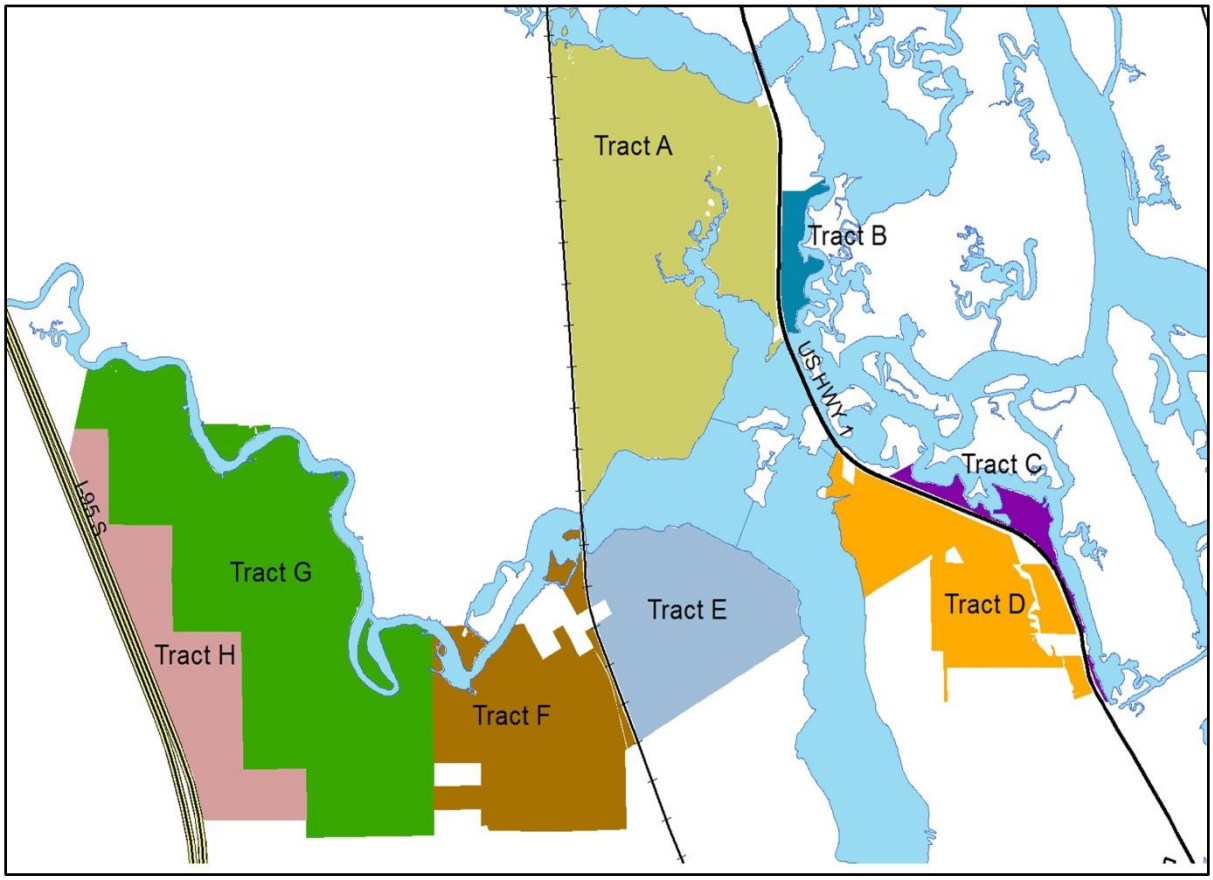
Doris Leeper Spruce Creek Preserve Ownership



Tract Identification

For ease of explanation, DLSCP has been divided into various tracts. These tracts roughly are based on access and ownership. As stated above, the management of DLSCP is coordinated holistically across parcels or ownership boundaries.

Doris Leeper Spruce Creek Preserve
Tract Identification



Goals and Objectives

The State approved 2012 DLSCP Management Plan includes goals and objectives related to management activities associated with habitat restoration for those lands owned by the State within the Preserve. These specific goals and objectives have been applied to the entire boundary of DLSCP, regardless of ownership or other management plans. The goals and objectives related to habitat management and restoration are referenced below.

1. **Goal: To protect, restore and improve native habitats trending away from optimal conditions located within DLSCP**

   Objective: Implement techniques to trend towards Desired Future Conditions/Habitat Maintenance Condition

Many of the natural communities on the Preserve have not burned for many years, resulting in dense canopies and/or subcanopies. Areas with a dense canopy or sub-canopy have decreased diversity and provide minimal habitat for listed plant and animal species due to increased shade, decreased space availability, decreased food availability, decreased herbaceous vegetation in the groundcover stratum, and decreased open patches. Xeric hammocks were historically rarer and smaller in acreage than present day and are formed as a result of fire suppression, usually due to human intervention.

Several communities on DLSCP are overgrown and require significant biomass reduction. The most critical occurrence of this is within the scrub communities, especially those on Tract G. The oaks and other shrub species have reached a height and caliper that have created a closed canopy. The structure of the scrub is inappropriate at this time, including height and density of the canopy/sub-canopy, lack of open ground space, and reduction in herbaceous vegetation in the ground stratum.

Many of the extant habitats would benefit from periodic removal of the dense canopy and/or sub-canopy of pines, oaks and other common shrub strata species through prescribed fire, manual removal or a combination of both. This reverses the unnatural conditions noted above and, with fire, can return nutrients to the soil and create favorable conditions for a diverse assemblage of species, including listed species.

Prescribed fire in the appropriate habitats is an important abiotic factor in the maintenance, restoration and improvement of many habitats. Other abiotic factors affecting habitat quality include hydrologic preservation and protection, and infrastructure management to protect habitats from potential multiple-use impacts.

Due to the extensive amount of fire suppressed vegetation within many of the habitats in the Preserve, mechanical treatments are necessary for the safety of prescribed fire personnel and the general public. The ultimate goal in a typical burning program is to allow for growing season burns to occur within the fire-dependent communities and to reach a stage where fire is being utilized as a habitat maintenance tool, rather than a restoration tool.

Many of the areas on the project site do not require management by fire, including the mesic hammocks, mangrove areas, salt marsh, and bottomland hardwood communities on the property. Although some areas, such as the salt marshes and the ecotones adjacent to the mesic hammocks, may benefit from periodic prescribed burns, other concerns including access constraints and the risk muck fires may limit the viability of prescribed fire for these areas.

2. **Goal: Establish a priority ranking of community habitats in need of restoration, starting with the Imperiled Habitats located within DLSCP**

   Objective: Implement techniques to trend towards Desired Future Conditions / Habitat Maintenance Condition

Three (3) natural communities, maritime hammock, scrub, and scrubby flatwoods, on the Preserve are listed by FNAI as Imperiled Natural Communities. These important areas will be assigned the "High" priority ranking with restoration activities focused on them. The Preserve includes 188 acres of maritime hammock, 330 acres of scrub, and 495 acres of scrubby flatwoods. Management activities include protection from illegal access related to dumping and off-road vehicle (ORV) use and prevention and maintenance of invasive exotic species. The scrub and scrubby flatwoods require more intensive restorative land management activities to reach acceptable conditions.

3. **Goal: To share information with the general public regarding activities associated with Land Management on DLSCP**

   Objective: To allow recreational users that utilize DLSCP to become informed of any access that might become restricted or suspended due to land management activities

Numerous access points located throughout DLSCP have become important for recreational users. Communicating with the public as far as temporary closures or detours in these areas is necessary. Informational signage, along with media announcements, will be the primary means of communicating upcoming temporary closures.

Desired Future Conditions

Volusia County has developed an objective-based approach to habitat management based on prescriptive Desired Future Conditions (DFCs). These DFCs are aimed at achieving a range of preferred habitat conditions that would benefit a diversity of plant and animal species. The DFCs represent long range preferred conditions and may be modified based upon implementation experience and evaluation of management activities.

Often, multiple phases of restoration activities may be necessary. In addition, vegetative response may require a long period of time to reach acceptable conditions, i.e. a forty year old tree needs forty years to grow. Therefore, compliance with DFCs may take years. It is more important to implement and monitor the restoration phases to ensure the habitat is trending toward the restoration goals. The restoration activities ultimately should lead to successful compliance with DFCs.

Monitoring will involve sampling for variables associated with particular DFCs within given areas. Land managers will use results obtained from monitoring to ascertain if the unit has met or are trending toward the DFC objectives. Additional management considerations and implementation may be utilized for those units that do not meet DFC objectives and are not trending toward desired conditions.

Priority Levels

It is anticipated that restoration activities will initiate within the given time frames. Full compliance with all DFCs may take multiple restoration treatments over an extended period of time. Potential restoration of some habitats need more detailed analysis. Pending further analysis, priorities and restoration actions may be modified. Habitat restoration priorities are based on the following criteria:

- **High – 0 to 3 years**
    - Imperiled status (scrub, scrubby flatwoods, maritime hammock)
    - High presence of endemic species
    - Declining listed species populations
    - High potential of restoration success
    - Cost effectiveness
    - Area does not meet DFCs
    - Management plan requirements

- **Medium – 2 to 5 years**
    - Habitat conditions at present provide a moderate level of natural functions
    - Needs additional site information to determine suitable restoration techniques
    - Area meets or within range of some DFCs
    - DFCs trending beyond acceptable range(s)
    - Management plan requirements

- **Low – 4 to 10 years**
    - Most DFCs are acceptable
    - DFCs trending beyond acceptable range(s)
    - Small fragmented acreage
    - Restoration options logistically or practically limited
    - Restoration options limited or unproven
    - Management plan requirements

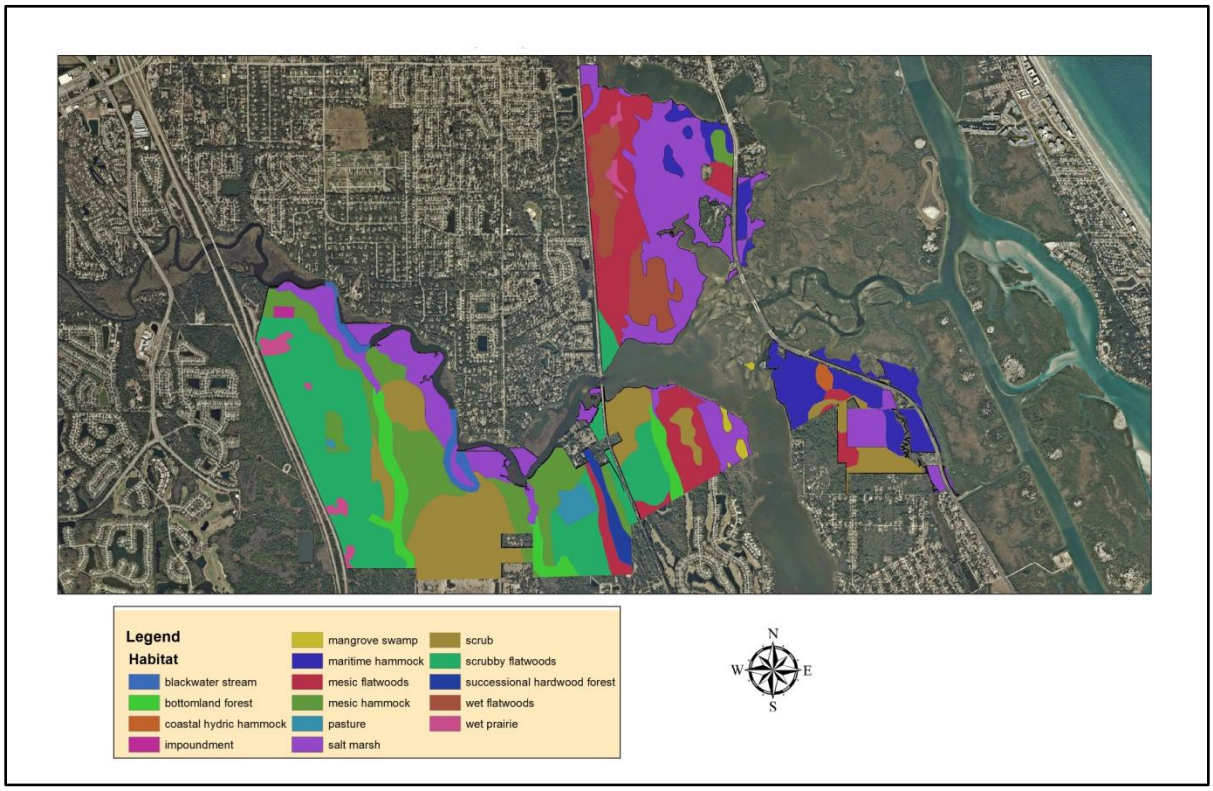
- **Maintenance**
    - Habitat meets all DFCs
    - Prescribed fire is used to maintain current conditions
    - No restoration is needed
    - Spot treatments of exotics may be needed
    - Management plan requirements

Priorities of DLSCP are relative to the other conservation lands managed by Volusia County. Other properties may be subjected to restoration actions prior to those of DLSCP. Decisions on implementation are based on many factors including cost, efficiency, potential restoration success, timing in conjunction with other activities, specific site conditions and equipment and staff availability.

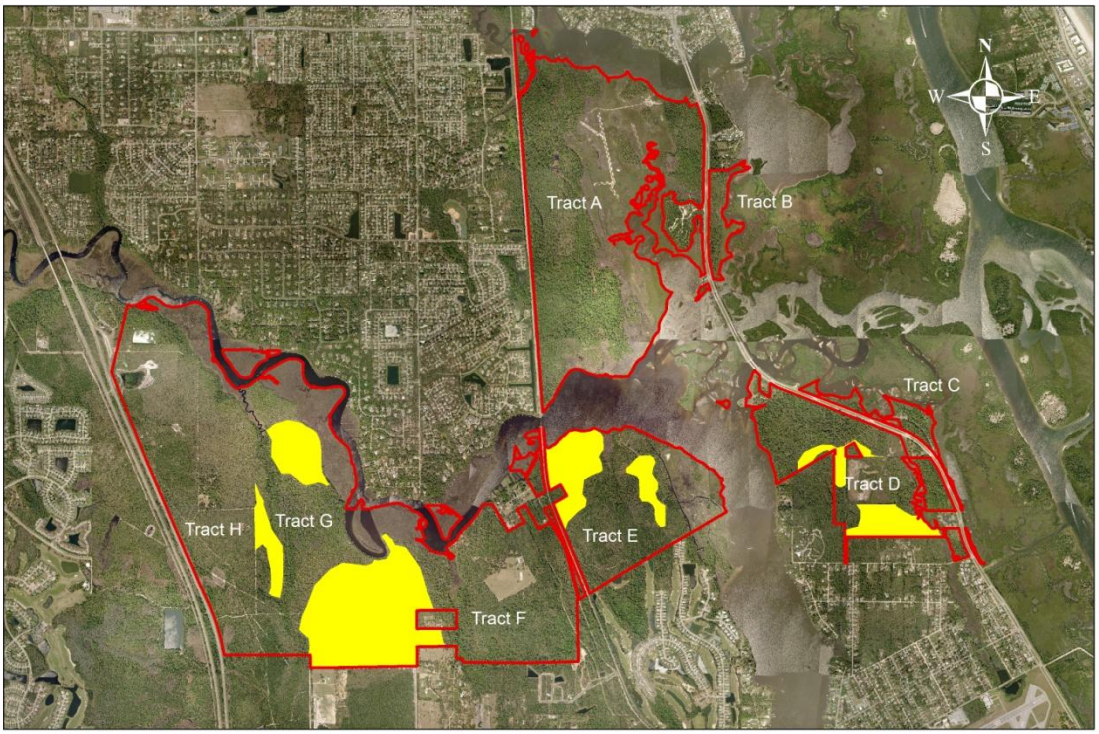
Habitat Descriptions

The habitat descriptions identified within DLSCP are based on the Guide to the Natural Communities of Florida, 2010 Edition, Florida Natural Areas Inventory (FNAI).

Doris Leeper Spruce Creek Preserve
Habitats



Doris Leeper Spruce Creek Preserve
Scrub
359 Acres



Background:

- Scrub is an imperiled community and provides habitat for scrub-jay
- Scrub is a shrub dominated evergreen community, primarily comprised of sand live, myrtle and Chapman oaks, with or without a canopy of sand pines
- Sand pine scrub, oak scrub and rosemary scrub are variants of scrub
- Scrub-jays are an "umbrella species" for oak scrub habitat, meaning that if the habitat is managed properly for scrub-jays then a large number of additional species will benefit
- Most, if not all, of the scrub located at DLSCP has become overgrown and therefore unsuitable for scrub-jays, although scrub-jays have been documented using adjacent property
    - Scrub-jay survey July 2010, mid-gasline
    - Volusia County Land Management staff, March 2012, powerline
    - February 2012, powerline
- Evidence of quality scrub indicated in historic aerials and current onsite vegetative composition
- Fire is the preferred restoration and management tool
- Urban interface conditions restrict the use of prescribed fire
- Fire has been suppressed for 60+ years
- Fire suppressed scrub creates extreme hazard conditions

- The long term goal of scrub restoration within DLSCP is to return scrub habitats to a natural structure that can be managed with prescribed fire, and ultimately, to increase the amount of high quality scrub suitable for scrub dependent species, including the Florida scrub-jay
- Access within areas of Tract G may be restricted for the safety of the public due to the presence of heavy machinery

Desired Future Conditions:

- Canopy cover
  - trees 0-10%
  - height less than 10 feet
- Sub-canopy
  - shrubs 10-30% cover
  - shrub height 4 to 5.5 feet
- Ground cover
  - herbs & grasses 20-40%
  - bare ground 20-40%
- Maintain 70 % of area in optimal condition
- Fire Frequency
  - 10- 20 years

General Restoration Strategies:

- Delineate scrub area and assess need of restoration
- Determine appropriate methods for restoration
- Survey restoration area for cultural resources
  - Continue field inspections as restoration progresses
- Establish photo monitoring locations
  - GPS locations for future reference
  - Photographs taken every 6 months for the first 2 years
- Mark gopher tortoise burrows found within restoration area
- Secure restoration area to ensure public safety
- Reduce the canopy cover to comply with DFC for Florida scrub
  - Harvest mature sand pine via a timber operation or individually by other means (Fellerbuncher, mulcher, chainsaw etc.)
- Rollerchop or utilize similar technique to alter the vegetative structure of the sub-canopy so that fire can be reintroduced safely
- Small groups or islands of scrubby oaks (1-3 trees) may remain as seed, nesting or sentinel trees provided they are not taller than 10’
- Trees not harvested or too large for equipment to chop would be cut selectively at a later date, leaving them on the ground to assist with prescribed fire
- Identify and remove refuse or garbage piles
- Establish fire breaks and delineate burn zones
  - Fire breaks should be between 10-20’ wide
  - Utilize natural fire breaks where possible
- Conduct prescribed fire

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    - Following mechanical treatment, prescribed fire should be conducted as soon as fuel conditions are appropriate
    - Alternative methods may be utilized if conditions do not warrant the use of prescribed fire within the optimal time frame
    - Develop scheduled rotation of burn zones for mosaic of scrub height
  - Monitor restoration area
    - Exotic and invasive species
    - Scrub-jay activity
    - Gopher tortoise activity
    - Photo points

<u>Specific Restoration Strategies by Tract</u>:

E - Priority - High

- Rollerchop dense areas of shrubs
- Conduct mechanical treatment near documented eagle nest only during May to September

G - Priority – High [See Appendix 1 for Buffer Plan and Map]

- Rollerchop dense areas of shrubs
- Trees remaining after the chopping is completed will be cut down by other mechanical means
- Portions of the scrub are seceding to xeric hammock, and the limit of chopping will be determined by the density of the trees too large to be roller chopped

D – Priority - Medium

- Additional evaluation of existing conditions and options is needed before initiating restoration operations

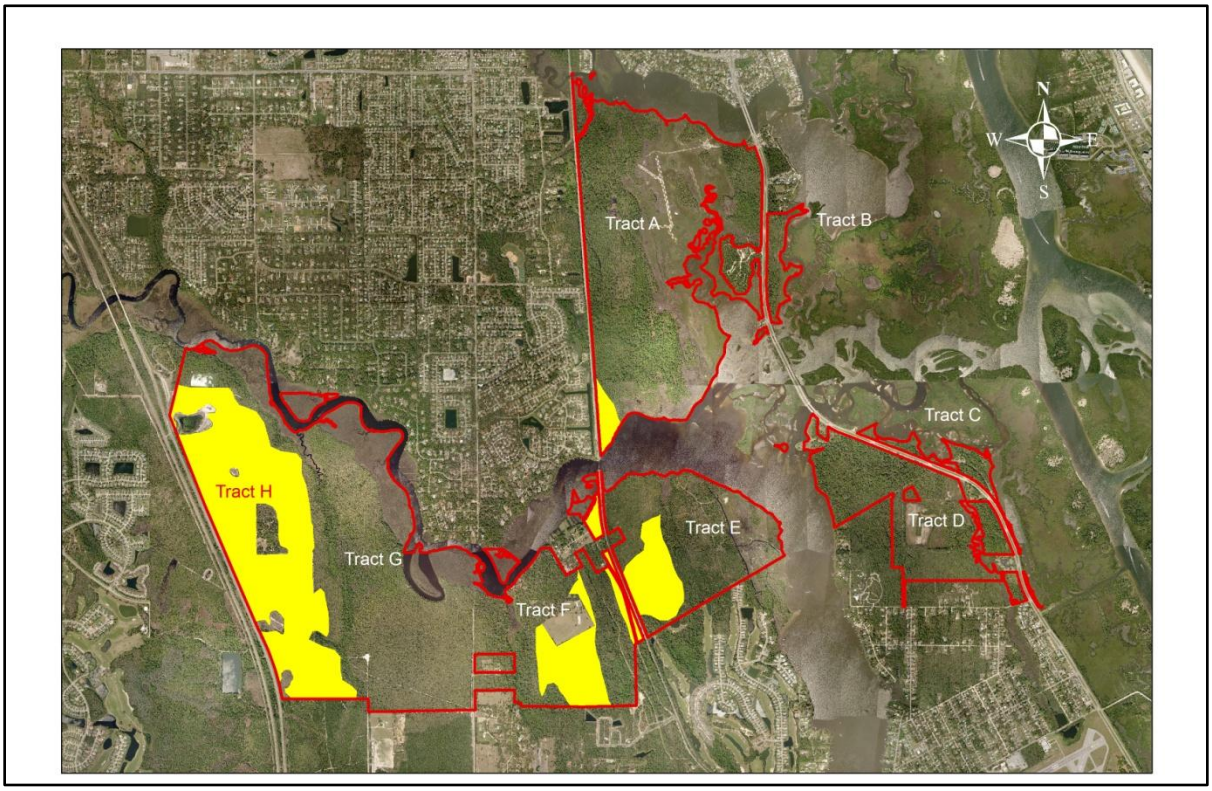
H - Priority - Medium

- Additional evaluation of existing conditions and options is needed before initiating restoration operations

F - Priority - Low

- Additional evaluation of existing conditions and options is needed before initiating restoration operations

Doris Leeper Spruce Creek Preserve
Scrubby Flatwoods
482 Acres



Background:

- Scrubby flatwoods is an imperiled community and provides moderate habitat for scrub-jay utilization especially where the pine overstory is sparse
- Pine flatwoods that have an open canopy of sparsely spaced tall slash or longleaf pines with a low sub-canopy of scrubby oaks and saw palmetto are classified as scrubby flatwoods
- Pine flatwoods forests are of special interest because they may provide nesting habitat for the bald eagle
- Usually shares some common traits with scrub habitat and is likely to harbor some species associated with scrub as well as species common to typical pine flatwoods
- Fire suppressed for 60+ years
- Fire suppressed scrub creates extreme hazard conditions
- Fire is the preferred restoration and management tool
- Urban interface conditions restrict the use of prescribed fire
- With the exclusion of fire, these areas become overgrown as the oak sub-canopy reaches heights in excess of 15-20 feet tall
- Most scrubby flatwoods areas on the Preserve have an overgrown sub-canopy and are also in need of mechanical treatment followed by prescribed fire
- Either mechanical treatment or prescribed fire is needed to reduce the sub-canopy to a lower height

Desired Future Conditions:

- Canopy cover
  - trees 10-50%
- Sub-canopy cover
  - shrubs 20-40%
  - palmetto 20-50%
  - shrub height 4-5.5 feet
- Ground cover
  - wiregrass 30-99%
  - herbs & grasses 10-50%
- Fire Frequency
  - 5-10 years

General Restoration Strategies:

- Delineate area and assess need of restoration
- Determine appropriate methods for restoration
- Survey restoration area for cultural resources
  - Continue field inspections as restoration progresses
- Establish photo monitoring locations
  - GPS locations for future reference
  - Photographs taken every 6 months for the first 2 years
- Mark gopher tortoise burrows found within restoration area
- Secure restoration area to ensure public safety
- Reduce the canopy cover to comply with DFC
  - Harvest pine sub-canopy via a timber operation or individually by other means (Fellerbuncher, mulcher, chainsaw etc.)
- Rollerchop or utilize similar technique to alter the vegetative structure of the sub-canopy so that fire can be reintroduced safely
- Identify and remove refuse or garbage piles
- Establish fire breaks and delineate burn zones
  - Fire breaks should be between 10-20' wide
  - Utilize natural fire breaks where possible
- Conduct prescribed fire
  - Following mechanical treatment, prescribed fire should be conducted as soon as fuel conditions are appropriate
  - Alternative methods may be utilized if conditions do not warrant the use of prescribed fire within the optimal time frame
- Monitor restoration area
  - Exotic and invasive species
  - Scrub-jay activity
  - Gopher tortoise activity
  - Photo points

Specific Restoration Strategies by Tract:

E - Priority - High

- Rollerchop dense/thick areas of scrub
- Conduct mechanical treatment near documented eagle nest only during May to September

G - Priority - High

- Rollerchop overgrown scrubby flatwoods with either aerator chopper or roller chopper depending on conditions

H - Priority - Medium

- Additional evaluation of existing conditions and options is needed

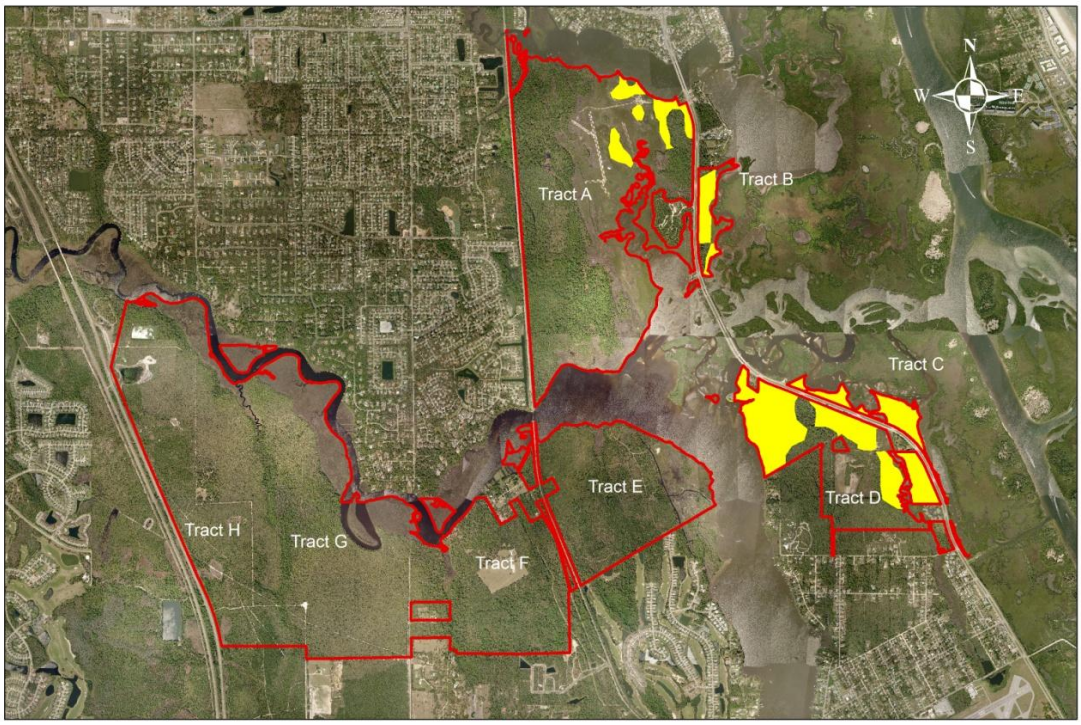
A - Priority – Low

- Due to the small area and access issues, no restoration is planned at this time

F - Priority - Low

- Additional evaluation of existing conditions and options is needed before initiating restoration operations

Doris Leeper Spruce Creek Preserve
Maritime Hammock
188 Acres



Background:

- Maritime hammock is predominantly evergreen hardwood forest growing on stabilized coastal dunes lying at varying distances from the shore
- The maritime hammocks found within the Preserve have a closed canopy dominated by live oak, cabbage palm, southern magnolia, and pignut hickory
- The invasive exotic Australian pine also was noted within the maritime hammock communities of the Preserve, although it is limited in occurrence
- Aside from continual threat of invasive exotics along edges, this system is considered good quality and in maintenance condition. No large stands of exotics are present and no major restoration activities appear necessary
- Fire is naturally rare in this community and is not planned as a management tool

Desired Future Conditions:

- Canopy
  - 80-100%
- Sub-canopy
  - shrubs 10-30%
- Ground cover
  - herbs & grasses 10-20%
- Fire Frequency
  - rare

General Restoration Strategies:

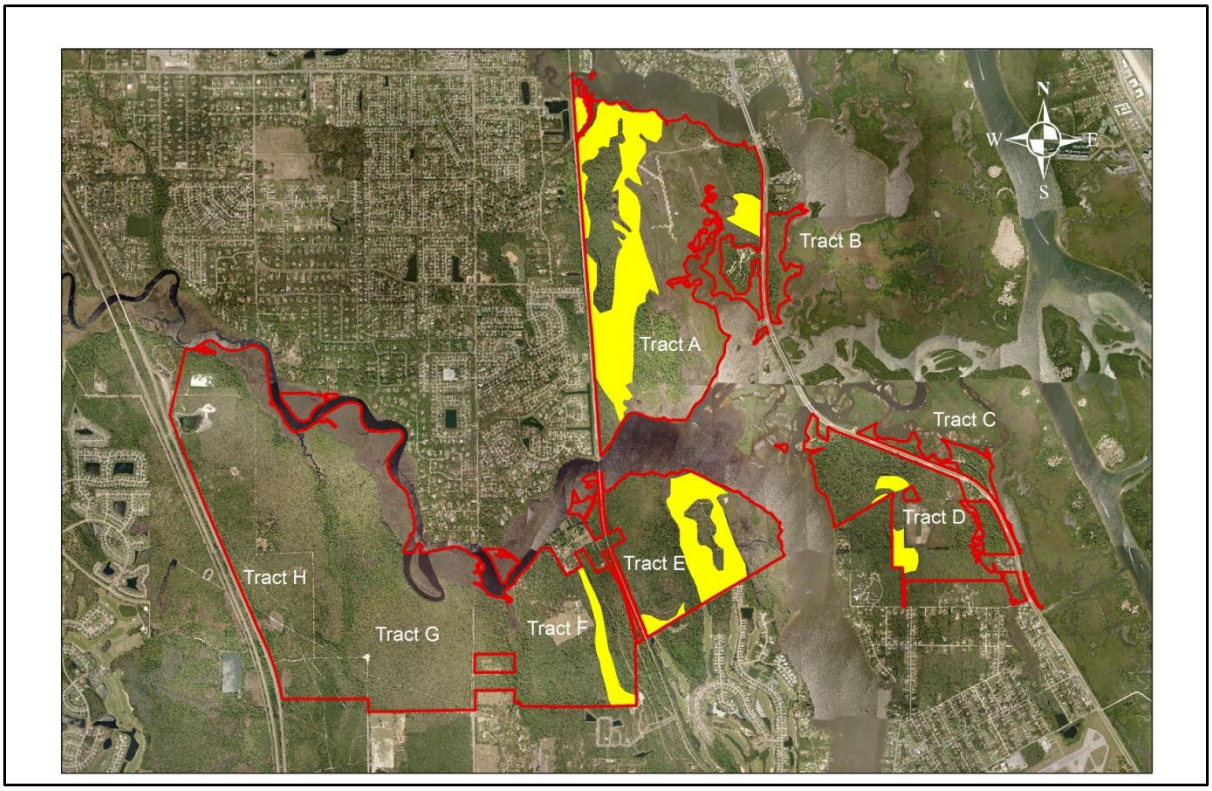
- Survey restoration area for cultural resources
  - Continue field inspections as restoration progresses
- Monitor and treat for exotic and invasive species of plants and animals
- Identify and remove refuse or garbage

Specific Restoration Strategies by Tract:

Priority – Maintenance

- No restoration needs or strategies for maritime hammock located on DLSCP have been identified

Doris Leeper Spruce Creek Preserve
Mesic Flatwoods
294 Acres



Background:

- Mesic flatwoods is characterized by an open canopy of tall pines, shrubs and a dense groundcover including many species of grasses and forbs
- Historically this community's canopy was dominated by longleaf pine
- Fire exclusion has altered the herbaceous groundcover
- Fire is the preferred restoration and management tool
- Urban interface conditions may restrict the use of prescribed fire
- Mesic flatwoods found on DLSCP are not in maintenance condition, and additional treatments in addition to prescribed fire will be required

Desired Future Conditions:

- Canopy
  - 10-50%
- Sub-canopy
  - shrubs 20-40%
  - palmetto 20-30%
- Ground cover
  - wiregrass 10-70%
  - herbs & grasses 10-20%
- Fire Frequency
  - 2-4 years
  - Growing season burns favored

General Restoration Strategies:

- Delineate area and assess need of restoration
- Determine appropriate methods for restoration
- Survey restoration area for cultural resources
  - Continue field inspections as restoration progresses
- Establish photo monitoring locations
  - GPS locations for future reference
  - Photographs taken every 6 months for the first 2 years
- Mark gopher tortoise burrows found within restoration area
- Secure restoration area to ensure public safety
- Reduce the canopy cover to comply with DFC
  - Harvest sub-canopy pine via a timber operation or individually by other means (Fellerbuncher, mulcher, chainsaw etc.)
  - Limit damage to remaining canopy trees
- Rollerchop or utilize similar technique to alter the vegetative structure of the sub-canopy so that fire can be reintroduced safely
- Identify and remove refuse or garbage piles
- Establish fire breaks and delineate burn zones
  - Fire breaks should be between 10-20' wide
  - Utilize natural fire breaks where possible
- Conduct prescribed fire
  - Following mechanical treatment, prescribed fire should be conducted as soon as fuel conditions are appropriate
  - Alternative methods may be utilized if conditions do not warrant the use of prescribed fire within the optimal time frame
- Monitor restoration area
  - Exotic and invasive species
  - Gopher tortoise activity
  - Photo points

Specific Restoration Strategies by Tract:

A - Priority – Medium

- Introduce prescribed fire

D - Priority - Medium

- Additional evaluation of existing conditions and options is needed before initiating restoration operations

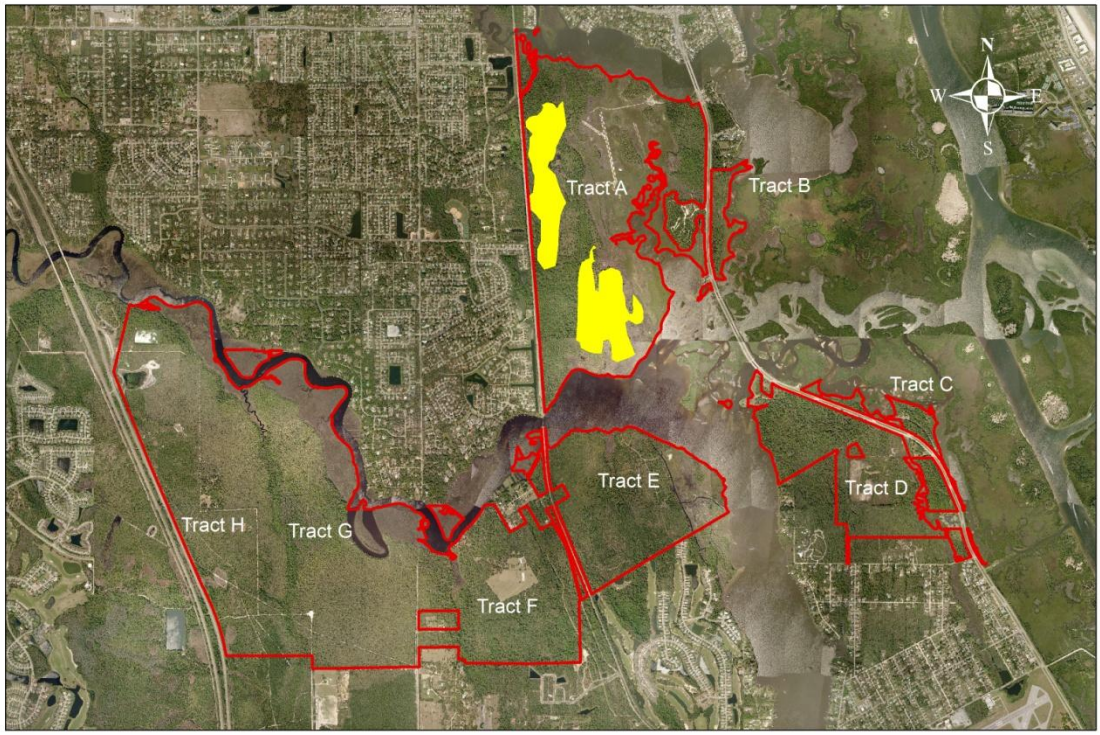
E - Priority - Medium

- Roller chop sub-canopy layer
- Larger pine trees will limit roller chopping

F - Priority - Low

- Additional evaluation of existing conditions and options is needed before initiating restoration operations

Doris Leeper Spruce Creek Preserve
Wet Flatwoods
119 Acres



Background:

- Pine forests with a sparse or absent sub-canopy and a dense groundcover of hydrophytic grasses, herbs, and low shrubs
- Due to fire suppression, the groundcover layer is suppressed and the shrub layer dominates
- Fire is the preferred restoration and management tool
- Urban interface conditions may restrict the use of prescribed fire

Desired Future Conditions:

- Canopy cover
  - trees 50-80%
- Sub-canopy cover
  - shrubs 0-10%
- Ground cover
  - herbs & grasses 30-100%
    - wiregrass dominated
- Fire frequency
  - 5-7 years
  - growing season burns favored

General Restoration Strategies:

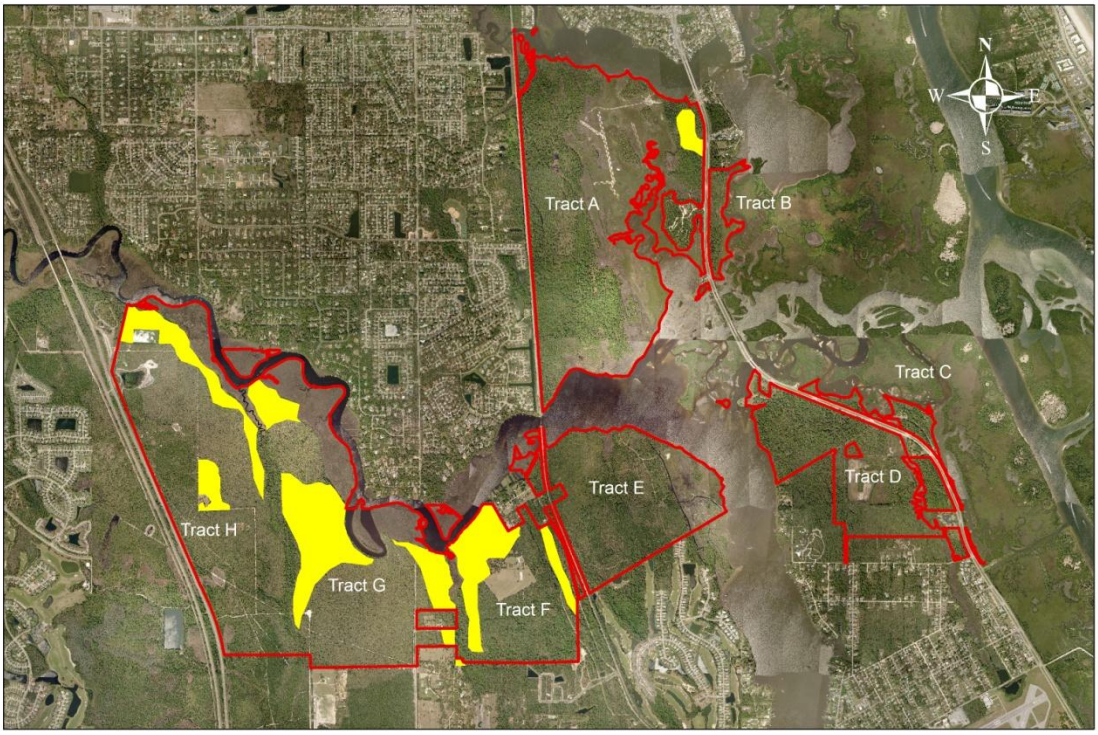
- Delineate area and assess need of restoration
- Determine appropriate methods for restoration
- Survey restoration area for cultural resources
    - Continue field inspections as restoration progresses
- Establish photo monitoring locations
    - GPS locations for future reference
    - Photographs taken every 6 months for the first 2 years
- Mark gopher tortoise burrows found within restoration area
- Secure restoration area to ensure public safety
- Reduce the canopy cover to comply with DFC
    - If applicable, harvest mature pine via a timber operation or individually by other means (Fellerbuncher, mulcher, chainsaw etc.)
    - Limit damage to remaining canopy trees
- Rollerchop or utilize similar technique to alter the vegetative structure of the sub-canopy so that fire can be reintroduced safely
- Identify and remove refuse or garbage piles
- Establish fire breaks and delineate burn zones
    - Fire breaks should be between 10-20' wide
    - Utilize natural fire breaks where possible
- Conduct prescribed fire
    - Following mechanical treatment, prescribed fire should be conducted as soon as fuel conditions are appropriate
    - Alternative methods may be utilized if conditions do not warrant the use of prescribed fire within the optimal time frame
- Monitor restoration area
    - Exotic and invasive species
    - Gopher tortoise activity
    - Photo points

Specific Restoration Strategies by Tract:

A - Priority - Medium

- Investigate alternative timbering techniques
- Occurs in a remote area of A that might be challenging as far as equipment for burning
- Railroad tracks and wet areas make timber harvest problematic

Doris Leeper Spruce Creek Preserve
Mesic Hammock
270 Acres



Background:

- Dominated by canopy trees which include large oaks, cabbage palm, southern magnolia and hickory
- Canopy usually closed
- Understory consists of saw palmetto, scrub olive and yaupon holly
- Restoration of mesic hammock to scrub may not be feasible
- Parent habitat historically was scrub. Fire suppression resulted in succession to mesic hammock
- Historic range of habitat was limited to areas protected from natural fires, i.e. islands in swamps
- Not fire adapted
- Healthy and functioning at optimum levels

Desired Future Conditions:

- Canopy
  - tree 50-100%
- Sub-canopy
  - shrubs 20-60%
- Ground cover
  - herbs & grasses 10-20%
- Fire Frequency
  - Rare

General Restoration Strategies:

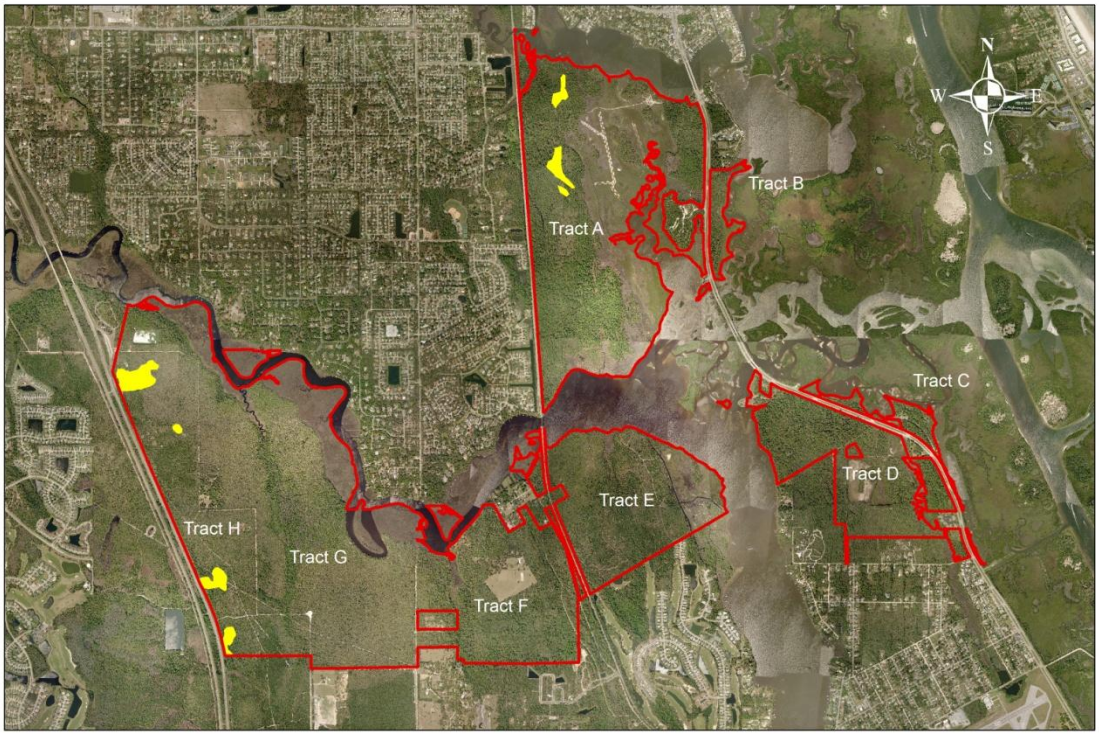
- Survey restoration area for cultural resources
  - Continue field inspections as restoration progresses
- Mesic hammock is not a fire adapted community
- Monitor and treat for exotic plant and animal species
- Identify and remove refuse or garbage

Specific Restoration Strategies by Tract:

Priority - Maintenance

- All mesic hammock located on DLSCP are considered in maintenance condition and will be monitored for both exotic plants and animals
- Consider experimental restoration of small areas of mesic hammock in the future

Doris Leeper Spruce Creek Preserve
Wet Prairie
32 Acres



Background:

- Wet prairies are small herbaceous depressions found on wet and inundated soils within wet and mesic flatwoods
- Fire is the preferred restoration and management tool
- Fire frequency is subject to conditions of surrounding landscape
- Urban interface conditions may restrict the use of prescribed fire
- In the absence of fire, habitat will become overgrown with trees and shrubs

Desired Future Conditions:

- Canopy cover
  - trees 0-20%
- Sub-canopy cover
  - shrubs 0-20%
- Ground cover
  - herbs & grasses 30-100%
    - wiregrass dominated
- Fire frequency
  - 2-4 years

General Restoration Strategies:

- Survey restoration area for cultural resources
    - Continue field inspections as restoration progresses
- When a wet prairie is within or adjacent to an upland fire adapted community, it may be included in the burn plan for that individual zone
- Monitor restoration area
    - Exotic and invasive species
    - Vehicle or human traffic
    - Feral hog damage
- Identify and remove refuse or garbage

Specific Restoration Strategies by Tract:

Priority - Low

- Wet prairie communities imbedded within fire dependent habitats will be included into conceptual burn zone of the surrounding habitat

Doris Leeper Spruce Creek Preserve
Coastal Hydric Hammock
7 Acres

Background:

- DLSCP coastal hydric hammock is 100% cabbage palm canopy
- Understory dominated by palms and ferns occurring on moist soils
- Open understory
- Not a fire dependant community

Desired Future Conditions:

- Canopy cover
  - trees 50-100%
- Sub-canopy
  - shrubs 0-20%
- Ground cover
  - herbs & grasses 0-20%
- Fire frequency
  - rare

General Restoration Strategies:

- Survey restoration area for cultural resources
  - Continue field inspections as restoration progresses
- Identify and remove refuse or garbage

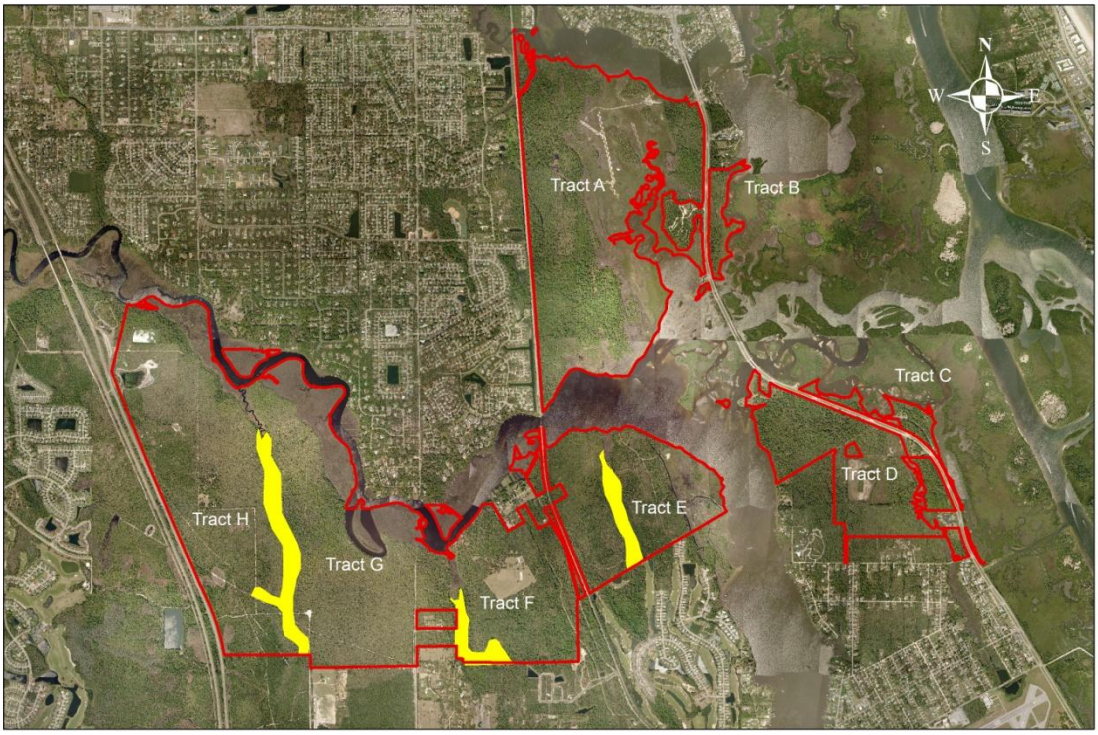
- Monitor to keep ground disturbance minimal
- Monitor and treat for exotic species

Specific Restoration Strategies by Tract:

Priority - Maintenance

- No restoration planned or anticipated at this time

Doris Leeper Spruce Creek Preserve
Bottomland Forest
96 Acres



Background:

- Closed canopy forest associated with riverine floodplains and depressions
- Dominated by large laurel oak, sweetbay, magnolia and cabbage palm
- Preferred habitat of the Florida black bear
- Not a fire adapted community

Desired Future Conditions:

- Canopy cover
  - trees 80-100%
- Sub-canopy
  - shrubs 20-50%
- Ground cover
  - herbs & grasses 0-20%
- Fire frequency
  - rare

General Restoration Strategies:

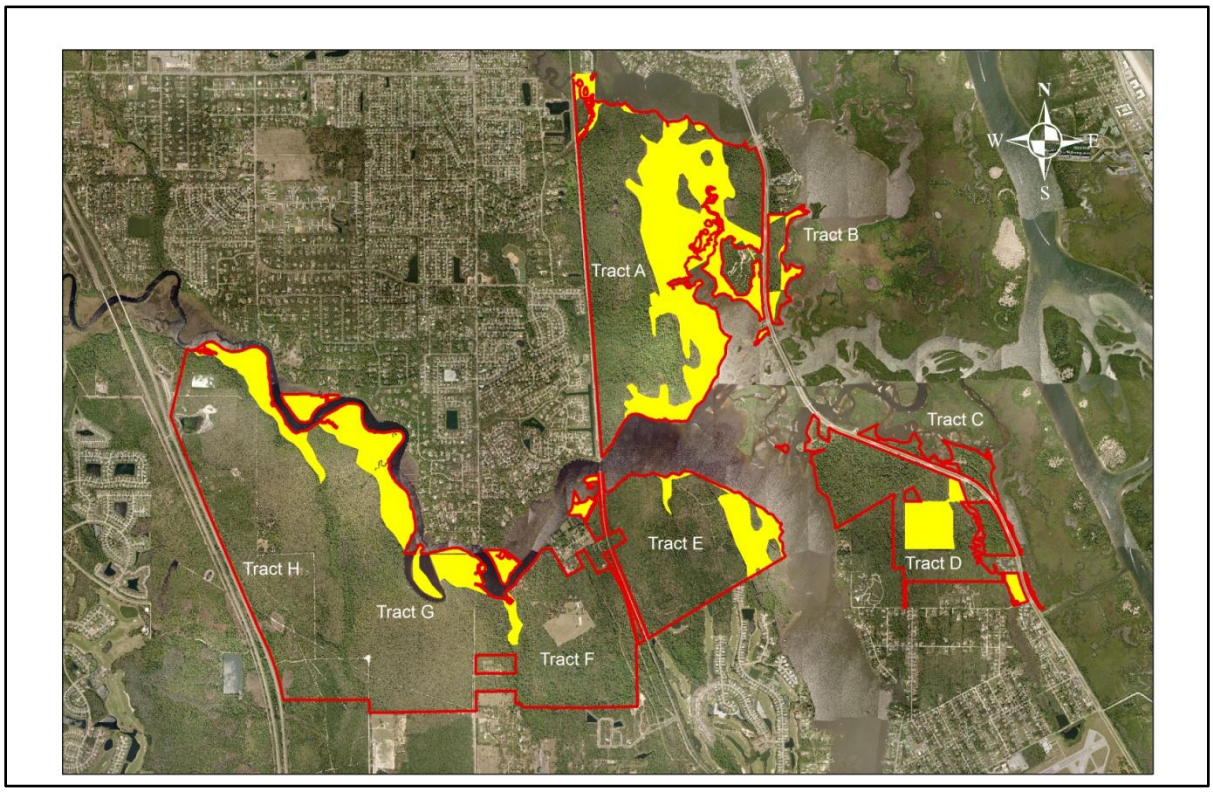
- Survey restoration area for cultural resources
    - Continue field inspections as restoration progresses
- Monitor to keep ground disturbance minimal
- Monitor and treat for exotic species
- Identify and remove refuse or garbage

Specific Restoration Strategies by Tract:

Priority - Maintenance

- No restoration planned or anticipated at this time

Doris Leeper Spruce Creek Preserve
Salt Marsh
445 Acres



Background:

- A tidally influenced aquatic herbaceous community dominated by cordgrass and needle rush
- Protected from wave activity by barrier islands
- Highly productive natural community providing a base for the food chain
- Numerous ditches are located within DLSCP, probably constructed in the 50's and 60's for mosquito control

Desired Future Conditions:

- Canopy cover
  - trees 0-10%
- Sub-canopy
  - shrubs 50-100%
- Ground cover
  - herbs & grasses 0-10%
- Fire frequency
  - occasional

General Restoration Strategies:

- Survey restoration area for cultural resources
- Continue field inspections as restoration progresses

Specific Restoration Strategies by Tract:

B - Priority - Medium

- Remove approximately 250' of old U.S. 1 causeway to improve tidal flow
- Evaluate need for planting appropriate species after causeway removal

Priority - Maintenance

- The largest quantity of ditching appears to be located on Tract A.
- Additional evaluation of existing conditions and options is needed before initiating restoration operations
- Coordination with Mosquito Control required
- Monitor and treat for exotic species

Doris Leeper Spruce Creek Preserve
Mangrove Swamp
7 Acres

<u>Background</u>:

- Dominated by black mangroves but red and white mangrove may be present
- Extremely sensitive to exotic species encroachment
    - Brazilian pepper
    - Australian pine
- Extremely important biological community
- Marine and estuarine organisms rely on the mangrove swamp to complete their life cycle
- Mangrove leaf shedding makes up most of the organic material available in the aquatic food web
- Provides important habitat for many rare and endangered flora and fauna
- Functions as a nursery for fish and shell fish

Desired Future Conditions:

- Canopy cover
  - trees 50-100%
- Sub-canopy
  - shrubs 50-100%
- Ground cover
  - herbs & grasses 0-10%
- Fire frequency
  - n/a

General Restoration Strategies:

- Survey restoration area for cultural resources
  - Continue field inspections as restoration progresses
- Monitor and treat for exotic species
- Exclude all recreational access to the adjacent open waters through intact mangrove areas
- Identify and remove refuse or garbage

Specific Restoration Strategies by Tract:

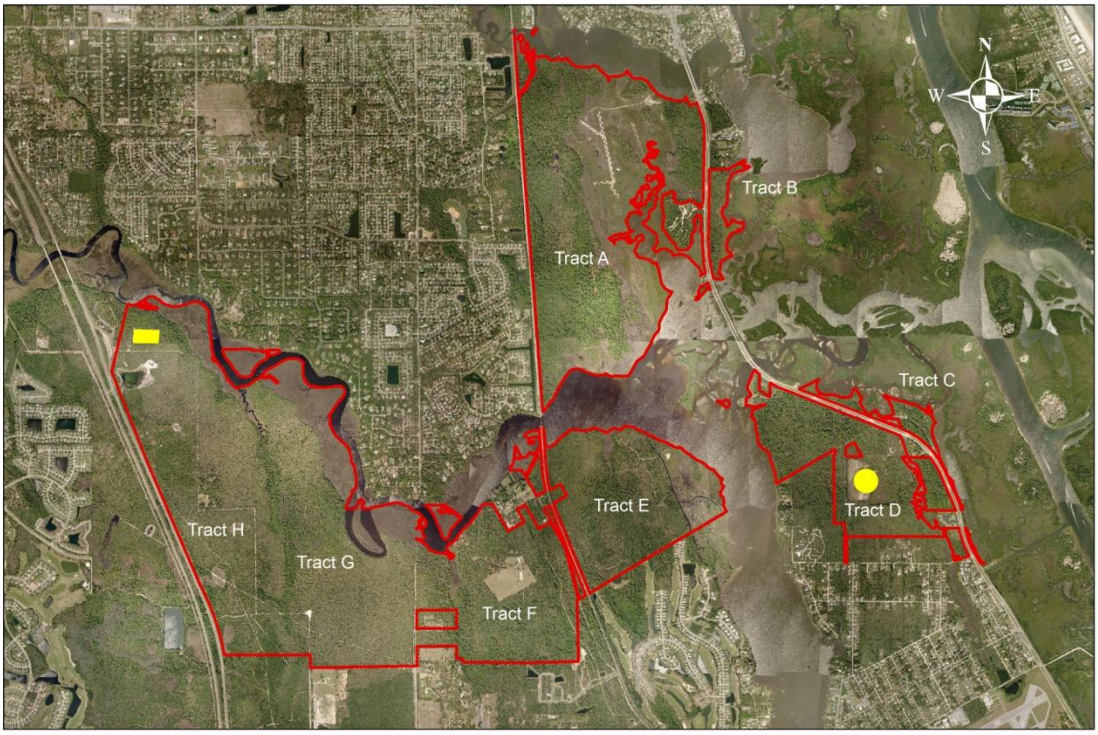
Priority - Maintenance

- Monitor and treat for exotic species

Blackwater Stream

During the development of this Restoration Plan it was discovered that the area mapped as blackwater stream is incorrect. The entire reach of the open water of Spruce Creek should be classified as Estuarine Unconsolidated Substrate. The blackwater streams that are found on site are associated with Bottomland Forest on the F and G tracts. Neither habitat type is in need of restoration. Sites will be monitored for the presence of exotic species and treated accordingly. Corrections to the Management Plan will be addressed in the next required update.

Doris Leeper Spruce Creek Preserve
Impoundment
40 Acres



Background:

- Freshwater borrow pit located on the west portion of Tract G approximately 15 acres
  - narrow littoral zone
  - large pelagic zone
- Borrow pit (denoted as a circle: mapped as salt marsh), approximately 35 acres, located on the D tract near US-1
  - tidally influenced
  - most likely created by removal of fill for US-1
  - has evolved into a functioning wetland utilized by wildlife
  - established fishing area

Desired Future Conditions:

- Canopy cover
  - trees 0-10%
- Sub-canopy
  - shrubs 0-10%
- Ground cover
  - n/a
- Fire frequency
  - n/a

General Restoration Strategies:

- Survey restoration area for cultural resources
    - Continue field inspections as restoration progresses
- The two areas classified as Impoundment will be monitored for exotic invasive plants and animals but no restoration has been discussed at this time
- If restoration is to be performed on either of these areas a plan would be formulated to guide the restoration
- Identify and remove refuse or garbage

Specific Restoration Strategies by Tract:

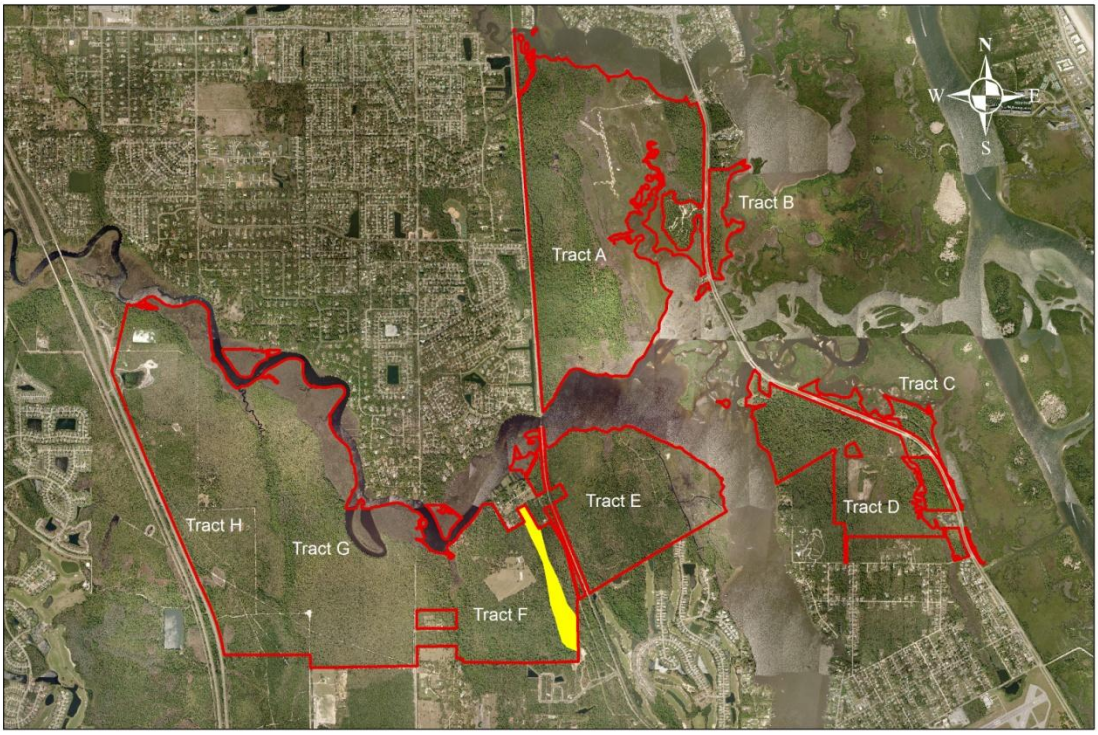
D - Priority - Maintenance

- Additional evaluation of existing conditions and options is needed before initiating restoration operations

G - Priority - Maintenance

- Monitor and treat for exotic species

Doris Leeper Spruce Creek Preserve
Successional Hardwood Forest
27 Acres



Background:

- Climax community for multiple parent habitats
- Created due to fire exclusion
    - Closed canopy hardwood forest
    - Dense sub-canopy, usually young trees of the canopy

Desired Future Conditions:

- Canopy cover
    - Trees - To be determined
- Sub-canopy
    - shrubs - To be determined
- Ground cover
    - herbs - To be determined
- Fire frequency
    - To be determined

General Restoration Strategies:

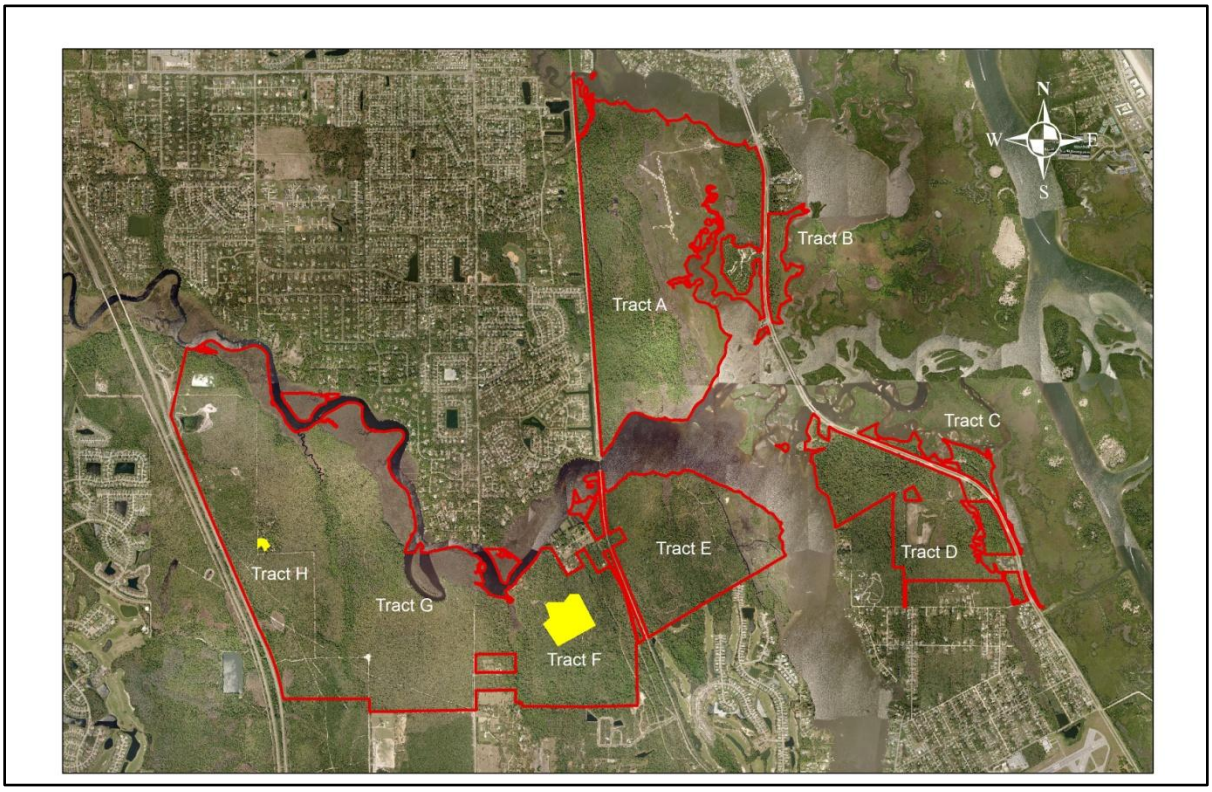
- Survey restoration area for cultural resources
    - Continue field inspections as restoration progresses
- Additional evaluation of existing conditions and options is needed to evaluate parent habitat and DFCs
- Identify and remove refuse or garbage

Specific Restoration Strategies by Tract:

Priority - Low

- Additional evaluation of existing and historic conditions and options is needed before initiating restoration operations

Doris Leeper Spruce Creek Preserve
Improved Pasture
25 Acres



Background:

- Tract F - cleared and planted with bahia grass in the mid 1970's
  - Used as equestrian trail head
- Tract G –site of historic and abandoned dairy
- Portions of pastures to be maintained for public use
  - Equestrian area
  - Group camping
- Potentially historic habitat is sandhill

Desired Future Conditions:

- Canopy cover
  - Trees – 30-60%
- Sub-canopy
  - shrubs – 10-40%
- Ground cover
  - herbs & grasses – 20-80%
    - wiregrass dominated
- Fire frequency
  - 2-3 years

General Restoration Strategies:

- Survey restoration area for cultural resources
    - Continue field inspections as restoration progresses
- Apply herbicide and mechanical removal to pasture as necessary
- Identify and remove refuse or garbage
- Establish groundcover by reseeding or planting
- Monitor and treat residual bahia grass
- Establish fire breaks and delineate burn zones
    - Fire breaks should be between 10'-20' wide
    - Utilize natural fire breaks where possible
- Conduct prescribed fire
- Plant longleaf pine in appropriate densities

- Monitor restoration area
    - Exotic and invasive species
    - Gopher tortoise activity
    - Photo points

Specific Restoration Strategies by Tract:

F - Priority – Medium

- Identify 10-15 acres of pasture to restore
- Maintain trail access
- Take steps to limit public access in the restoration area during restoration
- Apply herbicide to existing bahia grass
- Consider utilizing disking in restoration procedures
- Reseed restoration area with appropriate groundcover mixture
- Spot treat residual bahia grass as needed
- Conduct prescribed fire
- Plant longleaf pines at appropriate densities

G - Priority – Maintenance

- Maintain area for public use (group camping)

Priority Summary

Habitat	Tract		Priority
	Name	Acres	
Scrub	E	65	High
Scrub	G	235	High
Scrubby Flatwoods	E	54	High
Scrubby Flatwoods	G	126	High
Improved Pasture	F	23	Medium

Habitat	Tract		Priority
	Name	Acres	
Mesic Flatwoods	A	176	Medium
Mesic Flatwoods	D	17	Medium
Mesic Flatwoods	E	77	Medium
Salt Marsh	B	12	Medium
Scrub	H	3	Medium
Scrubby Flatwoods	H	204	Medium
Wet Flatwoods	A	119	Medium
Scrub	D	44	Medium
Mesic Flatwoods	F	24	Low
Scrub	F	12	Low
Scrubby Flatwoods	A	14	Low
Scrubby Flatwoods	F	84	Low
Successional Hardwood Forest	F	27	Low
Wet Prairie	A	9	Low
Wet Prairie	H	23	Low
Blackwater Stream	F	tbd	Maintenance
Blackwater Stream	G	tbd	Maintenance
Bottomland Forest	E	22	Maintenance
Bottomland Forest	F	22	Maintenance
Bottomland Forest	G	52	Maintenance
Coastal Hydric Hammock	D	7	Maintenance
Impoundment	G	5	Maintenance
Improved Pasture	H	2	Maintenance
Mangrove Swamp	E	7	Maintenance
Maritime Hammock	A	28	Maintenance
Maritime Hammock	B	17	Maintenance

Maritime Hammock	C	30	Maintenance
Maritime Hammock	D	113	Maintenance
Mesic Hammock	A	11	Maintenance
Mesic Hammock	F	95	Maintenance
Mesic Hammock	G	164	Maintenance
Salt Marsh	A	275	Maintenance
Salt Marsh	C	1	Maintenance
Salt Marsh	D	43	Maintenance
Salt Marsh	E	45	Maintenance
Salt Marsh	F	23	Maintenance
Salt Marsh	G	81	Maintenance
Shaded habitats need further evaluation			

Appendix 1

November 14, 2012
Draft Buffer Plan for 170 Acres in the Martin's Dairy Tract
of Doris Leeper Spruce Creek Preserve

Project Boundary: The scrub restoration area represents approximately 170 acres of the Doris Leeper Spruce Creek Preserve (DLSCP). This area is located on the Martin's Dairy tract, at the end of Martin's Dairy Road, bounded by the power line to the east and Spruce Creek to the north. The area has been identified as scrub habitat on surveys as far back as 1833, and is now overgrown primarily due to 60 years of fire suppression. This Buffer Plan corresponds to the November 6, 2012 DLSCP map.

Purpose: The buffer plan is a management strategy for a portion of the Martin's Dairy Tract of the DLSCP, which reduces the chance of a catastrophic fire, restores historic scrub habitat, and promotes compatible recreation activities, while ensuring safe conditions for the public and land managers.

Action Steps:

Zone A: Maintain the existing vegetation throughout a buffer of variable width, not less than 50 feet, throughout the western portion of the site. This buffer is expected to be 50-100 feet due to the transition of habitat types in this area.

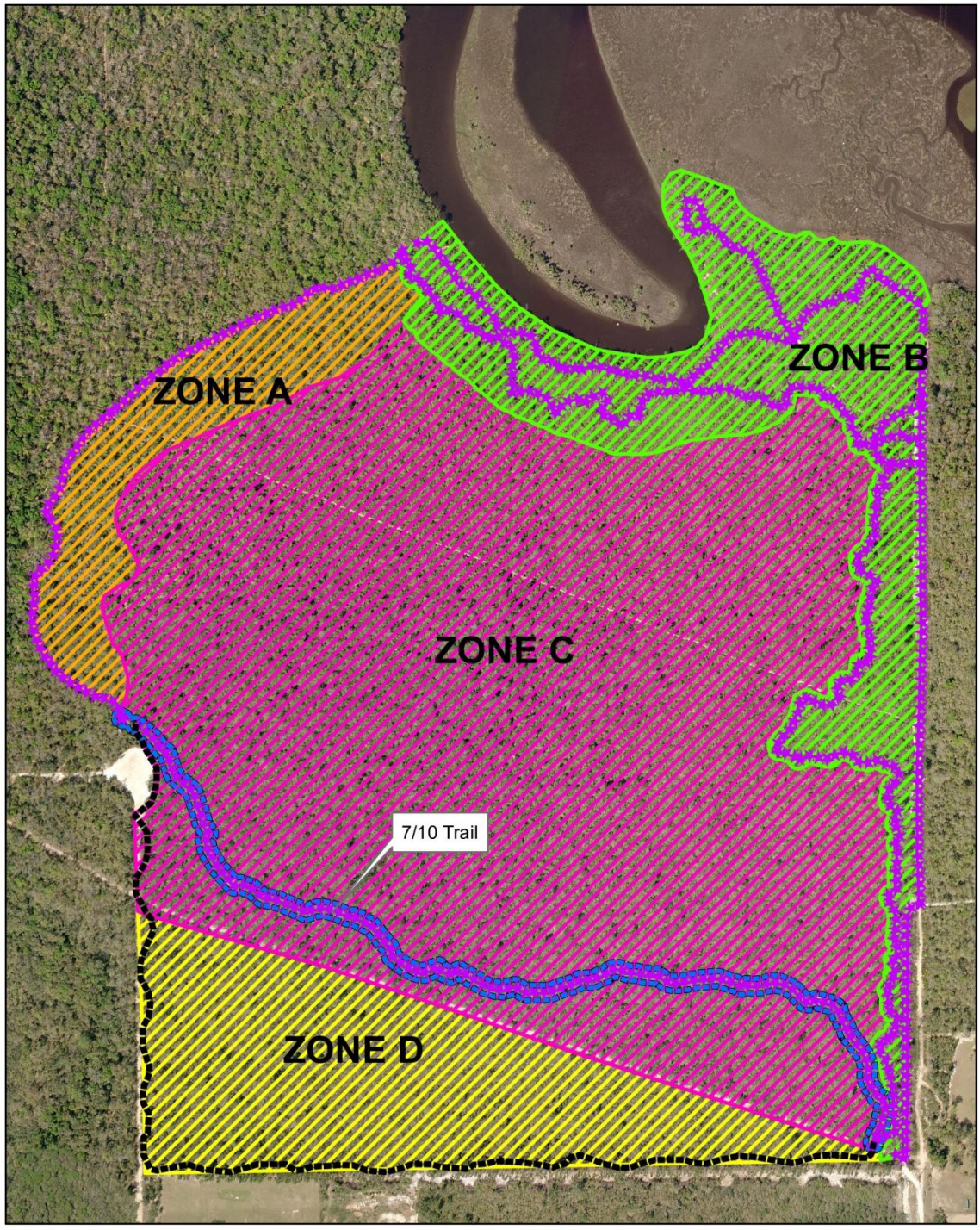
Zone B: Maintain the existing vegetation throughout a buffer that is at least 300 feet from the Spruce Creek bluff on the north and at least 25 feet along the south and west of the trail.

Zone C: Relocate the "7/10 Trail" to the bottom of Zone D and eventually remove the trail through Zone C. Continue use of the "7/10 Trail" with buffers of 25 ft. on both sides during the construction of the new trail, leaving vegetation of less than 15 ft. in place. The remainder of Zone C will be roller chopped. During the restoration, portions of this trail may be closed for public safety.

Zone D: Establish a new trail at the southern border of the property to replace the "7/10 Trail" and meet the recreational needs of users.

Zones C and D will be treated with prescribed fire within one year.

Doris Leeper Spruce Creek Preserve



Legend

- Existing Trails
- Proposed New Trail (to Ultimately Replace the 7/10 Trail)
- 25-Foot Buffer on Either Side of the 7/10 Trail, Leaving Vegetation Less Than 15 Feet in Height
- Zone A (Variable Width; Minimum 50 Feet; No Vegetation Removal)
- Zone B (Minimum 300 Feet from Bluff; No Vegetation Removal)
- Zone C; Scrub Restoration
- Zone D; Scrub Restoration

Map Date: November 6, 2012