# Lake George Conservation Area



Land Management Plan November 2011 Governing Board Approved

#### Lake George Conservation Area Land Management Plan Summary

#### Management Area Size: 11,794 acres

**Date of Acquisition**: Acquisition of parcels within Lake George Conservation Area began March 29, 1990.

Date of Plan:	September 2011
Date of Previous Plan:	March 2006
<b>Basin:</b> Lake George	Basin Planning Unit: Lake George

**Location**: Lake George Conservation Area is located west of US Highway 17, in both Putnam and Volusia Counties. County Road 308 is located just north of the property, while County Road 305 is located along a portion of the conservation area's southern boundary.

**Funding Source**: Lake George Conservation Area was purchased using multiple funding sources including ad valorem, Save Our Rivers funds, Preservation 2000, Florida Forever, and mitigation donation

#### Management Partners:

- The District is lead manager for the Lake George Conservation Area.
- The District has entered into an agreement with the Florida Fish and Wildlife Conservation Commission (FWC), the Board of Trustees of the Internal Improvement Fund (TIITF), Volusia County, and the Florida Forest Service (FFS) designating four separate properties as a single Wildlife Management Area (WMA; the Lake George Wildlife Management Area. Activities associated with public hunting in this WMA fall under the jurisdiction of the FWC.

#### **Key Resource Issues:**

#### **Resource Management Issues:**

- WATER RESOURCES Most water resource protection was accomplished through acquisition, however, at the time of acquisition, runoff from various sources was influencing water quality within Lake George. Additional alterations to water resources include roads, ditches, bridges, culverts, and silvicultural bedding.
- FIRE MANAGEMENT Implementation of prescribed burns occurs in accordance with annual burn plan and individual unit prescriptions.
- FOREST MANAGEMENT Prior to public acquisition, the majority of the upland acres within the conservation area were managed for commercial silviculture. The District will utilize a combination of harvesting, mechanical vegetation management, herbicide treatments, and prescription burning to encourage optimal forest health.

- WILDLIFE The conservation area provides habitat for numerous wildlife species including the Florida gopher tortoise (*Gopherus polyphemus*), Bald Eagle (*Haliaeetus leucocephalus*), and Florida black bear (*Ursus americanus* floridanus.)
- EXOTICS Invasive exotic pest plant and animal species occur on the property at low to moderate levels of infestation. The District regularly monitors for the presence of invasive plants and animals and responds with appropriate control action.
- CULTURAL & ARCHEOLOGICAL RESOURCES A review of the Department of State, Division of Historical Resources indicates there are no Florida master site locations within the boundaries of the conservation area.

**Key Land Use/Recreation Issues:** The entire conservation area is open to the public with recreational opportunities for hiking, biking, primitive/group camping, equestrian activities, wildlife viewing, fishing, and seasonal hunting. While there is not public boat launch within the conservation area, recreational users may access the conservation area from Lake George.

Land Use Management Issues:

- ACCESS Two public access points and five drive-in locations provide recreational access to the conservation area.
- RECREATION USE The conservation area is open for public recreation. The District has developed and implemented a marked trail system as well as a self-guided auto drive.
- SECURITY Maintenance of fence lines, parking areas, gates, and locks is conducted as necessary. The District coordinates with the onsite security resident, local law enforcement, and a private security firm for security needs.

Administration:

- ACQUISITION The District may consider purchasing parcels near the LGCA that become available and that will aid in the conservation of water resources within the Lake George basin. The District may pursue acquisition of small parcels and in holdings or property exchanges with neighbors to improve and/or provide additional access to the conservation area.
- COOPERATIVE AGREEMENTS, LEASES, EASEMENTS AND SPECIAL USE AUTHORIZTIONS (SUA) –
  - Agreements, leases, and SUAs relative to the conservation area include:
    - An intergovernmental agreement with the US Navy.
    - An SUA for organized SOLO camping through Outward Bound.
    - A lease agreement for the exchange of grazing area for horse use.
    - A intergovernmental lease for the Lake George WMA
    - An employee residence agreement.
    - An SUA for fox scent hunt activities.
    - An SUA for saw palmetto frond harvesting.
    - An SUA for apiary sites.

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# INTRODUCTION

This document provides guidelines for land management activities to be implemented at Lake George Conservation area (LGCA) over the next ten years. This is a revision of the land management plan approved in March of 2006.

LGCA includes approximately 11,794 acres within the Lake George Basin. The property is located in Volusia and Putnam Counties, along the northeast shore of Lake George. The conservation area provides protection for approximately 3.5 miles of the Lake George shoreline. Lake George is the St. Johns River's largest lake with a surface are of ~46,000 acres, and ranks as the second largest lake in the State of Florida.

The conservation area is located immediately west of US Highway 17 and is bound to the west by Lake George. County roads 308 and 305 border the property near its northern and southern boundaries, respectively. Truck Trail 2 is a District-maintained north-south thoroughfare that bisects the property. Harris-Fish Camp Road is a County-maintained road that crosses the property. Numerous secondary roads cross the conservation area. These named roads include:

- o Barrs Road
- Denver Road
- Combie Road
- Jumping Gully Road
- Middle Road
- Truck Trail 1
- Aces Road
- Silver Pond Road
- Cory Road

The property is located within several Sections of Township 8 South, Ranges 29 and 30 East. Figure 1 is a 2009 aerial image of the property and Figure 2 depicts the location of the conservation area.

The acquisition of the parcels that comprise the LGCA provide for the protection of important water resources and ecological functions. This acquisition is consistent with the goals of the Lake George Basin projects set forth in the District's Land Acquisition and Management Five Year Plan, and the District's Water Management Plan, which were in place during the acquisition of the parcels within the conservation area. These goals are to:

- Improve water quality, maintain natural hydrologic regime, and maintain flood protection by preserving important wetland areas.
- Restore, maintain, and protect native natural communities and diversity.
- Provide opportunities for recreation where compatible with the above listed goals.





# **CONSERVATION AREA OVERVIEW**

#### **Regional Significance**

The LGCA is a significant acquisition providing linkage between a broad network of publicly owned lands and conservation easements in Volusia, Putnam, and Marion Counties and surrounding areas. Figure 3 illustrates the regional significance of the conservation area. Public conservation lands that are contiguous or in close proximity to the LGCA include:

- o Lake George Forest
- Lake George State Forest
- Ocala National Forest
- Heart Island Conservation Area
- o Crescent Lake Conservation Area
- o Haw Creek Preserve State Park
- o Welaka State Forest
- Dunns Creek State Park
- o Dunns Creek Conservation Area
- o Caravelle Ranch Wildlife Management Area
- o Clark Bay Conservation Area
- o Lake Woodruff National Wildlife Refuge
- o Tiger Bay State Forest

#### **Acquisition History**

The LGCA is comprised of seven (7) parcels, totaling 11,794 acres (Figure 4.) The following properties were purchased using funding sources as indicated and were incorporated into the conservation area as they were acquired. Table (1) one summarizes the land acquisition accomplishments.

*Union Camp Parcel A – 10,777 acres - Land Acquisition number 1988-019-PA* 

The District contributed to the purchase of 18,635 acres from Union Camp on March 29, 1990. Of that total, 10,777 acres (LA# 88-19a) were purchased solely by the District for a price of \$7,651,624.00. Bond 89/ Save Our Rivers funds were used for the purchase. This portion of the acquisition is incorporated into the Lake George Conservation Area.

Additionally, as part of this acquisition, the District and Volusia County coordinated efforts to purchase an additional 7,858 acres (LA# 88-19b) within the conservation area. The District contributed \$1,874,458.00 in ad valorem funds to the purchase, while Volusia County contributed \$3,748,917.00 to the purchase. Volusia County retains a 2/3 ownership in the land and timber within this parcel, and is the designated lead manager of the parcel (also known as Lake George Forest).

Additionally, the District acquired several additional parcels, accomplishing a physical connection between the two larger Union Camp parcels.





Parcel	LA Number	Acres	Total Purchase Price	Closing Date	District Funding Source
Union Camp – Parcel A	1988-019-PA	10,777	\$7,651,624	3/29/1990	SOR/BOND89
Dorado	1989-024-P1	677	\$725,000	11/21/1990	SOR/BOND89
FPC-Patience Purvis	1990-039-P1	47		10/25/1991	Mitigation
Gladys P. Stone	1990-038-P1	81	\$137,166	4/15/1992	P2000
Crawford, Jewell P.	1990-040-P1	91	\$154,095	4/15/1992	P2000
Union Camp – Parcel A	1988-019-PA	(70)		2/13/2006	Exchange
Compton	2004-024-P1	81		2/13/2006	Exchange
Harris, Keith M.	2005-025-P1	110	\$385,000	6/28/2006	Ad Valorem
TOTAL		11,794	\$9,052,885		

Table 1 – Land Acquisition Summary

Dorado – 677 acres – Land Acquisition Number 1989-024-P1 This parcel was acquired by the District on November 21, 1990 for \$725,000 using SOR/BOND 89 funds.

- FPC Patience Purvis 47 acres Land Acquisition Number 1990-039-P1
   The FPC Patience Purvis parcel was acquired on October 25, 1991 through mitigation donation.
- Gladys P. Stone 81 acres Land Acquisition Number 1990-038-P1 The Gladys P. Stone parcel was acquired on April 15, 1992 for \$137,166 using P2000 funds.
- Crawford, Jewell P. 91 acres Land Acquisition Number 1990-040-P1 The Crawford, Jewell P. parcel was acquired on April 15, 1992 for \$154,095 using P2000 funds.

Compton – 81 acres – Land Acquisition Number 2004-024-P1 Union Camp Exchange – (70 acres) – Land Acquisition Number1988-019-PA Approximately 70 acres of the Union Camp parcel were exchanged for approximately 81 acres of neighboring land. Prior to the exchange, the Compton/ Harris property was utilized as a shooting range and was inaccessible to its owners without traversing Lake George Conservation Area. In order to remedy this, both parties agreed to a property exchange. The exchange was valued at \$92,800. Additionally, the District reserved the right to harvest timber from the Union Camp parcel through February of 2007.

Harris, Keith M. – 110 acres – Land Acquisition Number 2005-025-P1
The Harris, Keith M. parcel was acquired on June 29, 2006 for \$385,000 using AdValorem funds.

#### Local Government Land Use Designation

#### Putnam County

Land Development Code

Under Putnam County's current land development code, the lands within Lake George Conservation Area are listed as Agriculture. The primary purpose of the Agriculture zoning (AG) district is to implement the Agriculture I and Agriculture II land use classifications shown on the Putnam County Future Land Use Map.

#### Future Land Use

The portions of Lake George Conservation Area that are located within Putnam County fall under one of two separate future land use classifications: "Agriculture II" or "Conservation."

The Conservation land use category depicted on the Future Land Use Map includes areas designated for the purpose of conserving or protecting natural resources including ground water, surface water, wildlife habitats, vegetative communities, floodplains, and wetlands. The purpose of the Conservation zoning district is to implement the Conservation future land use classification shown on the Putnam County Future Land Use Map.

Use categories and certain uses allowed in the Conservation district: (a) On Public and Semi-Public Lands the residential use shall be limited to caretaker/security residence only. All other residential uses prohibited. (b) Privately-owned lands shall not be designated Conservation district except by application of the landowner and in such case shall be limited to a maximum density of 1 dwelling unit per 30 acres.

- Resource based recreation. Non-residential uses limited to public or private facilities providing for resource-based recreation and education shall be allowed in the CON district.
- Primitive campgrounds

Development shall be limited to 5 percent impervious surface area on the site. All new non-residential uses in the Conservation district shall be approved by a special use

permit, which shall not be issued unless the location, intensity, and all other aspects of the proposed use are found to be consistent with the objectives and policies for the Conservation land use classification in the Putnam County Comprehensive Plan.

The Agriculture II land use category depicted on the Future Land Use Map consists of areas which are primarily used for silviculture, rangeland, and other agricultural uses. Also within this area are vacant land and residential parcels of land, some of which exceed the density allowed in this future land use category. It is intended that a large share of this land will remain in active agricultural. In addition to agricultural uses, future development in the Agriculture II land use category shall be allowed as follows:

- Intensive agricultural uses are permitted and shall be further regulated by standards provided in the land development code. Activities must comply with best management practices.
- Residential development shall be limited within a maximum density
  - Range of 1 dwelling unit per 20 acres to 1 dwelling unit per 10 acres. Housing types and lot sizes are subject to further regulation by residential zoning district standards provided in the land development code.

#### Volusia County

The portion of Lake George Conservation Area that is located within Volusia County is listed as "Conservation" under the county's future land use classification code. It is intended that the Conservation classification be applied to certain lands, which are either owned or controlled by a governmental agency, but it may be applied to privately owned lands upon request of the owner. It is the purpose of this classification to protect and preserve:

- Parks, recreation or similar areas
- Historic or archaeological sites
- Fishing, wildlife, or forest management areas
- The natural environment of other selected public lands such as well fields
- Any other unusual or unique feature or areas such as governmentally designated canoe trails, wild or scenic watercourses.

Permitted principal uses and structures include, but are not limited to: aquatic preserves; communication towers not exceeding 70 feet in height above ground level; fishing, hunting, forest and wildlife management areas; historical or archeological sites; and parks and recreation areas.

# NATURAL RESOURCES OVERVIEW

## **Topography and Hydrology**

The Lake George Basin consists of the St. Johns River drainage area from the mouth of the Wekiva River to the mouth of the Ocklawaha River. The basin is located in portions of Volusia, Lake, Marion, and Putnam counties. Lake George is a flow-through lake located within the St. Johns River and is the second largest lake in Florida with a surface area of  $\sim$ 46,000 acres.

The general quality of surface waters in the Lake George Basin is fair. The water resources are categorized as Class III waters by the state. Recreation as well as propagation and maintenance of healthy fish and wildlife populations are identified as the major uses in this classification. Deterioration in the area's water quality is due in large part to eutrophic conditions, while a decrease in water quantity is due to alterations in the landscape upstream of the basin.

The geomorphic features known as the Crescent City Ridge and the St. Johns River Offset provide the topographic foundations for the southeastern portion of Putnam County. The Crescent City Ridge forms an upland backbone for the area between Lake George and Crescent Lake, while the St. Johns River Offset is the foundation for the lower lying regions that are part of the Lake George Conservation Area.

Elevations within the conservation area range from just 5 to 60 feet above mean sea level. The lowest elevations are found along the shore of Lake George. Though wetlands are scattered across the landscape, the shoreline areas support the highest concentration of wetlands within the conservation area. Other wetland areas occur as isolated wetlands, around ponds and lakes, and along small watercourses- such as Jumping Gully Branch, Patty Wiggins Branch and Tiger Branch- that ultimately drain into the lake. Highest elevations within the property are located on the easternmost side of the conservation area. Figure 5 depicts the hydrologic features of the LGCA and surrounding area.

#### **Natural Communities**

The 11,794 acres that comprise the LGCA consist primarily of mesic flatwoods, wet flatwoods, and floodplain swamp (Figure 6). Table 2 details the percent coverage associated with each natural community documented within the conservation area. Information relative to the natural communities within the conservation area is derived from several sources including timber stand assessments and personal observations of District staff. Additionally, the general natural community descriptions are characterized using descriptions published in the Florida Natural Areas Inventory's (FNAI) *Guide to the Natural Communities of Florida*. Natural community and species ranking definitions are listed in Addendum 1.

#### Pine Flatwoods

Flatwoods communities typically occur in low areas with little topography and may be further classified as wet, mesic, or scrubby. All three variants of flatwoods occur within the LGCA. Alterations from past management activities, hydrologic disturbances, and prolonged absence of fire make distinguishing wet and scrubby flatwoods within mesic areas difficult. Natural community reclassification and refinement may occur as restoration and fire management activities progress.

#### Mesic Flatwoods (5,443 acres)

Soils that support mesic flatwoods communities are generally poorly drained, acidic, and sandy soils deposited on ancient, shallow seabeds. Many flatwoods communities have a





from rising, creating dry, droughty conditions. The presence of the hardpan translates to extreme seasonal fluctuations in the amount of water available to support plant life. These seasonal hydroperiods are essential in the maintenance of the flatwoods system.

Natural Community Type	Acreage	Percent Coverage	FNAI Ranking	FNAI Fire Return Interval*	
Floodplain Swamp	1,487	12%	G4/S4	This is not a fire adapted community	
Basin Swamp	1,195	10%	G4/S3	Infrequent – edges may burn with adjacent communities	
Dome Swamp	333	2%	G4/S4	3-5 years along the outer edges (or as adjacent communities burn); 100-150 years interior	
Depression Marsh	148	1%	G4/S4	This community burns with adjacent communities	
Basin Marsh	80	<1%	G4/S3	This community burns with adjacent communities and as hydrologic conditions permit.	
Flatwoods Lake	114	1%	G4/S3	Infrequent – edges may burn with ecotones and adjacent communities	
Wet Prairie	4	<1%	G2/S2	2-3 years	
Sandhill Upland Lake	5	<1%	G3/S2	Grassy edges will burn in conjunction with adjacent communities	
Bottomland Forest	273	2%	G4/S3	This is not a fire adapted community	
Wet Flatwoods	1,507	13%	G4/S4	1-3 years in grass dominated systems; 5-7 years in shrubbier systems	
Mesic Flatwoods	5,443	46%	G4/S4	2-4 years	
Scrubby Flatwoods	693	6%	G2/S2	5-15 years	
Sandhill	83	1%	G3/S2	1-3 years	
Scrub	211	2%	G2/S2	8-15 years for oak dominated; up to 40 years in sand pine systems.	
Xeric Hammock	12	<1%	G3/S3	Site specific	
Subtotal	11,518			-	
Altered Land Types	Acreage	Percent Coverage		Fire Return Interval	
Improved Pasture	150	1%		1-3 years; as needed, or in conjunction with adjacent areas.	
Borrow Pit	2	<1%			
Successional Hardwood Forest	54	<1%		In conjunction with adjacent pyric plant communities.	
Subtotal	206				
Total	11,794				

Table 2 – Natural Community Coverages

\*Stated FNAI fire return intervals are based on regional differences in communities and fuel loading. The District will target the lowest interval possible that will effectively carry fire.

Intact or well-maintained mesic flatwoods typically have a layered appearance, with a distinct, high, discontinuous canopy, low shrub layer, and diverse herbaceous layer. The canopy densities are variable and may include (depending on location) longleaf pine (*Pinus palustris*), slash pine (P. *elliottii*), loblolly pine (*P. taeda*), or pond pine (*P. serotina*). The shrub layer may include a mixed palate, or be dominated by, species such as saw palmetto (*Serenoa repens*), wax myrtle (*Myrica cerifera*), and numerous members of the Ericaceae family. The herbaceous coverage may be dominated by wiregrass, however species abundance and diversity is often dictated by the openness of both shrub and canopy layers.

Most of the mesic flatwoods communities within the conservation area are in pine plantation; primarily slash pine. While many of these areas retain site appropriate species, they are beginning to exhibit successional changes resulting from a prolonged absence of fire. Successional changes evident include an overgrown shrub layer, and in some areas, suppressed groundcover. Silvicultural bedding is an additional disturbance within some of the mesic flatwoods.

In addition to seasonal hydroperiods, fire is an important physical factor associated with the shaping and maintenance of this community type. Natural fire return intervals in mesic flatwoods are approximately every two to four years. Fires in well-maintained mesic flatwoods tend to burn quickly and at relatively low temperatures. In areas of prolonged fire exclusion, altered hydrology, or hardwood encroachment, higher soil and fuel moistures may require more extreme conditions to facilitate a fire, causing fires to be more catastrophic in nature.

#### Wet Flatwoods (1,507 acres)

Soils that support wet flatwoods are generally very poorly drained sandy soils that may have a mucky texture in the upper horizons. Wet flatwoods occur as ecotonal areas between the drier mesic flatwoods and wetter areas including swamps. They may also occur in broad, low flatlands embedded within these communities.

Well-maintained wet flatwoods exhibit a relatively open-canopy forest of scattered pine trees (longleaf, loblolly, slash, or pond) or cabbage palms (*Sabal palms*) with either a sparse or absent midstory and a dense groundcover of grasses, herbs, and low shrubs. Understory species of the sub canopy and shrub layers may include sweet bay (*Magnolia virginiana*), loblolly bay (*Gordonia lasianthus*), and saw palmetto. The groundcover layer may include species such as wiregrass, blue maidencane (*Amphicarpum muhlenbergianum*), and numerous hydrophytic species. The variation in structure and composition may be attributed to subtle edaphic differences as well as hydrologic and fire regimes.

Many of the wet flatwoods within the conservation area exhibit signs of successional changes likely due to the prolonged absence of fire and altered hydrology. In many areas, these changes include the proliferation of species such as loblolly bay. Additionally, these altered regimes have created conditions where hardwoods are expanding into the adjoining mesic flatwoods.

The wet flatwoods community is fire dependant with return intervals ranging from one to three years in grassy systems and five to seven years in shrubbier systems. In areas such as the LGCA, an overgrown sub canopy tends to occur within the wet flatwoods where fire has been either low in intensity or absent. Wet flatwoods within the conservation are suffer from an elongated fire return interval and are heavily overgrown.

#### Scrubby Flatwoods (693 acres)

Scrubby flatwoods communities generally occur on moderately well drained, sandy soils. This community type occurs on slight rises within surrounding mesic flatwoods and may occur as broad transitional or ecotonal areas. Standing water is uncommon in scrubby flatwoods as the depth to the water table is generally greater than the adjacent mesic flatwoods.

Scrubby flatwoods have a stratified appearance and are characterized as an open canopy forest of widely scattered pine trees with a shrubby understory and numerous areas of barren white (usually) sand. The vegetation in these important ecotonal areas is a combination of mesic flatwoods and scrub species. In areas where scrubby flatwoods grades into sandhill, vegetation typical of that community may also be present. Canopies of the scrubby flatwoods in northern and central Florida may include longleaf or slash pine. Shrub layers will often include several species of xeric oaks (Chapman's, sand live, and myrtle), saw palmetto, and various Ericaceous plants. Groundcover, while generally very sparse, may include wiregrass.

Scrubby flatwoods communities within the LGCA vary in levels of disturbance. Across the conservation area, numerous alterations including fire exclusion, conversion to sand pine, and site preparation treatments that reduced the coverage of site appropriate shrub layer species have occurred within these areas. Many of these alterations occurred prior to public acquisition or as a result of site conditions that were present at the time of acquisition.

Fire is an integral component in the perpetuation of this community type. The open areas of bare sand, sparse groundcover vegetation and coverage of largely incombustible oak leaf litter typical of most scrubby flatwoods results in a fire return interval of between 5 and 15 years. Scrubby flatwoods with a higher herbaceous or saw palmetto coverage may burn more frequently. The presence and distribution of certain plants within the scrubby flatwoods indicates the presence of other plant communities (scrub, sandhill). As fire management is implemented within these areas, the extent of scrubby flatwoods xeric habitats will be refined.

#### Scrub (211 acres)

Scrub is characterized as a community composed of evergreen shrubs, with or without a canopy of sand pine. Scrub systems are found on dry, infertile sandy ridges. Soils that support these systems are low-nutrient acid sands with little organic matter.

There are three recognized variants of scrub: oak scrub, rosemary scrub, and sand pine scrub. All three variants include areas of exposed bare sand and exhibit sparse groundcover assemblages. A matrix of oak scrub and sand pine scrub occur within the conservation area.

- The most common form of scrub across the State is oak scrub, which is dominated by myrtle oak, sand live oak, and Chapman's oak. Oak scrub also includes some saw palmetto and rusty staggerbush and may include some sand pine and rosemary. While disturbed from past silvicultural activities, much of the oak scrub within the conservation area retains many of the signature species of the oak scrub system. Shrub heights in these areas range from approximately 3 feet to 9 feet. These areas includes large areas of barren sand and numerous active gopher tortoise burrows.
- Sand pine scrub is dominated by a canopy of sand pine that may range from widely scattered trees with a short, spreading growth form, to tall thin trees that form a dense canopy. The sand pine scrub understory may include the suite of characteristic scrub oaks and/or rosemary. The scrub systems that have not been manipulated include a sand pine canopy within the conservation area tend to have a moderate to heavy coverage of sand pine and the trees tend to be shorter and exhibit the more spreading growth form. The areas that have been harvested have tended to support tall, thin sand pine in higher densities. The understory includes scrub oaks, sparse saw palmetto, and rusty staggerbush. Shrub heights in these areas range on average ~6 to 9 feet. Some areas include shrub heights that exceed 9 feet and area succeeding to hammock.

Scrub communities are fire maintained and generally burn catastrophically every 5 to 40 years. The high variability of fire intervals within scrub systems is relative to the productivity of the site (Myers, 1990). Highly productive sites will have a lower return interval. Maintaining the lower fire return interval will result in an oak scrub system with fewer sand pines. A longer fire return interval will allow for a sand pine dominated system in areas where sand pine is present. Scrub is globally imperiled, according to FNAI, due to the relative rarity of occurrence and vulnerability to extinction.

#### Floodplain Swamp (1,487 acres)

Floodplain swamp communities typically occur on flooded soils along stream channels and within river floodplains. The floodplain swamp communities within the conservation area are associated with Lake George, Patty Wiggins Branch, Jumping Gully Branch, and Tiger Branch.

Soils that support floodplain swamp communities are variable, but may include a mixture of sand, organic, and alluvial material. Peat soils may be present in floodplain swamps associated with smaller streams and branches or in areas of low stream velocity. The most important physical factor associated with the shaping and maintenance of the floodplain swamp is the hydroperiod. Extended periods of inundation, which may last

for most of the year, are common in the floodplain swamp environment. Alterations to the hydrology within the floodplain swamp, particularly a reduction in the duration of inundation periods may have damaging consequences to the system and associated flora and fauna. Since this community type is maintained by hydrologic regimes, it is not fire dependent.

The functionality of floodplain swamps across the LGCA is largely intact. Notable physical alterations to this community include road/bridge crossings. Typical of the floodplain swamp system, the examples of this community type within the conservation area include a closed-canopy forest of hydrophytic, buttressed trees including bald cypress (*Taxodium distichum*) and water tupelo (*Nyssa aquatica*).

#### Basin Swamp (1,195 acres)

Basin swamps are large irregularly shaped basins that are thought to have developed in oxbows of former rivers or in ancient coastal swales and lagoons that existed during higher sea levels. Soils that support basin swamp communities are acidic, nutrient-poor peats often overlying a clay lens or other impervious layer. This clay lens or impervious layer may cause a perched water table above that of the adjacent uplands, causing standing water for most of the year. While basin swamps are not associated with rivers, they may contain streams and sloughs that flow during periods of high water.

The majority of the basin swamps within the LGCA are located in the northern half of the property. Basin swamps have a typical hydroperiod of approximately 200-300 days and though infrequent, fire is essential for the maintenance of these natural communities. Fire return intervals in basin swamps are variable, but necessary to restrict peat accumulation and the expansion of hardwoods into adjacent communities. The edges of basin swamps may be exposed to frequent fire, often burning in concert with surrounding natural communities.

#### Dome Swamp (333 acres)

Dome swamp communities typically occur embedded within well-maintained pyric plant communities such as flatwoods. The dome swamp communities within the conservation area occur within the flatwoods, pine plantations, and improved pastures and are altered from the silvicultural and ranching activities.

Dome swamps are typically found on flat terraces, where they develop when the overlying sand has slumped into a depression in the limestone underlayment. Soils that support dome swamp communities are variable, but may include a layer of peat that thickens towards the center. The peat layer is typically underlain with acidic sands or marl and then limestone or a clay lens. An important physical factor associated with the shaping and maintenance of the dome swamp is the hydroperiod. Water levels in dome swamps fluctuate seasonally with rainfall changes. Normal dome swamp hydroperiods are from 180 - 270 days per year.

Typical of the dome swamp system, the examples of this community type within the conservation area include a dome shaped profile created by the presence of smaller trees growing in the shallow waters of the outer edge with the large trees growing in the deeper center. The canopy of hydrophytic trees includes pond cypress (*Taxodium ascendens*) and water tupelo. Herbaceous components of dome swamps within the conservation area include Carolina redroot (*Lachnanthes caroliana*), smartweed (*Polgonum densiflorum*), and various grasses, sedges, and rushes.

Without frequent fire, cypress may become less dominant, being replaced by hardwood or bay species and may exhibit an increase in peat accumulation. Fire frequency within these communities is greatest around the edges. The longer hydroperiods within the center of most dome swamps will restrict the advance of most fires under normal conditions. Thus, the fire return interval for dome swamps may range from 3 to 5 years along the outer edges and may be as great as 100 to 150 years in the center.

#### Bottomland Forest (273 acres)

Bottomland forests are found throughout Florida, may be associated with blackwater floodplains, and may be located between the swamps and uplands communities. The bottomland forest communities within the conservation area include a narrow ribbon in the western portions of the property and are associated with the floodplain swamps along Jumping Gully Branch. The areas delineated as bottomland forest are disturbed. It is important to note that these areas exhibit species compositions and general landscape locations that are best described by bottomland forest but that these areas overtime, and with restorative management practices, may be reclassified.

Where this community occurs in the central portions of the state, soils are intermediate and may include a mixture of sands, clay, and organic materials. Some examples of bottomland forests (like the ones at LGCA) occupy areas between the floodplain swamps and uplands. The most important physical factor associated with the shaping and maintenance of the bottomland forest is the hydroperiod. The water table in these areas is high; however, inundation in these areas is generally restricted to periods of high flooding. Since this community type is maintained by hydrologic regimes, it is not fire dependent.

The bottomland forests within the conservation area include plant species, typical of this community type. These plants include many disturbance adapted, wetland pioneer species such as sweetgum (*Liquidambar styraciflua*), red maple (*Acer rubrum*), and loblolly bay (*Gordonia lasianthus*). Other plant species present, include loblolly pine, laurel oak (Quercus laurifolia), and American hornbeam (*Carpinus caroliniana*).

#### Basin Marsh (80 acres)

Basin marshes are herbaceous or shrubby freshwater wetlands in large irregularly shaped basins. These marshes typically develop in large solution depressions that were formerly shallow lakes and may also be located within non-pyrogenic plant communities. Plant

species compositions can be divided into submersed, floating-leaved, emergent, and grassy zones.

Seasonal hydroperiods and longer-term fluctuations are essential to the maintenance of this natural community as is frequent fire. The fire return interval for basin marshes is dependent on the hydrology of the marsh and the exposure to fire from surrounding communities. Hydrologic alterations and fire exclusion have caused some of the basin marshes within the conservation area to become heavily encroached by shrub species such as titi (*Cyrilla sp.*), a native, but often weedy species.

#### Depression Marsh (148 acres)

Depression marsh communities typically occur embedded within a matrix of wellmaintained pyric plant communities including flatwoods. The depression marsh communities within the conservation area occur within the various flatwoods types and pine plantations. Many are altered from the silvicultural activities. Alterations include hydrologic changes and soils disturbances from site preparation techniques such as silvicultural bedding. Additionally, some depression marshes within the conservation area include planted pine.

Depression marshes are typically found on flat landscapes throughout Florida. They develop when the overlying sand has slumped into a depression in the limestone underlayment. Soils are typically depressional phases of fine sands. An important physical factor associated with the shaping and maintenance of the depression marsh is the hydroperiod. Depression marshes are maintained in part against woody shrub invasion by fluctuations in water levels associated with rainfall.

Typical of the depression marsh system, the examples of this community type within the conservation area include concentric bands of vegetation which include species such as Carolina redroot (which often colonizes after soil disturbances), Elliott's yellow-eyed grass (*Xyris elliottii*), and pickerel weed (*Sagittaria lancifolia*). These seasonal ponds are important (habitat) for numerous species of wildlife, but are particularly important for many amphibians that require breeding sites that are free of predatory fish. (Moler, 1987).

Without frequent fire, herbaceous components of the depression marsh systems may give way to woody shrub species. The frequency of fire within these areas is determined by the fire frequency of the surrounding natural community. The depression marshes within the LGCA will have fire return intervals influenced by the fire frequency of the surrounding wet, mesic, and scrubby flatwoods/pine plantations.

#### Sandhill (83 acres)

Sandhills are characterized as a forest of widely spaced pine trees with a sparse understory of deciduous oaks and a dense groundcover of grasses and herbs on rolling hills of sand. The most typical associations are dominated by longleaf pine, turkey oak (*Quercus laevis*), and wire grass.

Sandhills occur on crests and slopes of rolling hills and ridges with steep or gentle topography. Soils are deep, marine-deposited, often-yellowish sands that are will drained and largely infertile.

The sandhill plant community is a fire climax community. Fire is a dominant factor in the ecology of this community and frequent fires are necessary to reduce hardwood competition and to perpetuate pines and grasses. Fire return intervals within sandhill communities range from one to three years. In addition to fire frequency, intensity and season are important fire characteristics that greatly influence the species structure and composition within sandhills. Optimally, sandhills are maintained through frequent, low-intensity, growing season fires. The sandhills within the LGCA are degraded with suppressed groundcover and include a heavy coverage of offsite oaks as well as planted slash pine.

#### Xeric Hammock (12 acres)

Xeric hammock is characterized as an evergreen forest with a low canopy and little understory plants other than palmetto, or a multi-storied forest of tall trees with an open or closed canopy. Several gradations between these extremes may occur.

The xeric hammock natural community is typically an advanced successional stage of scrub or sandhill. It is a climax community, having been protected from fire for 30 or more years. When fire does occur in the xeric hammock, it is under extreme conditions, burns catastrophically and it may revert the community back to an earlier successional stage. The xeric hammocks within the LGCA are typical as described by FNAI in that they have succeeded from sandhill and scrub.

#### Flatwoods Lake (114 acres)

Flatwoods lakes are characterized as open water bodies surrounded by a dense ring of saw palmetto and other shrubs. The depressions in which these communities develop are typically formed when either solution holes form in the underlying limestone, causing surface sand to slump into a depression, or when, during high sea levels, offshore currents, waves, and winds scoured depressions that became inundated after the seas regressed. Soils in these areas generally consist of acidic sands with some peat accumulation and a clay lens.

Examples of flatwoods lake are located throughout the conservation area. Hydrologic alterations from past silvicultural activities as have altered this community and the surrounding flatwoods. The open water portions of many of these lake systems have diminished since the 1940s and the areas now support a broader coverage of hydrophytic shrubs and trees.

#### Sandhill Upland Lake (5 acres)

Sandhill upland lakes are characterized as shallow rounded solution depressions occurring in sandy upland communities. They are generally permanent water bodies, although water levels may fluctuate substantially, occasionally drying entirely. They are typically lentic water bodies without significant inflows or outflows; water is largely derived from lateral ground water seepage or artesian connections with the underlying aquifer.

Vegetation within the sandhill upland lake community is usually confined to a narrow band along the shore and consists of various species of hydrophytic grasses, herbs, or shrubs. Emergent vegetation may be found in a wider band along the sloping shoreline and may include submerged aquatic vegetation throughout the water column. Additionally, floating plants may cover much of the surface area of the water. The sandhill upland lake is an important habitat for numerous species reptiles, amphibians, fish, and birds.

The sandhill upland lake is not a fire dependant plant community; however, fire may burn into the grassy shoreline.

A single example of the sandhill upland lake is found within the conservation area and is located near the eastern boundary of the property.

#### Wet Prairie (4 acres)

Wet Prairie natural communities are characterized as continually wet, yet not frequently inundated systems that occur on slight slopes. These systems are most often found between mesic flatwoods and lower lying areas including depressions, swamps, and lakes. Soils that support wet prairies are often acidic, nutrient-poor, and sandy soils that may also be loamy or clayey.

Wet prairies are highly biologically diverse communities, particularly with regard to floral species. A dense herbaceous layer dominated by wiregrass (*Aristida sp.*) with a low shrub layer most often dominates these systems, which, in intact systems include various species of St. John's wort (*Hypericum spp.*), and titi.

Fires are an important factor in the shaping and maintenance of wet prairie systems, however, the fire regime is often influenced by hydrologic conditions. The natural fire return interval ranges between 2 - 3 years. In wetter years or in areas where hydrologic disturbances create lengthy periods of saturation, fire return intervals may be longer.

#### Altered Land Types (206 acres)

Altered land types within the conservation area include improved pastures, borrow pits, and successional hardwood forests.

Improved pastures (150 acres) occur in the southern reaches of the conservation area and include a coverage of bahia grass with scattered pockets of various oaks.

A borrow pit (2 acres) occurs along the eastern portion of the property. This area is scraped to bare sand is frequently subject to illegal dumping activities.

Successional hardwood forests (54 acres) are located along the southern portions of the property and are mostly associated with improved pasture areas. These areas are dominated by oak canopies with little vegetation beneath. Due to the level of disturbance and time since the first disturbance, determining the historic natural community coverage is not likely.

#### Soils

According to data produced by the United States Department of Agriculture, Soil and Conservation Service, 35 different soil types are within the LGCA. Figure 7 contains a soils map of the conservation area. The Putnam and Volusia Soil Surveys provided information used to develop descriptions of the predominant soil series found within the LGCA. The soil descriptions are located in Addendum 2.



# PAST MANAGEMENT SUMMARY

This section describes management strategies outlined in the 2006 land management plan and provides the status of each item.

Water Resources 2006 Plan Strategy	Status
Regularly monitor roads, bridges, and trails	District staff monitors roads, bridges, and
for erosion problems.	trails on a regular basis. Since the writing
	of the last plan maintenance has been
	conducted on seven low water crossings
	and eleven culverts have been replaced

Fire Management 2006 Plan Strategy	Status
Develop and implement annual prescribed	District staff have developed an annual
fire plans.	burn plan each year.
Develop an implement comprehensive	A prescribed fire plan was developed in
long-term prescribed fire plan.	2006.
Complete site preparation burns in	District staff conduct site prep burns as
appropriate areas (primarily clearcuts) prior	necessary and when site conditions permit.
to replanting.	
Administer dormant season burns in all	Since the writing of the last plan, District
areas until fuel loads allow the introduction	staff have conducted 3,515 acres of
of growing season burns.	burning, some of which occurred during
	the dormant season.
Continue to conduct dormant season burns	District staff implement dormant season
until fuel reduction goals are met.	burns as necessary.
Implement growing season burns in areas	Since the writing of the last plan, District
that have sufficiently reduced fuels.	staff have conducted 12 burns totaling
	3,515 acres, some of which occurred in the
	growing season.

Forest Management 2006 Plan Strategy	Status
Conduct thinning in planted slash pine	Since 2006, the District has accomplished:
stands. Determine most beneficial type of	• 125 acres of wildfire salvage harvests
harvest for stands.	• 1,086 acres of 1 <sup>st</sup> thinning harvests
	• 942 acres of 2 <sup>nd</sup> thinning harvests
	• 126 acres of sand pine clearcut
	harvests
	• 78 acres of slash pine clearcut harvests
Utilize prescribed fire as a forest	District staff use prescribed fire in
management tool.	conjunction with forest management.
Continue to monitor forested stands for	The District inspects pine plantations and
signs of drought, disease, or insect	other forested areas for disease and insect
infestations.	infestation. Since the writing of the last
	plan, 127 acres were salvaged primarily

	due to wildfire mortality.
Manage scrub and sand pine scrub using	District staff are managing sand pine in
natural regeneration, direct seeding, or	areas where it is believed to have had a
planting if necessary.	natural distribution.

Exotic Species 2006 Plan Strategy	Status
Continue to monitor for invasive plant	Known populations of invasive plant
species and treat as necessary,	species are treated; most are at maintenance
	control levels.

Cultural Resources 2006 Plan Strategy	Status
Document and report any new sites to the	No new sites have been discovered.
Division of Historical Resources.	

Access 2006 Plan Strategy	Status
Maintain roads, trails, and bridges within	Roads are maintained as needed. Since
the conservation area.	2006, 11 culverts were replaced, and seven
	low water crossings received maintenance.
Improve roads for interpretive drive.	Roads were improved and the interpretive
	drive was established in 2010.
Maintain necessary fencing, gates,	District staff have inspected boundaries
boundary markers, and signage within the	and conducted sign maintenance.
conservation area.	
Maintain parking area, restroom facility,	Parking areas were maintained on an
and kiosk near Pine Island Trailhead.	average of twice monthly through a trails
	maintenance contract. Restroom facilities
	are maintained weekly through a service
	contract. District staff maintains kiosks.
Complete construction of and maintain	The office and storage facility was
office and equipment storage facility off	constructed in 2006. District staff conduct
Joe Pittman Road.	routine maintenance as necessary.

<b>Recreation 2006 Plan Strategy</b>	Status
Maintain roads, marked trails, and	District staff conduct road maintenance and
associated brochures with trail map.	trail marking as needed to facilitate
	recreation. Trail maps are updated as
	necessary and available at the kiosk or on
	the District website.
Maintain kiosks and entrance signs	Kiosks and entrance signed were cleaned
	and maintained monthly.
Maintain camping and picnic areas,	Camping areas and picnic areas are
benches, and fire rings.	maintained monthly. Benches, tables, fire
	rings, equestrian mount boxes, pitcher
	pumps are maintained as needed.
Maintain restroom facility near Pine Island	The restroom facility is maintained weekly.
Trailhead.	

Maintain intergovernmental agreement	This agreement designating the County as
with County.	lead manager of the Lake George Forest is
	current.
Maintain agreement designating LGCA a	This agreement is current.
portion of Lake George Wildlife	
Management Area.	
Evaluate the need to install an observation	District staff determined that an
tower within the conservation area.	observation tower was not feasible.
Extend the existing Barrs Landing Loop	The extension of this trail was not
Trail to the Jumping Gully camp area.	accomplished during this planning period.
	It will continue to be considered based on
	need, budget, and staffing availability.
Develop an interpretive auto-drive and a	An interpretive auto-drive brochure is
corresponding trail guide/brochure.	developed; however, revisions are
	expected.

# Environmental Education 2006 Plan StrategyStatusEncourage education opportunities as theyEnvironmental education opportunities

Encourage education opportunities as they	Environmental education opportunities
arise.	have not been presented, however, the
	District does encourage these opportunities.

Security 2006 Plan Strategy	Status
Maintain contract with private security	The security firm contract is current.
firm.	
Continue coordination with FWC.	District staff coordinates with FWC
	regarding security needs as necessary.
Continue to coordinate with on-site	District staff coordinates with security
security resident.	resident as necessary.

Acquisition 2006 Plan Strategy	Status
Pursue acquisition of inholdings.	The Harris parcel was acquired in June
	2006.
Pursue land exchanges with neighbors	No land exchanges have occurred since
when appropriate.	2006.

<b>Cooperative Agreements 2006 Plan Strate</b>	gy Status
Maintain all cooperative agreements.	All cooperative agreements are maintained
	as needed.

# **IMPLEMENTATION**

The following sections outline land management strategies for resource protection, land use, and administration on the conservation area for the next ten years.

## **RESOURCE PROTECTION AND MANAGEMENT**

#### Water Resource Protection

While most water resource protection was accomplished through acquisition, portions of the wetlands and surface water within the conservation area are disturbed. Hydrologic disturbance within the conservation area include roads, ditches, bridges, culverts, borrow pits, canals, and silvicultural bedding.

Roads and associated ditches are located on all parcels within the conservation area and provide access for land management activities and recreational opportunities. The District has made improvements to, and conducted maintenance on, many of these roads and ditches helping to reduce the potential for erosion. Appropriate management of the branches and wetlands across the conservation area will enhance the water quality in Lake George. Figure 8 depicts the location of creeks and branches within the LGCA and surrounding area as well as the location of bridges, culverts, and low water crossings. Table 3 itemizes specific water resource improvement activities conducted since 2006. District staff have identified a wooden bridge located on Cumbie Road that is in poor condition. Subject to funding and applicable permits, this bridge will be replaced within this planning horizon. District staff will continue to inspect roads, trails, low water crossings, bridges, and culverts for erosion problems and maintenance and repair needs.

There are swales/shallow ditches within the improved pasture areas on the southern portions of the property. Some of these ditches appear to be draining the dome swamps within the pastures. These swales/ditches were likely installed to facilitate drainage of the pasture for cattle grazing purposes. District staff will evaluate the site hydrology and determine restoration needs. Restoration work in these areas will be subject to any relevant permit requirements, budget availability, and/or mitigation needs. Additionally, to facilitate silvicultural operations, numerous other ditches and swales were constructed under prior ownership to drain wetlands across the property. Over the longer-term, plugging points (generally at the confluence of roadside ditches) should be identified and the locations incorporated into a hydrologic database for restoration needs and/or mitigation potential and opportunities.

The majority of the acreage within the conservation area is former commercial silvicultural sites and as such, a large portion of those acres were bedded prior to planting. Bedding is a method of site preparation, which includes the construction of a series of linear mounds and alternating trenches designed to improve soil aeration and nutrient concentration on wet and/or nutrient poor sites. Primary objectives of bedding are to elevate seedling root systems out of the water and into the mounds where nutrients are readily available. When possible and when such activities will not produce unacceptable disturbance to existing, desirable groundcover, silvicultural beds will be removed.



Due to the effects of altered hydrology, fire exclusion, and alterations from previous management activities, many historic herbaceous wetlands have been come heavily encroached by shrubs such as titi, wax myrtle, and Carolina willow. District staff will indentify those areas where restoration is feasible, develop a plan, and implement restoration activities targeting historic natural communities identified in the natural communities section of this plan. Restoration activities may include removal of silvicultural bedding, mechanical treatment or herbicide treatment of offsite shrubs, and the reintroduction of prescribed fire. Additionally, depression marshes and other wetland edges will be included in prescribed for the protection, amelioration, perpetuation of the herbaceous wetlands and ecotonal areas.

Date	Structure ID	Туре	Activity
	LG25		Replaced culverts damaged by fire
August 2011	LG27	Culverts	equipment during wildfire
	LG32		suppression.
December 2010	LG56	Low Water	Ballast rock added to stabilize
		Crossing	crossing.
June 2010	LG61	Culvert	Replaced existing, deteriorated
Lune 2010	LC57	Low Water	Pea gravel added to stabilize
June 2010	LG57	Crossing	turnouts to prevent erosion
July 2000	L C01	Culvert	Replaced
July 2009		L ou Water	Replaced Pallast rock added to stabilize
May 2009	LG02	Crossing	crossing
August 2008		Culvert	Replaced
August 2000	LG07	Curvent	Keplaceu
April 2007		Culverts	Replaced
7 pm 2007	LG05	Curvents	Replaced
			Ballast rock added to stabilize
October 2007	LG10	Low Water	crossing and turnouts and water
	Crossing	Crossing	bars installed to prevent erosion.
	LG16		
M 1 2006	LG17		
March 2006	LG18	Culverts	Replaced
	LG19		
	LG31		
December 2006	LG35	Low Water	Ballast rock added to stabilize
December 2000	LG36	Crossings	crossing.
	LG43		
September 2006	LG63	Culvert	Replaced (and concrete drive
September 2000	1005		subsequently installed)

Table 3 – Water Resource Improvements

#### Water Resource Strategies

#### **General Maintenance Activities**

- Conduct maintenance and incidental or emergency repair of water resource structures as necessary.
- Maintain water resource structures database and incorporate maintenance, repair and any new culverts, crossings, or bridges.

#### **Specific Strategies**

#### Recurrent

• Visually inspect roads, trails, low water crossings, bridges, and culverts for erosion problems and maintenance and repair needs.

Short-term Planning Horizon (1-5 years)

- Identify and map firelines located in ecotonal areas that can be rehabilitated and incorporated into fire management activities.
- o Identify restoration needs of shrub encroached herbaceous wetlands.
- Implement restoration activities in shrub encroached herbaceous wetland.
- Locate and GPS the extent of the shallow ditches and swales within the improved pastures. Upload ditch/swale GPS locations to permanent GIS database.
- Determine restoration needs and feasibility of the ditches and swales within the improved pastures.
- Conduct hydrologic restoration of ditches and swales within the improved pastures.

Long-term Planning Horizon (5-10 years)

- Replace wooden bridge on Cumbie Road.
- Identify and map locations of shallow ditches/swales that are connecting and draining isolated and/or ephemeral wetlands within the flatwoods and incorporate into regional database for restoration needs or mitigation potential and opportunities.

#### Flora and Fauna

The conservation area has a diverse assemblage of natural communities providing significant habitat for a variety of floral and faunal species.

The Florida black bear, listed by the State of Florida as a Threatened species, is documented within the LGCA. In addition to habitat loss and fragmentation and a host of diseases and parasites, threats to the bear include human caused mortality and incompatible habitat management. Human caused mortality typically includes illegal killing, euthanasia performed on nuisance bears, and roadkill (Draft Black Bear Management Plan for Florida - Ursus americanus floridanus, 2008). The majority of the conservation area lies within the primary range for the St. Johns subpopulation of the black bear and the northeastern most extent of the property falls within the secondary range of the same subpopulation. Bears are known to utilize the area and road killed animals have been documented on highways in close proximity to the conservation area. To the extent that issues relate to District managed lands, District staff will coordinate as necessary with the FWC, the Florida Department of Transportation (FDOT), and other

relevant parties regarding the management of bear habitat and the facilitation of movement across the landscape.

The conservation area lies within the core foraging area for a nesting colony of the federally endangered wood stork (*Mycteria americana*). This rookery is documented approximately 9 miles to the southeast of the property (Wood Storks, 2010) and the property is within the foraging area radii limits established for north Florida wood stork rookeries. The District will adhere to the guidelines established in the January 1990 (or any subsequent revision) U.S. Fish and Wildlife Service (FWS) *Habitat Management Guidelines for the Wood Stork in the Southeast Region*. District staff will utilize the most current data available from FWC or USFWS to determine the location of wood stork rookeries. Locations of rookeries will be mapped annually in advance of annual burn plans.

The conservation area is a significant Bald Eagle (*Haliaeetus leucocephalus*) nesting site. As of spring 2011, there were 15 documented Bald Eagle nesting sites within the conservation area, six of which included observed activity (Figure 9). Additionally, there are numerous nesting sites in close proximity to the property. The District will adhere to the guidelines established in the May 2007 U.S. Fish and Wildlife Service (FWS) *National Bald Eagle Management Guidelines*. This document is effective following the delisting of the species from the Endangered Species list. The bald eagle continues to receive protection through the Bald and Golden Eagle Protection Act and the <u>Migratory Bird Treaty Act</u>. The District will consult with the FWC and/or the FWS, prior to conducting management activities within the established management zones that may impact bald eagle nesting between the dates of October 1 to May 15. Additionally, the District will confirm activity status at known nesting sites each year. Should new nest sites be identified, GPS locations will be recorded and incorporated into the District Bald Eagle database.

The gopher tortoise (*Gopherus polyphemus*), a state Threatened species occurs within the conservation area. In 2001, in the eastern portions of it's range (Florida, Georgia, and South Carolina), the gopher tortoise was included on the U.S. Fish and Wildlife Service register as a candidate for listing. District staff are working to develop baseline population estimates within the sandhill, scrub, and scrubby restoration/enhancement areas on the LGCA. This data will be utilized in determining restoration needs and as a measure of success of the restoration and management efforts in these areas. This data will also be utilized as supplemental documentation for habitat improvement grant applications.

Figure 9 depicts the current (2011) locations and status of known Bald Eagle nest sites and the areas identified for tortoise burrow monitoring.

#### Floral and Faunal Strategies

#### **General Maintenance and Management Strategies**

• Collect species occurrence data and incorporate into the land management biological database.


- Adhere to the Wood Stork habitat management guidelines established by USFWS.
- Adhere to the USFWS National Bald Eagle Management Guidelines.

# **Specific Strategies**

#### Recurrent

- Annually survey Bald Eagle nesting sites and record activity status.
- Incorporate annually collected Bald Eagle nesting site data into the land management Bald Eagle database.
- Map Wood Stork and other bird rookeries in advance of annual burn plans.
- Conduct biennial gopher tortoise burrow surveys to document population dynamics within restoration/enhancement areas.

Short-term Planning Horizon (1-5 years)

• Coordinate with local Native Plant Society chapter(s) and other organizations to conduct diversity surveys targeting rare and listed species.

# **Fire Management**

Forest and fire management activities within the conservation area are critically important and integrally linked. The planning and implementation of forest and fire management activities must be coordinated to achieve restoration and management goals.

Fire is a vital factor in managing the character and composition of vegetation in many of the natural communities in Florida. The District's primary use of fire is to mimic natural fire regimes to encourage the amelioration of native pyric plant communities and dependant wildlife. Additionally, the application of fire aids in the reduction of fuels and minimizes the potential for catastrophic and damaging wildfires. Many of the natural communities at the LGCA are fire adapted, making prescribed fire an important tool for use in the restoration and maintenance of plant communities within the conservation area. Since the writing of the last plan, District staff have conducted 12 prescribed burns totaling 3,515 acres within the conservation area.

Historically, the majority of fires occurring on what is now the LGCA would have been ignited by lightning during the growing season. The District intends to reintroduce growing season fires where possible, understanding that constraints in some areas such as young pine plantations, high fuel loading, and proximity to smoke sensitive areas may predicate the use of dormant season burning. Figure 10 illustrates the fire management accomplishments since 2006 and includes wildfires.

Limiting factors narrowing the window of opportunity for the application of prescribed fire on portions of the conservation area is the close proximity to critical smoke sensitive areas including SR 17, numerous surface streets, developed residential areas, and the down drainage effects of Lake George and the St. Johns River. Most of the Lake George Conservation Area lies within an area of closed airspace (2907A). The airspace is closed to provide the US Navy with unfettered access to their bomb target within the lake itself. The District has entered into an agreement with the US Navy to allow the



District to use aircraft for prescribed burning, but the days available for aerial ignition are limited and require prior coordination with the Navy. This further complicates the District's ability to accomplish the prescribed burn goals for the LGCA.

Smoke management is paramount and any potential burns will be conducted to minimize off-site impacts by maneuvering smoke plumes away from smoke sensitive areas and by ensuring adequate smoke dispersal. A major challenge in implementing prescribed fire within the conservation area is the necessity of keeping fire from penetrating the floodplain swamp communities, where the organic soils, under dry conditions will smolder for extended periods of time creating a problematic smoke management situation. Appropriate soil and fuel moisture conditions will be selected to mitigate this potential. Smoke management concerns and smoke radii are depicted in Figure 11.

While prescribed fire is the preferred tool for restoration and maintenance within the conservation area, it may be necessary, under certain circumstances, to implement alternative methods. During periods of extended drought conditions or in areas where implementing prescribed fire safely is not feasible, the District may employ management methods such as selective herbicide treatments, mowing, roller chopping, and overstory manipulation.

During the summer of 2011, three large wildfires occurred within the conservation area and on neighboring property and burned for several weeks. Fire suppression actions resulted in the construction of numerous miles of plowed firelines across the conservation area. District staff will identify plow lines that will require rehabilitation and implement the appropriate remedial action. Since 2006, 1,592 acres have burned in 19 wildfires within the conservation area.

All implementation of prescribed fire within the conservation area will be conducted in accordance with the District's Fire Management Plan, the Lake George Conservation Area Fire Management Plan (Addendum 3), and the annual burn plans for the property.

# Fire Management Strategies

# **General Maintenance Activities**

• Implement prescribed burning as described in the District's Fire Management Plan and the Lake George Conservation Area Fire Management Plan.

# **Specific Strategies**

Recurrent

- Develop annual burn plans.
- Populate and maintain the fire management database.
- Conduct fireline maintenance.

Short-term planning horizon (1-5 years)

 $\circ~$  Identify and rehabilitate plowlines in areas where remedial action will not cause further damage.

Long-term planning horizon (5-10 years)



#### Forest Management and Restoration/Enhancement

Chapter 253.036, Florida Statutes requires the lead agency of state lands to prepare a forest resource analysis, "...which shall contain a component or section...which assesses the feasibility of managing timber resources on the parcel for resource conservation and revenue generation purposes through a stewardship ethic that embraces sustainable forest management practices if the lead management agency determines that the timber resource management is not in conflict with the primary management objectives of the parcel." The management objectives of this property requires pine and hardwood harvesting.

#### Forest Management

The LGCA is partitioned into forest management compartments and each compartment is further divided into stands. Figure 12 illustrates the compartments and stands within the conservation area and Figure 13 illustrates the dominant pine species within each stand. On properties like the LGCA, where silvicultural management is an intrinsic component of the overall management of the upland portions of the property, values, including timber inventory is collected. These values are verified and incorporated into the District's forest management database. Changes that may occur over time within the compartments and stands resulting from growth and harvest operations, and reforestation are also recorded in the database. This information is used to help land management staff forecast forest management needs.

While tailored to meet silvicultural management goals, the primary objectives of harvesting on the LGCA are restorative in nature and are to improve species diversity and the overall natural community health and vigor. The District applies all revenue generated through these forest management activities towards the District's land management budget to offset management costs for the property.

Since the writing of the last plan, forest management activities within the conservation area generated \$1,190,767. Table 4 provides information relative to forest management techniques (and associated acreage) employed within the conservation area since 2006 and Figure 14 illustrates the location of accomplished harvest activities and Figure 15 depicts the areas of accomplished longleaf pine plantings.





or., Source: X:LandMgmfiG ISUsersiP annersiJo Anna lake george/P he by species Map2.mxd, Time 9/23/2011 1:46:22 PM





Year	Forest Management Activity	Acres	Planting Species*
2006	Wildfire Salvage	5	
2008	Sand Pine Clearcut	126	
2008	1 <sup>st</sup> Thinning	828	
2008	Wildfire Salvage	26	
2008	Slash Pine Clearcut	79	
2008	Planting	26	Longleaf
2009	2 <sup>nd</sup> Thinning	797	
2009	Planting	22	Longleaf
2010	1 <sup>st</sup> Thinning	258	
2010	2 <sup>nd</sup> Thinning	147	
2010	Planting	261	Longleaf
2011	Wildfire Salvage	95	
2011	Planting	8	Longleaf

Table 4 – Forest Management Accomplishments

• All plantings were conducted at a rate of 605 stems per acre.

Forest management activities anticipated during the scope of this plan include forest inventory evaluations, reforestation, and pine thinning operations. Seedling survival monitoring is also conducted to assess the need for replanting an area through the determination of the number of target trees per acre. Reforestation projects may be preceded by various site preparation techniques including mechanical treatments such as harrowing and disking to remove silvicultural bedding, roller chopping and mowing, herbicide applications, and prescribed fire. These techniques may be used singularly or in combination as site conditions warrant. First thinning operations typically occur between the 18th and 22nd year and second thinning operations are conducted, on average, 15 years after the first. Third thinning operations generally fall 15-20 years following the second. These times are largely dependent on ecological factors that affect tree growth and basal area.

Figure 16 depicts the planned forest management activities through the year 2021 and Table 5 details that information. An itemized, stand level forest management table through 2021 is located in addendum 4.



Year	Harvest Type	Acres
2011	2 <sup>nd</sup> Thinning	59
2012	2 <sup>nd</sup> Thinning	181
2014	2 <sup>nd</sup> Thinning	116
2015	2 <sup>nd</sup> Thinning	33
2016	2 <sup>nd</sup> Thinning	96
2016	3 <sup>rd</sup> Thinning	64
2017	2 <sup>nd</sup> Thinning	372
2018	1 <sup>st</sup> Thinning	172
2018	2 <sup>nd</sup> Thinning	295
2019	2 <sup>nd</sup> Thinning	605
2020	1 <sup>st</sup> Thinning	200
2020	2 <sup>nd</sup> Thinning	300
2021	1 <sup>st</sup> Thinning	25
2021	2 <sup>nd</sup> Thinning	298
Year	Planting	Acres
Dependant on Budget Availability	Longleaf Pine Planting 605 stems/acre	150

Table 5 - Planned Forest Management Strategies

#### Restoration/Enhancement

Several areas have been identified for potential restoration or enhancement activities. Below is a general description of restoration actions to be implemented in the restoration units identified in Figure 17.



#### • Restoration Unit 1 (30 acres)

This unit is identified as a scrubby flatwoods and includes primarily Myakka and Cassia, fine sands. In 2008, the area was planted in longleaf pine, which subsequently exhibited poor survival (15% in 2008 and 22% in 2009). In 2010, the area was herbicided and then roller chopped to reduce the stature and coverage of shrubs and replanted in longleaf pine. The roller chopping site preparation had an unintended deleterious effect on the wiregrass within the unit. This area will be excluded from further roller chopping activities and since this area should have a distribution/mosaic of various xeric oaks, further herbicide applications to reduce oak coverage should not be conducted. District staff anticipates monitoring the survival of planted longleaf on this site through 2012. Scrubby flatwoods typically include a canopy of widely spaced pine trees. A successful pine planting in this area is likely to yield a lower rate of survival than mesic areas. Prescribed fire will be conducted as frequently as possible to encourage the growth of longleaf pine and the amelioration of wiregrass and other site appropriate species.

#### • *Restoration Unit 2 (88 acres)*

This unit is a matrix of scrubby flatwoods, mesic flatwoods, and likely includes some sandhill. Past management activities and the extent of pine plantations make delineating natural communities in this area difficult. The majority of this restoration unit was planted in slash pine in 1987 and the trees, while surviving, are not growing well. District staff anticipates clear cutting this area. Post clearcut, prescribed fire will be applied as frequently as fire will carry to encourage the reestablishment of appropriate groundcover species, which will help to determine the extent of the various natural communities in this area. Once the natural communities are refined, the need for pine plantings will be determined.

# • *Restoration Unit 3 (31 acres)*

This unit includes two disjunct areas that are primarily sandhill with some coverage of scrubby flatwoods. These areas were planted in longleaf pine in 2003. The areas were also subject to roller chopping and herbicide treatments as part of the site preparation for the above plantings. To protect residual wiregrass, roller chopping should not be conducted in these areas and herbicide treatments are not anticipated. If necessary, District staff will mow the area to aid in the facilitation of fire. Prescribed fire should be applied as frequently as fire will carry to aid in the amelioration of wiregrass. After several iterations of prescribed fire, District staff will evaluate wiregrass planting needs.

# • Restoration Unit 4 (15 acres)

This area is identified as a sand pine scrub. While the area exhibits a suite of site appropriate species, including Chapman's, myrtle, and sand live oak, the area is heavily overgrown. District staff anticipates the clearcut removal of sand pine from this area. Since there is likely not enough timber within this restoration unit, sale of this wood will need to be coupled with other sales. If the harvest of the sand pine does not reduce the stature of the scrub oaks enough to safely facilitate fire, District staff may employ mechanical treatments such as Brontosaurus mowing. Prescribed fire will be applied post harvest and any mechanical treatments. This area will be managed as a sand pine scrub. Additionally, this area will be evaluated for fireline needs.

#### • Restoration Unit 5 (94 acres)

This restoration unit includes three disjunct areas identified as scrub/scrubby flatwoods. The areas have been subject to numerous disturbances including clearcut harvests and several longleaf pine plantings between 2003 and 2006. All parcels include some distribution of sand pine, with a heavier coverage occurring in the northernmost site. District staff anticipate that some mechanical treatments will be necessary, primarily mowing. Roller chopping will be conducted only under adequate moisture regimes and with a spiral drum chopper only. Herbicide treatments to further control oaks are not recommended. Prescribed fire will be applied as frequently as possible. Since the southernmost area is scrub, pine plantings will not occur in this area. The two northern sites will be evaluated for plantings after several iterations of prescribed fire.

#### • Restoration Unit 6 (4 acres)

This restoration unit is identified as mesic flatwoods. The area was clearcut prior to District ownership and currently includes a coverage of salt bush, wax myrtle, and volunteer longleaf and slash pine. This are will be chopped, burned and planted in longleaf pine.

# • Restoration Unit 7 (2 acres)

This area is identified as wet flatwoods and was clearcut prior to public acquisition. The area currently includes a heavy coverage of saltbush and some pioneering hardwoods. This area will be chopped, burned and planted in slash pine.

# • Restoration Unit 8 (81 acres)

This area is identified as floodplain swamp. This restoration unit was cleared of cypress and other hydrophytic trees prior to public acquisition and is currently in an early successional state, dominated by sweet gum. District staff does not anticipate conducting any restoration on this site; however, it is identified for potential mitigation.

# Forest Management and Restoration Strategies

# **General Maintenance Activities**

#### 0

# Specific Strategies

#### Recurrent

- o Conduct visual monitoring for disease and/or insect infestation.
- Conduct seedling survival monitoring.

Short-term planning horizon (1-5 years)

- Conduct pine harvest operations as detailed (through 2015) in Table 5 and Addendum 4.
- Conduct harvests and mechanical treatments identified in restoration unit descriptions.
- Develop monitoring protocol for restoration units.

Long-term planning horizon (5-10 years)

• Conduct pine harvest operations as detailed (2016-2021) in Table 5 and Addendum 4.

- Conduct prescribed burns identified in restoration unit descriptions.
- Subject to budget availability or grant funding, conduct any necessary plantings identified in restoration unit descriptions

#### **Exotic Species**

Several exotic pest plants occur within the conservation area including:

- Camphor tree (*Cinnamomum camphora*)
- Chinese tallow (*Sapium sebiferum*)
- o Mimosa (Albizia julibrissin)
- Caesar weed (Urena lobata)
- Air potato (Discorea bulbifera)
- Japanese climbing fern (Lygodium japonicum)
- Bahia grass (Paspalum notatum)
- Bermuda grass (Cynodon sp.)
- Cogongrass (Imperata cylindrica)
- Paper mulberry (Broussonetia papyrifera)
- Britton's wild petunia (*Ruellia simplex*)
- Chinaberry (Melia azedarach)
- Tropical soda apple (*Solanum viarum*)

The LGCA is part of the District's invasive plant management program. Exotic species control is necessary to inhibit the continued proliferation of exotic plants and integral in the maintenance and restoration of natural plant communities. While it is unlikely that the District will entirely eradicate invasive plants within the conservation area, achieving maintenance control of such species is targeted within the scope of this plan. At this level, the property is regularly monitored and treated as necessary.

In an effort to better quantify the level of infestations within the conservation area and to better track the success of treatments, District staff will begin mapping infestations of exotic plant species with 2 acres of coverage or greater. Mapping efforts will focus on those species listed by the Florida Exotic Pest Plant Council (FLEPPC) as Category 1 species, which are those invasive exotics that are altering native plant communities by displacing native species. These species have the potential to change natural community structure and functions.

Exotic wildlife species known to occur within the conservation area include feral hogs (*Sus scrofa*), brown anoles (*Anolis sagrei*), and nine-banded armadillos (*Dasypus novemcinctus*).

Feral hog control is currently facilitated through a contract with The United States Department of Agriculture on an as needed basis and is subject to restrictions associated with the Lake George Wildlife Management Area. District staff intend to amend an existing pasture/hay agreement to include provisions for hog removal within the agreement area.

Laurel wilt, a disease of red bays (*Persea borbonia*) and other trees in the laurel family has been observed in red bay populations in areas near the conservation area. The disease

has not been specifically observed within the PBCA. Caused by a fungus, laurel wilt is carried and transmitted by the non-native red bay ambrosia beetle (*Xyleborus glabratus*.) The beetles generally attack healthy mature trees and the subsequent fungal infection causes the flow of water to be restricted to the leaves and branches, eventually causing mortality. Laurel wilt is devastating to infected populations and there are currently no established methods for controlling the laurel wilt disease in wild populations of *Persea*.

This disease has the potential to have detrimental effects on wildlife populations, including the palamedes swallowtail butterfly (*Papilio palamedes*). The palamedes is relatively common in Florida. Larval host plants for the palamedes swallowtail butterfly include species of *Persea*, but are primarily red bay.

Additional information on laurel wilt disease and the red bay ambrosia beetle can be found at http://www.fl-dof.com/publications/fh\_pdfs/Laurel\_Wilt.pdf and http://edis.ifas.ufl.edu/HS391.

Exotic Species Strategies

# **General Maintenance and Management Strategies**

- Document and report observations of exotic species.
- Coordinate with USDA hog removal agent.

# **Specific Strategies**

# Short-term Planning Horizon (1-5 years)

- Amend pasture/hay agreement to include provisions for hog removal within the agreement area.
- Locate and map infestations of FLEPPC Category 1 species with infestations of 2 acres or larger.
- Upload infestation data into land management database.

Long-term Planning Horizon (5-10 years)

• Inspect and map treated infestations of invasive exotics to measure success of treatments and assess additional needs.

# **Cultural Resources Protection**

A review of the Department of State, Division of Historical Resources (DHR) indicates no registered Florida Master Site File locations within the conservation area. If sites are located, District staff will document and report sites to the DHR. District land management activities that may affect or impact these resources will be evaluated and modified to reduce the potential for disturbance of the identified sites. Additionally, detrimental activities discovered on these sites will also be reported to the DHR and appropriate law enforcement agencies. Due to the District and State policy, the location of any sites will not be identified on public maps.

# Cultural Resource Protection Strategies

# **General Maintenance and Management Strategies**

• Identify and report any new sites.

# LAND USE MANAGEMENT

# Access

Two public parking areas are located on the conservation area. The parking areas are fenced and have walkthroughs providing for recreational access. An informational kiosk is located near the parking area trailheads.

Due to the number of open roads throughout the conservation area, there are currently 22 gates providing management access to and across the property. These gates are monitored regularly for maintenance and/or repair needs from normal wear and tear and vandalism. In an effort to expedite emergency responses and to assist law enforcement and fire rescue in locating individuals in the event of an emergency, 911 address have been issued for two of the parking areas. Table 6includes the 911 address for the conservation area.

911 Address	Location/Description
359 S. Georgetown Point Road	Parking Area
845 Lake George Road	Parking Area
715 Joe Pittman Road	Security Residence
1 Barrs Road	Public Access Point
735 Joe Pittman Road	Lake George Compound/Office

#### Table 6 – 911 Addresses

Several interior management roads traverse the conservation area, some of which are incorporated into a multiuse trail system. In order to manage road maintenance, District roads are classified according to anticipated maintenance needs. All roads within the conservation area are classified by the District as either Type A, B, C, D, or E. Table 7 details the extent of roads across the conservation area.

Type A roads are all weather roads and are typically constructed of concrete or asphalt. The roads are 18-24 feet wide with grassy shoulders and ditches that are maintained with mowing.

The Type A roads that fall within the conservation area include portions of Gerogetown-Denver Road and Lake George Drive, both County roads. The District has no management or maintenance responsibilities over these roads or associated shoulders and ditches.

Type B roads are all weather, stabilized roads that are frequently graded. These roads have shoulders and ditches (8-12 feet wide) that are frequently mowed. A portion of Harris-Fishcamp Road is a Type B road that falls within the conservation area, this road and associated shoulders and ditches is maintained by the County.

Type C roads are stabilized roads with a surface of native soils and grass. These roads have shoulders and ditches and are routinely mowed.

Type D roads are roads with limited stabilized surfaces with or without ditches (existing) that receive occasional traffic. Maintenance consists of routine mowing of the road surface and side and overhead vegetation.

Type E roads are seasonal roads between 9 and 12 feet wide that receive infrequent traffic. Maintenance is primarily limited to mowing to prevent vegetative encroachment. Many of the Type E roads serve as recreational trails. Some type E roads also double as firelines and as such are subject to harrowing or disking as needed to facilitate fire management needs.

Road Classification Type	Miles
Type A	2
Туре В	31
Type C	1
Type D	25
Туре Е	8
Total	67

Table 7 – Roads

Roads will be regularly inspected and receive maintenance and repair as necessary and may be subject to closure during these times. Any creation or expansion of clay/borrow pits is subject to the findings of a listed species survey of the borrow site and is subject to any subsequent permit requirements. Figure 17 depicts the location of the parking areas and roads on the property.

# Access Strategies

# **General Maintenance and Management Strategies**

• Maintain parking areas, signs, gates, roads, and trails.

# **Specific Strategies**

# Recurrent

- $\circ$  Update roads and firelines in the land management database.
- Maintain road signs within the conservation area

Short-term Planning Horizon (1-5 years)

- $\circ$   $\,$  Add all gates to the land management database.
- Confirm accuracy of data and geometry within the land management roads database.
- Determine the presence of additional clay in the vicinity of the borrow/clay pit for use in road stabilization projects within the LGCA subject to listed species survey and any potential permit requirements.

# Recreation

The primary objective of the Recreation Management Program is to facilitate resourcebased recreational activities on District lands. An aspect in developing the SJRWMD Recreation Program is not to compete with other local recreational opportunities, but rather to complement what they may already have in place by filling an outdoor



recreation niche through dispersed recreation opportunities. Dispersed recreation activities generally require large tracts of land with some level of isolation. This type of recreation blends well with District conservation areas, providing numerous opportunities for passive recreation, which also provides solitude and challenge.

Recreational opportunities within the LGCA are geared toward dispersed resource-based activities. The conservation area includes two trailheads with designated parking areas, information kiosks, and access to the land using trails that are primarily interior roads, and fire lines that are currently maintained for land and water management purposes. Additionally, the conservation area has five other access points where public roads either traverse the property or intersect with interior roads.

The LGCA supports numerous public recreational opportunities. The opportunities include hiking, biking, wildlife viewing, equestrian activities, fishing, primitive/group camping, and seasonal hunting. Approximately 8 miles of marked trails (and many more miles of interior roads and firelines) are available for recreation within the conservation area; portions of which incorporate the scenic vistas of Lake George. The Barrs Landing Loop Trail is an approximately 8 mile (round trip) marked loop trail that traverses a number of different natural communities. The trail begins at the Pine Island Trailhead just south of Lake George Road and ultimately leads to Lake George- as well as a group campsite- at Barrs Hammock. One group campsite is located near the trailhead itself at the southern end of the property. The other is located just north of Jumping Gully Branch, on the west side of Truck Trail 2. District will evaluate the extension of the Barrs Landing Loop trail to the Jumping Gully camp area, subject to need and budget/staffing availability. In addition to the group camp at Barr's Landing, there are two additional group camps at LGCA. Each group campsite is equipped with benches, fire rings, and a pitcher pump or artesian well (water is not for human consumption). The group camp at Pine Island Trailhead is equipped with a restroom facility.

Lake George is a popular lake for public boating, canoeing, and fishing. While there is not a boat launch located within the conservation area, recreational users may access the property via Lake George. Kayaks and canoes may be beached at Barrs Road and Middle Road landings, where access to the trail system is available. (The nearest boat ramp is located just south of Lake George Conservation Area near Willow Point. From US 17, follow County Road 305 west for approximately four miles. CR 305 then dead ends at Pine Island Fish Camp.). Public boat ramps are available elsewhere on Lake George.

Seasonal hunting opportunities are available at Lake George Conservation Area. Most of the LGCA has been incorporated into Lake George Wildlife Management Area, along with several other nearby publicly owned properties. Seasonal hunting opportunities administered by the Florida Fish and Wildlife Conservation Commission.

In an effort to improve recreational access for all users, in 2010, the District established and opened the self-guided driving trail. The trail is approximately 10 miles long and incorporates many different natural communities and points of interest within the conservation area. The trail incorporates existing roads and trails that are reliably passable in a two-wheel drive vehicle. Visitors may drive to posted points within the conservation area and the corresponding trail guide provides natural resource and management information relative to that location.

Off-road vehicle events are held annually within the LGCA. Prior to the event, the user group proposes a route. District staff review the route, suggest any necessary changes, and approve the proposed route. The route is designed to minimize disturbance to natural communities, and the effects of the event are monitored each year. District staff will continue to review, approve, and monitor the effects of the event.

During an off-road vehicle event in 2009, a wildfire occurred during the route establishment prior to the event. The fire was accidental, ignited by a fuel leak on a hot bike in dry grass. The fire burned approximately 340 acres, resulted in some timber loss, and required extensive mop up. The District has since developed criteria regarding acceptable site and weather conditions required to permit these events. For future events, the District will require additional insurance to cover such losses and expenses.

Historically, District trails and trailheads were maintained through a trail maintenance contract. Budget constraints have caused this responsibility to be shifted to District staff. District staff will target maintenance levels achieved through previous contracts, however, it is possible that other management responsibilities may result in less frequent maintenance. The targeted maintenance schedule includes:

- Mowing grassy trails and road edges four (4) times yearly.
- Mowing parking areas twice monthly, or as needed.
- Trail blazing and trimming of overhanging branches as needed.
- Trail and trailhead maintenance.

Subject to budget availability, the District may evaluate the need for further recreational development as visitor usage increases or new land is acquired.

Figures 18 and 19 are the recreation trail guides for the conservation area.

The entire conservation area is open to the public for passive recreation and is included in the District's <u>*Recreation Guide to District Lands*</u>, which can be viewed online at floridaswater.com.

Figure 18 – Recreation Map





# **Recreation Strategies**

# **General Maintenance and Management Strategies**

- Maintain parking areas, kiosks, and trails.
- Coordinate with FWC to maintain Wildlife Management Area.
- Maintain current information in recreation guide, trail guides, kiosks, and District website.

#### **Specific Strategies**

Recurrent

- Mow recreational trails four times each year.
- Mow/maintain parking areas twice monthly.
- Mow/maintain primitive campsites monthly.
- Maintain restroom-servicing contract.
- Conduct trail blazing and trimming maintenance.
- Facilitate and monitor off-road vehicle event.

Short-term Planning Horizon (1-5 years)

• Revise text in self-guided auto trail guide to reflect changes in property as a result of management activities.

Long-term Planning Horizon (5-10 years)

- Evaluate and prioritize potential/need for additional recreational facilities.
- Extend the Barrs Landing loop trail to the Jumping Gully campsite.

#### **Environmental Education**

The District has historically looked for opportunities to partner with local schools and organizations to encourage the use of District lands for environmental education. While the District is still open to such opportunities, during Fiscal Year 2011 the District funding and positions allocated for environmental education were eliminated due to budget reductions.

#### Environmental Education Strategies

# **General Maintenance Strategies**

• Continue to offer environmental education opportunities subject to staff and budget availabilities.

#### Security

Security concerns within the conservation area include illegal motorized vehicle access, dumping, vandalism of gates, fences, facilities, and poaching. The District, primarily through a contract security firm as well as coordination with FWC and local law enforcement, administers law enforcement for the property. A security residence is located on the southern end of the conservation area.

Due to the openness of the property to the public, many boundaries within the conservation area have not been fenced, including many upland boundaries. District staff have identified several areas within the conservation area that will require fencing to mitigate undesirable activities such as illegal vehicular access and dumping. Many of these areas will require the removal of vegetation to facilitate the construction of a fence line. During the scope of this plan, District staff will identify, map, and prioritize all areas requiring fencing. Pending budget availability for such projects, fencing will be constructed in highest priority areas first. The borrow/clay pit on the northeastern portion

of the property is a problematic area with regards to illegal vehicle access, off road vehicle activities, and dumping. During the scope of this plan, District staff will develop a plan to restrict access to the pit from the numerous roads that lead to this area. Construction of new fence and replacement of existing fence will be subject to budget availability.

#### Security Strategies

#### **General Maintenance and Management Strategies**

- Coordinate with local law enforcement and FWC for security needs.
- Maintain contract with private security firm
- Maintain security residence agreement.
- Conduct biennial boundary posting maintenance.

#### **Specific Strategies**

#### Recurrent

• Develop monthly, prioritized security needs and provide to contracted security firm.

Short-term Planning Horizon (1-5 years)

- Post boundary south of Lake George Drive.
- Secure area around the borrow/clay pit.
- Identify, map, and prioritize locations of fencing needs.

# **ADMINISTRATION**

#### Land Acquisition

There are no anticipated acquisitions associated with the Lake George Conservation area in the next ten years. The District may pursue acquisition of small parcels or easements that may improve access for management purposes.

#### Land Acquisition Strategies

#### **General Maintenance and Management Strategies**

• Evaluate adjacent properties and in holdings for potential acquisition.

#### **Cooperative Agreements, Leases, Easements, and Special Use Authorization**

In accordance with District Policy #90-16, the District promotes entering into agreements with other agencies and private parties for cooperation and coordination of management of the District's lands. These cooperative agreements serve to protect the District's water management interests and to enhance the management and public value of the land. Table 8 details the agreements and SUAs in effect during the writing of this plan.

Agreement Number	Туре	Agreement Name	Term
190	Intergovernmental	US Navy – restricted airspace	Expires 3/1/2098
552	SUA	Hurricane Island Outward Bound – Solo Camp	Annual renewal; expires March 9, 2014
56	Intergovernmental	Volusia County; management designation of Lake George Forest	Expires March 13, 2043
366	Lease	Mills, grazing/horse exchange	Terminates at the initiation of either party.
108, 376, 57	Intergovernmental Lease(s) and amendments	Lake George Wildlife Management Area	June 20, 2045
745	Employee Residence Agreement	Mills, Warren D.	Terminates as requested by either party.
706	SUA	Misty Morning Hounds	Annual renewal; expires on September 30, 2015
88	SUA	Puckett, Grayson R – palm frond harvesting	Annual renewal; expires on May 31, 2015
761	SUA	Tyrrell, Michael and Kristy – Apiary	Annual renewal; expires on April 24, 2016

Table 8 – Agreements, Easements, and SUA Table

<u>Cooperative Agreements, Leases, Easements, and Special Use Authorizations Strategies</u> General Maintenance and Management Strategies

• Administer easements, agreements, leases, and SUAs.

# **Specific Strategies**

Recurrent

• Annually amend roster for Pucket/palm harvesting.

- Short-term Planning Horizon (1-5 years)
  - Amend the existing pasture/hay agreement to include provisions for hog removal within the agreement area.

# **IMPLEMENTATION CHART**

Lake George Conservation Area Implementation Chart

TASK	RECURRENT	1-5 YEARS	5-10 YEARS	LEAD (COOPERATOR)
<b>RESOURCE PROTECTION</b>	AND MANAGE	MENT	<b>I L</b> IND	(COOT EREITOR)
Water Resources				
General Maintenance				
Conduct maintenance and				
incidental or emergency repair				DOM
of water resource structures as				DON
necessary.				
Maintain water resource				
structures database and				DON
incorporate maintenance,				DON
repair, and any new structures.				
Recurrent				
Visually inspect roads, trails,				
low water crossings, bridges,				
and culverts for erosion	Annually			DON
problems and maintenance and				
repair needs.				
Short-term Planning Horizon				
Identify and map firelines				
located in ecotonal areas that				
can be rehabilitated and		2013		DON
incorporated into fire				
management activities.				
Identify restoration needs in		• • • •		5.011
shrub encroached herbaceous		2012		DON
wetlands.				
Implement restoration in shrub		2014		DON
encroached herbaceous		2014		DON
wetlands.				
Locate and GPS the extent of				
within the improved postures		2012		DON
Unload GPS data locations to		2012		(DRS)
permanent CIS database				
Determine restoration needs				
and feasibility of the ditches				DON
and swales within the		2013		(DRS)
improved pastures				

Conduct hydrologic restoration of ditches and swales within the improved pastures.		2014		DON (DRS)
Long-term Planning Horizon				
Replace wooden bridge on			2017	DON
Cumbie road.			2017	DON
Identify and map locations of				
shallow ditches/swales that are				
connecting and draining				
isolated and/or ephemeral				DON
wetlands within the flatwoods			2017	(DRS)
and incorporate into regional				(DRS)
database for restoration needs				
or mitigation potential and				
opportunities.				
Floral and Faunal				
General Maintenance				
Collect species occurrence data				
and incorporate into the land				DON
management biological				DOIN
database.				
Adhere to the Wood Stork				
habitat management guidelines				DON
established by USFWS.				
Adhere to the USFWS				
National Bald Eagle				DON
Management Guidelines.				
Recurrent				
Survey Bald Eagle nesting sites	Annually by			DON
and record activity.	March 31 <sup>st</sup>			(DRS)
Incorporate annually collected	Annually by			5.011
Bald Eagle nesting site data	September			DON
into the land management Bald	30th			(DRS)
Eagle database.	A 11 1			
Map Wood stork and other bird	Annually by			DON
rookeries in advance of annual	September			(DRS)
burn plans.	30th			
tonduct biennial gopher	October			
tortoise burrow surveys to	2011, 2013,			DON
document population dynamics	2015, 2017,			(DRS)
within restoration/enhancement	2019, 2021			
alcas. Short tarm Dianning Houizon				
Short-term 1 tunning 11011201				

Coordinate with local Native			
Plant Society chapter(s) and		2012	DON
other organizations to conduct		2013	 DON
diversity surveys targeting rare			(DRS)
and listed species.			
Fire Management			
General Maintenance			
Implement prescribed burning			
as described in the District's			
Fire Management Plan and the			 DON
Lake George Conservation			
Area Fire Management Plan.			
Recurrent			
Develop annual burn plans.	Annually by		
	September		 DON
	$30^{\text{th}}$ .		
Populate and maintain fire	Annually by		DON
management database.	September		 (DPS)
	$30^{\text{th}}$ .		(DKS)
Mow and maintain Helispot.	Minimum		
	twice		 DON
	annually.		
Conduct fireline maintenance.	Biannually		
	Spring and		
	Fall unless		DON
	site conditions		 DON
	warrant		
	otherwise		
Short-term Planning Horizon			
Identify and rehabilitate plow			
lines in areas where remedial		0010	DOM
action will not cause further		2013	DON
damage.			
Forest Management			
General Maintenance			
Conduct visual monitoring of			
forested areas to identify signs			
of disease and/or insect			 DON
infestation			
Recurrent			
Conduct seedling survival			
monitoring in planted areas	Annually		 DON
Short term Planning Horizon			
Conduct pipe harvest operations			
as detailed (through 2015) in		2011-	 DON
Table 5 and Addendum 4		2015	 DON

Conduct harvests and mechanical treatments identified in restoration unit descriptions.	 2014		DON
Develop monitoring protocol for restoration units.	 2012		DON
Long-term Planning Horizon			
Conduct pine harvest			
operations as detailed (2016- 2021) in Table 5 and Addendum 4.	 	2016- 2021	DON
Conduct prescribed burns		2016	
identified in restoration units	 	2016-2021	DON
Subject to budget availability			
or grant funding, conduct any necessary plantings identified in restoration unit descriptions.	 	2019- 2021	DON
Exotic Species			
General Maintenance			
Document and report			DON
observations of exotic species.	 		(DOS)
Coordinate with USDA hog			DON
removal agents.	 		DON
Recurrent			
Short-term Planning Horizon			
Amend existing pasture/hay			
agreement to include	 2012		DON
provisions for hog removal	 2012		(DRS)
within the agreement area.			
Locate and map infestations of			
FLEPPC Category I species	 2014		DON
with infestations of 2 acres or			(DOS)
larger.			DON
Upload infestation data into	2015		DON (DOS)
land management database.	 2013		(DOS)
Long-term Planning Horizon			(DRS)
Inspect and map treated			
infestations of invasive exotics			DON
to measure success of	 	2018	(DOS)
treatments and assess			(DRS)
additional needs.			
<b>Cultural Resource Protection</b>			
General Maintenance			

Identify and report any new			 DON
sites.			(DHR)
Access			
General Maintenance			
Maintain parking areas, signs,			DON
gates, roads, and trails.			 DON
Recurrent			
Update roads and firelines in	Annually by		DON
the land management database	September		 DON (DDS)
	30th		(DKS)
Maintain road signs within the	Annually by		DON
conservation area.	December 31 <sup>st</sup>		 DON
Short-term Planning Horizon			
Add all gates to the land		2012	DON
management database.		2013	 (DRS)
Confirm accuracy of data and			DON
geometry within the land		2013	 DUN (DDS)
management roads database.			(DKS)
Determine the presence of			
additional clay in the vicinity			
of the borrow/clay pit for use			DON
in road stabilization projects		2012	 DON (DDS)
within the LGCA, subject to			(DKS)
listed species survey and any			
potential permit requirements.			
Long-term Planning Horizon			
Recreation			
General Maintenance			
Maintain parking areas, kiosks,			DON
and trails.			 DON
Coordinate with FWC to			DON
maintain Wildlife Management			 (FWC)
Area.			(DRS)
Maintain current information			DON
in recreation guide, trail			DUN (DDS)
guides, kiosks, and District			 (DKS)
website.			$(0\mathbf{C})$
Recurrent			
Mow recreational trails.	Quarterly		DON
Mow/maintain parking areas.	Bimonthly		 DON
Mow/maintain primitive/group	Manthler		DOM
campsites.	Monthly		 DON
Maintain restroom service	Annually by		DON
contract.	Sept. 30th		

Conduct trail blazing and trimming maintenance.	Annually by December 31 <sup>st</sup> .			DON
Facilitate and monitor off-road vehicle event.	Annually			DON (DRS)
Short-term Planning Horizon				
Revise text in self-guided auto trail to reflect changes in property as a result of management activities.		2012		DON (DRS) (OC)
Long-term Planning Horizon				
Evaluate and prioritize the potential/need for additional recreational facilities.			2017	DON
Extend Barrs landing loop trail to the Jumping Gully campsite.			2017	DON
Environmental Education				
General Maintenance				
Continue to offer educational opportunities if possible and subject to staff and budget availability.				DC (DON)
Security				
General Maintenance				
Coordinate with local law enforcement and FWC for security needs.				DON (FWC) (VC) (PC)
Maintain contract with private security firm.				DON
Maintain security residence agreement.				DON (DRS)
Recurrent				
Develop monthly, prioritized security needs and provide to contracted security firm.	Monthly			DON
Conduct biennial boundary posting maintenance.	2013, 2015, 2017, 2019, 2021			DON
Short-term Planning Horizon				
Post boundary south of Lake George Drive.		2012		DON
Secure area around the borrow/clay pit.		2012		DON
Identify, map, and prioritize locations of fencing.		2012		DON

Land Acquisition			
General Maintenance			
Evaluate adjacent properties and in-holdings for potential acquisition.			 DRS (DON)
Cooperative Agreements,			
Leases, Easements, and			
Special Use Authorizations			
General Maintenance			
Administer easements,			DON
agreements, leases, and SUAs			 (DRS)
Recurrent			
Annually amend roster for	Annually by		DRS
Pucket/palm frond agreement.	January 1 <sup>st</sup>		 (DON)
Short-term Planning Horizon			
Amend existing pasture/hay			
agreement to include		2012	DRS
provisions for hog removal		2012	 (DON)
within the agreement area.			

# **IMPLEMENTATION CHART KEY**

DON	Division of Operations North
DOS	Division of Operations South
DRS	Division of Real Estate Services
FFS	Florida Forest Service
FDHR	Florida Division of Historical Resources
FWC	Florida Fish and Wildlife Conservation Commission
OC	Office of Communication
PC	Putnam County
VC	Volusia County

# Addendum 1 Listing Status/Ranking Definitions

#### FNAI GLOBAL RANKING

G1 = Critically imperiled globally because of extreme rarity (5 or fewer occurrences or less than 1000 individuals) or because of extreme vulnerability to extinction due to some natural or man-made factor. G2 = Imperiled globally because of rarity (6 to 20 occurrences or less than 3000 individuals) or because of vulnerability to extinction due to some natural or man-made factor.

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

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

G5 = Demonstrably secure globally.

#### FNAI STATE RANKING

S1 = Critically imperiled in Florida because of extreme rarity (5 or fewer occurrences or less than 1000 individuals) or because of extreme vulnerability to extinction due to some natural or manmade factor.

S2 = Imperiled in Florida because of rarity (6 to 20 occurrences or less than 3000 individuals) or because of vulnerability to extinction due to some natural or man-made factor.

S3 = Either very rare and local in Florida (21-100 occurrences or less than 10,000 individuals) or found locally in a restricted range or vulnerable to extinction from other factors.

S4 = Apparently secure in Florida (may be rare in parts of range).

S5 = Demonstrably secure in Florida.

#### STATE LEGAL STATUS

**LE** Endangered: species, subspecies, or isolated population so few or depleted in number or so restricted in range that it is in imminent danger of extinction.

**LT** Threatened: species, subspecies, or isolated population facing a very high risk of extinction in the future.

**LS** Species of Special Concern is a species, subspecies, or isolated population which is facing a moderate risk of extinction in the future.

**PE** Proposed for listing as Endangered.

**PT** Proposed for listing as Threatened.

**PS** Proposed for listing as Species of Special Concern.

N Not currently listed, nor currently being considered for listing.

#### FEDERAL LEGAL STATUS

**LE** Endangered: species in danger of extinction throughout all or a significant portion of its range.

**LT** Threatened: species likely to become Endangered within the foreseeable future throughout all or a significant portion of its range.

LT,PDL Species currently listed threatened but has been proposed for delisting.

LT,PE Species currently listed Threatened but has been proposed for listing as Endangered.

**PE** Proposed for listing as Endangered species.

**PT** Proposed for listing as Threatened species.

**C** Candidate species for which federal listing agencies have sufficient information on biological vulnerability and threats to support proposing to list the species as Endangered or Threatened.

**XN** Non-essential experimental population.

**SC** Not currently listed, but considered a "species of concern" to USFWS.

**N** Not currently listed, nor currently being considered for listing as Endangered or Threatened.
## **Addendum 2 Soils**

The Adamsville series consists of very deep, somewhat poorly drained, rapidly permeable soils on broad flats, low knolls, and lower side slopes. They formed in thick sandy marine sediments in central and southern Florida. Natural vegetation consists of pines, laurel, and water oaks with a ground cover of saw palmetto, pineland threeawn, indiangrass, bluestem grasses, and several low panicums.

The Apopka series consists of very deep, well drained, moderately permeable soils on ridges and side slopes in the Lower Coastal Plain. They formed in thick beds of sandy and loamy marine or eolian deposits. The understory vegetation supported by this series may consist of bluestem, dog fennel, paspalum, pineland threeawn, and other native grasses and weeds.

The Astatula series consists of very deep, excessively drained, rapidly permeable soils that formed in eolian and marine sands. Natural vegetation may consist of blue jack, blackjack, turkey oaks, longleaf pine, sand pine, and an understory of rosemary, pineland threeawn, bluestem, paspalum, lopsided indiangrass, and panicum.

The Astor series consists of very poorly drained, rapidly permeable soils that formed in sandy marine sediments. They occur in low, nearly level areas, poorly defined drainageways, and flood plains in Peninsular Florida. Natural vegetation in swamps consists of sweetgum, red maple, water oak, laurel oak, and a few slash pine or loblolly pine with an understory of waxmyrtle, inkberry, cabbage palm, greenbrier, and poisonivy; in sloughs or marshes, and sand cordgrass and grasswort predominate.

The Bluff series consists of very deep, very poorly drained, slowly permeable soils in marshes and on broad low terraces along rivers. They formed in thick beds of alkaline loamy marine sediments. The native vegetation consists of swamp white oak, tupelo gum, swamp maple, cypress, and palm, with scattered loblolly pine some areas. The understory vegetation consists of several bluestem species, hairy panicum, longleaf uniola, vines, and forbs.

The Cassia series consists of very deep, somewhat poorly drained, moderately rapid permeable soils on low ridges and knolls that are slightly higher than the adjacent flatwoods. The native vegetation supported by this series generally consists of scattered slash pine, longleaf pine, and saw palmetto.

The Centenary series consists of very deep, well drained or somewhat excessively drained, moderately permeable soils in marine sediments. These soils are commonly associated with longleaf and loblolly pine, blackjack, turkey and post oaks.

The Daytona series consists of very deep, moderately well drained, moderately rapid permeable soils on knolls and ridges in the flatwoods. They formed in sandy deposits of marine or eolian sediments. The native vegetation may include sand pine with an understory of creeping bluestem, broom sedge bluestem, splitbeard bluestem, lopsided indiangrass, pineland threeawn, switchgrass, panicum, and paspalums.

The Deland series consists of very deep, well drained, moderately permeable soils on low, broad, sand hills. They formed in thick beds of marine, eolian, or fluvial sediments on the lower Coastal Plain. The natural vegetation may include sand live oak, turkey oak, along with scattered saw palmetto, and clumps of pineland threeawn, prickly pear, and broom sedge bluestem.

The Electra series consists of somewhat poorly drained soils that formed in thick beds of sandy and loamy marine sediments on slight ridges in the flatwoods areas of central and southern Florida. Native vegetation may include dwarf live oak, a few longleaf and sand pine, running oak, saw palmetto, and blueberry. Understory vegetation may include creeping bluestem, chalky bluestem, lopsided indiangrass, low panicum, pineland threeawn, paspalum, and numerous forbs.

The Hobe series consists of very deep, somewhat excessively drained, moderately permeable soils on elevated knolls and ridges in the flatwoods areas of the lower Coastal Plains of Florida. They formed in thick beds of sandy and loamy marine sediments. The vegetations primarily consists of sandpine, scattered slash pine, sand live oak, running oak, sand heath, sawpalmetto, fetterbush, and a few widely spaced pineland threeawn and panicum grasses.

The Holopaw series consists of deep and very deep, poorly and very poorly drained soils formed in sandy marine sediments. Slopes range from 0-2% and are found on low lying flats, in poorly defined drainages or depressional areas. Native vegetation is scattered slash and pond pine, cabbage and saw palmettos, scattered cypress, myrtle, sand cordgrass, and pineland three awn.

The Hontoon series consists of deep, very poorly drained, rapidly permeable organic soils formed in hydrophytic non-woody plant remains. These soils occur in fresh water swamps and marshes. Native vegetation is loblolly, bay, maple, gum, and scattered cypress trees with a ground cover of greenbriers, ferns, and other aquatic plants. In a few areas there are slash pines with a ground cover of fern.

The Immokalee series consists of deep to very deep and poorly drained to very poorly drained soils that formed in sandy marine sediments. They occur on flatwoods and in depressions of Peninsular Florida. Slopes tend to be 0 - 2%, but may range to 5%. Principle vegetation is longleaf and slash pine with undergrowth of saw palmetto, gallberry, wax myrtle, and pineland threeawn. In depressions, water tolerant plants such as cypress, loblolly bay, gorodonia, red maple, sweetbay, maidencane, bluestem, sand cordgrass, and blue joint panicum are more common. Most areas with Immokalee soils are in rangeland and forests.

The Lochloosa series consists of somewhat poorly drained, slowly permeable soils formed in thick beds of sandy and loamy marine sediments in central Florida. Native

vegetation consists of slash and loblolly pine, dogwood, hickory, live, laurel and water oak, sweetgum, red maple, and magnolia. The understory is waxmyrtle, briars, and native grasses.

The Millhopper series consists of very deep, moderately well drained, moderately permeable soils that formed in thick beds of sandy and loamy marine sediments. Native vegetation consists of live oak, laurel oak, post oak, water oak, sweetgum, cherry laurel, few hickory, and slash and longleaf pine. The understory is chiefly lopsided indiangrass, hairy panicum, low panicum, greenbrier, hawthorne, persimmon, fringeleaf paspalum, chalky and creeping bluestems, and pineland threeawn.

The Myakka series consists of deep and very deep, poorly to very poorly drained soils formed in sandy marine deposits. These soils are on flatwoods, high tidal areas, flood plains, depressions, and gently sloping to barrier islands. Slopes in areas where these soils are found range from 0-8%. Native vegetation includes longleaf and slash pines with an undergrowth of saw palmetto, running oak, inkberry, wax myrtle, huckleberry, chalky bluestem, pineland threeawn, and scattered fetterbush.

The Narcoossee series consists of very deep, somewhat poorly drained soils that formed in thick sandy sediments of marine origin. These soils are on low knolls and ridges in the flatwoods areas of central and southern Peninsular Florida. Native vegetation is dominantly water oak, willow oak, live oak, laurel oak, longleaf pine, slash pine, greenbrier, sawpalmetto, pineland threeawn, creeping bluestem, panicum, purple lovegrass, and lopsided Indiangrass.

The Ona series consists of poorly drained, moderately permeable soils that formed in thick sandy marine sediments. They are in the flatwood areas of central and southern Florida. Natural vegetation is slash pine and longleaf pine, gallberry, widely spaced sawpalmettos, huckleberry, and pineland threeawn.

The Orsino series consists of very deep, moderately well drained, very rapidly permeable soils that formed in thick beds of sandy marine or aeolian deposits. They are on moderately high ridges in the coastal plain. Native vegetation consists primarily of scrub vegetation with sand live oak, Chapman oak, myrtle oak, and scrub hickory. Scattered sand, slash, and longleaf pines and scattered blue jack, turkey, and post oak are found with a sparse understory.

The Paola series consists of very deep, excessively drained, very rapidly permeable soils on uplands. They formed in thick sandy marine deposits. These soils are on uplands of the Coastal Plain. Native vegetation consists of sand pine, slash pine, longleaf pine, scrub live oak, scattered turkey oak, and bluejack oak. The undergrowth consists of cacti, mosses, lichens, creeping dodder, rosemary, and scattered sawpalmetto.

The Placid series consists of very deep, very poorly drained, rapidly permeable soils on low flats, depressions, poorly defined drainageways on uplands, and flood plains on the Lower Coastal Plain. They formed in sandy marine sediments. Natural vegetation consists of pond pine, bay, cypress, gum, pickerel weed, and coarse grasses.

The Pomona series consists of very deep, poorly and very poorly drained, moderate to moderately slowly permeable soils on broad low ridges on the Lower Coastal Plain. They formed in sandy and loamy marine sediments. The native vegetation consists of slash pine (Pinus Elliottii), longleaf pine (Pinus Palustris), and south Florida slash pine (Pinus Elliottii Densa) with an understory of sawpalmetto, waxmyrtle, gallberry, creeping bluestem, chalky bluestem, indiangrass, and pineland threeawn.

Pompano consists of very deep, very poorly drained, rapidly permeable soils in depressions, drainageways, and broad flats. They formed in thick beds of marine sands. Mean annual precipitation is about 50 inches and slopes range from 0-2%. Natural vegetation consists of palmetto, widely spaced cypress, gum, slash pine, and native grasses.

The Riveriera series consists of very deep, poorly drained, very slowly permeable soils on broad, low flats and in depressions in the lower coastal plain. They formed in stratified sandy and loamy marine sediments on the lower coastal plain. Slopes in areas where these soils are found range from 0-2%. Native vegetation consists of slash pine, cabbage, and saw palmetto, scattered cypress, maidencane, and pineland threeawn.

The Samsula series consists of very deep, very poorly drained, rapidly permeable soils that formed in moderately thick beds of hydrophytic plant remains and are underlain by sandy marine sediments. These soils are in swamps, poorly defined drainage ways, and flood plains. Slopes are less than 2%. Natural vegetation is loblolly bay, with scattered cypress, maple, gum, and trees with a ground cover of greenbriers, ferns, and other aquatic plants.

The St. Johns series consists of very deep, very poorly or poorly drained, moderately permeable soils on broad flats and depressional areas of the lower Coastal Plain. They formed in sandy marine sediments. Principal vegetation of the forested areas is longleaf pine, slash pine, and pond pine with an undergrowth of saw palmetto, gallberry, wax myrtle, huckleberry, and pineland threeawn.

The Smyrna series consists of very deep, poorly to very poorly drained soils formed in thick deposits of sandy marine materials. Natural vegetation consists of longleaf and slash pines with an undergrowth of saw palmetto, running oak, gallberry, wax myrtle, and pineland three awn.

The Sparr series consists of very deep, somewhat poorly drained, moderately slowly to slowly permeable soils on uplands of the coastal plain. They formed in thick beds of sandy and loamy marine sediments. Native vegetation consists of longleaf pine, slash pine, loblolly pine, magnolia, dogwood, hickory, and live oak, laurel oak, and water oak.

The Tavares series consists of very deep, moderately well drained, rapidly or very rapidly permeable soils on lower slopes of hills and knolls of the lower Coastal Plain. They formed in sandy marine or eolian deposits. In most places the natural vegetation consists of slash pine, longleaf pine, a few scattered blackjack oak, turkey oak, and post oak with an undercover of pineland threeawn. In some places natural vegetation consists of turkey oak, blackjack oak, and post oak with scattered slash pine and longleaf pine.

The Terra Ceia series consists of very deep, very poorly drained organic soils that formed from nonwoody fibrous hydrophytic plant remains. They occur mostly in nearly level freshwater marshes and occasionally on river floodplains and in tidal swamps or flats. Natural vegetation includes sawgrass, lilies, sedges, reeds, maidencane, and other aquatic plants. Wooded areas include cypress, black gum, cabbage palm, Carolina ash, loblolly bay, red maple, sweet bay, and pond pine. Large undeveloped areas are used for wildlife habitat and water storage.

The Tomoka series consists of deep, very poorly drained, moderately permeable soils that formed in decomposed dark reddish brown and black organic material about 27 inches thick over sand and loamy mineral material. Native vegetation is saw grass, lilies, reeds, sedges, myrtle and other aquatic plants. Cypress, red and white bay, maple and pond pine are common tree species.

The Zolfo series consists of very deep, somewhat poorly drained soils that formed in thick beds of sandy marine deposits. These soils are on low broad landscapes that are slightly higher than adjacent flatwoods on the lower Coastal Plain of Central Florida. Native vegetation consists of scattered turkey, laurel, or water oaks; long leaf or slash pine with an undercover of pineland threeawn, bluestem, lopsided Indian grass, gallberry, native weeds and saw palmetto. Addendum 3 Fire Management Plan

# LAKE GEORGE Conservation Area

# FIRE MANAGEMENT PLAN

PREPARED BY

# ST. JOHNS RIVER WATER MANAGEMENT DISTRICT

# LAKE GEORGE CONSERVATION

# FIRE MANAGEMENT PLAN Putnam and Volusia Counties, Florida

The District Fire Management Plan provides general fire management information relative to policy, procedure, and reporting. This document provides the guidelines for the implementation of prescribed fire activities on the Lake George Conservation Area (LGCA).

# Introduction and Objectives

The property is located within several Sections of Township 8 South, Ranges 29 and 30 East. Figure 1 is a 2009 aerial image of the property and Figure 2 depicts the location of the conservation area.

The LGCA covers approximately 11,794 acres in Putnam and Volusia Counties along the shoreline of Lake George. This conservation area is located in numerous Sections of Township 8 South, Ranges 29 and 30 East.

The conservation area is located immediately west of US Highway 17 and is bound to the west by Lake George. County roads 308 and 305 border the property near its northern and southern boundaries, respectively. Truck Trail 2 is a District-maintained north-south thoroughfare that bisects the property. Harris-Fish Camp Road is a County maintained road that crosses the property. Numerous secondary roads cross the conservation area. These named roads include:

- o Barrs Road
- o Denver Road
- Jumping Gully Road
- Middle Road
- Truck Trail 1
- o Aces Road
- Silver Pond Road
- o Tory Road

Figure 1 depicts the general location of the conservation area.

Historically, fires have played a vital role in the shaping and maintenance of many of the natural communities in Florida. As such, most vegetative communities and associated wildlife are fire adapted and in many instances fire dependant. Conversely, the exclusion of fire from an area allows for successional changes within the natural community. Fire exclusion leads to the excessive accumulation of fuel loads, which increase the risk for catastrophic wildfires. The goals for the implementation of fire management activities within the LGCA include:



- Reduction of fuel loads through the application of dormant season burns to decrease potential risk of damaging wildfires
- Reintroduction of growing season burns to encourage the amelioration of native fire adapted ground cover species
- Mitigation of smoke management issues
- Restoration and maintenance of a mosaic of natural plant communities and ecological diversity
- Maintenance and restoration of ecotonal areas

The achievement of these goals requires that the conservation area be partitioned into manageable burn units prior to the application of prescribed fire within those units. The following sections summarize the considerations necessary for the safe and effective use of prescribed fire as a land management tool within the LGCA.

# Fire Return Interval

The general frequency to which fire returns to a community type is termed its' fire return interval. Some communities require frequent pyric disturbances to perpetuate themselves while others are not fire adapted and subsequently do not require fire to maintain their characteristics. The following table (Table 1.) and discussion of native plant communities occurring on the Conservation Area and optimal fire return intervals was characterized in part using information from the Florida Natural Areas Inventory's *Guide to the Natural Communities of Florida*.

Community Type	Fire return Interval
Floodplain Swamp	This community is not fire adapted.
Basin Swamp (edges)	Infrequent. Edges may burn in conjunction with
	ecotones and adjacent communities.
Depression Marsh	This community burns with adjacent communities.
Bottomland Forest	This community is not fire adapted.
Dome Swamp (edges)	3-5 years along the outer edges (or as adjacent
	communities burn); 100-150 years interior
Flatwoods Lake	Infrequent. Edges may burn in conjunction with
	ecotones and adjacent communities.
Sandhill Upland Lake	Grassy edges will burn in conjunction with adjacent
	communities
Scrub	8-15 years for oak dominated; up to 40 years in sand
	pine systems.
Sandhill	1-3 years
Xeric Hammock	Site specific, but generally infrequent and
	catastrophic.
Mesic Flatwoods	2-4 years
Scrubby Flatwoods	5-15 years
Wet Flatwoods	1-3 years in grass dominated systems; 5-7 years in
	shrubbier systems
Wet Prairie	2-3 years

Table 1.

The above referenced fire return intervals relate to high quality natural communities. The fire return interval within degraded systems is variable, often elongated. Prescribed fire will be applied as necessary to achieve restoration and management goals.

Wet, mesic, and scrubby flatwoods as well as sandhill and scrub are the most prevalent fire adapted natural community type found within the conservation area. The majority of these plant communities, at the time of acquisition were managed for commercial silviculture and pine coverages included primarily slash pine (*Pinus elliottii*) and some sand pine (*P. clausa*). Restoration driven management techniques implemented within these areas includes clearcut harvesting of sand pine, thinning of slash pine, roller chopping, and prescribed burning. The mesic and wet flatwoods plant communities within the conservation area vary in levels of disturbance. While species compositions are largely appropriate, these areas tend to have contiguous and overgrown shrub and sub canopy layers with many areas exhibiting suppressed groundcover assemblages. The more xeric areas (scrubby flatwoods, scrub, and sandhill) are highly disturbed. Most areas include suppressed/remnant groundcover assemblages. Shrub layers within portions of the scrub and scrubby flatwoods are altered from past management activities that included oak removal.

Though sand pine dominated scrub is a fire-adapted community, it is a unique pine community in its relationship with fire. Rather than promoting the survival of the individual tree with insulating bark, sand pine has adapted to protect the species/forest with serotinous cones. Sand pine burns relatively infrequently, with tremendous intensity in a stand-replacing crown fire. This intense fire kills most of the existing sand pines, top kills other woody species on the site, and heats the serotinous cones so they open and release their seeds. With the mortality of the existing sand pine canopy and the consumption of other foliage and vegetative debris, the sand pine seeds fall on nearly bare sand. The seeds can then germinate and become established with little competition.

Several areas within the conservation area include a sand pine coverage, however, the extreme fire behavior resulting when sand pine burns is not something easily managed nor something easily controlled. Therefore, the District may use mechanical means as an alternative to prescribed fire in order to manage this community. Mechanical alternatives may include clearcut harvest operations, roller chopping, and mowing. These mechanical treatments are used by many other agencies managing sand pine and have been proven effective. It is important to note that while these treatments might be effective at removing and/or rearranging fuel loads, it is not an exact ecological surrogate for fire and prescribed fire should be used in conjunction with these activiries.

Fire management within the remaining plant communities (below) will be in conjunction with the associated dominant pyric plant community within each fire management unit (FMU). These plant communities will burn as site conditions permit during the implementation of controlled burns in adjacent plant communities. Additionally, these areas will not be excluded from fire activities unless warranted by safety or smoke management issues.

Depression and basin marshes are fire-adapted communities. Though fire may not carry entirely through each marsh during every burn, it is an important factor in the maintenance of the edge habitats surrounding them. These marshes are embedded within in the upland areas at the conservation area. In general, marsh fires are carried through the herbaceous layer. Many of these marshy areas have been disturbed by a prolonged absence of fire and are encroached by hardwoods or include planted pine. These areas still occupy an important niche in providing habitat for numerous species of wildlife. Fire will be applied to these marshes any time surrounding natural communities are burned.

Dome swamps are scattered throughout the flatwoods at the LGCA. Many of these domes have been altered to some extent by past silvicultural activity and subsequently, many are missing the characteristic "bands" of vegetation normally found in the shallow outer edges of the domes. Fire will be applied to dome swamps as the adjacent communities are burned.

The basin swamp is not a primary target for fire management at the LGCA; however, this natural community grades into flatwoods communities, which are fire dependent. Basin swamps are considered fire influenced, because while they do support fire at some frequency, fire has the potential to have rather extreme effects. Under normal hydrologic conditions, fire will burn the edges of this community type without penetrating to the center. This is the desired effect of fire within the basin swamp, as it will prohibit the expansion of hardwoods and shrubs into the adjacent flatwoods.

The single example of wet prairie, by nature of it's location within the conservation area is not a primary target for fire management. Only a portion of the wet prairie and associated water body occur on District property. Fire is exceedingly important in the maintenance of this plant community and will be burned in conjunction with the adjacent flatwoods.

Sandhill upland lake and flatwoods lake communities are not primary targets for fire management at the LGCA; however, these communities are fire influenced. While fire will not carry across the entire community due to the presence of open water, fire is important in the maintenance of vegetated edges. Fire will be applied to these areas as adjacent communities are burned.

# Seasonality and Type of Fire

Historically, most fires in Florida occurred in what is commonly referred to as the "growing season." The growing season usually spans from mid March through August. Fires during the spring and early summer months generally have significant ecological benefits as most fire-adapted flora is perpetuated by fire. Mimicking lightning ignited natural fires by implementing prescribed fire during the growing season provides benefits to natural systems by controlling shrub layers and encouraging diversity in groundcover species.

Dormant season burns, conducted from mid November through the mid March, are less intense than growing season burns and are a desirable alternative when igniting fire in young pine plantations. Additionally, dormant season burns help to reduce fuel loads in overgrown areas, resulting in fewer safety and smoke management issues. Fuel loads range widely across the conservation area, but are moderate to high. While thousands of acres have been treated with prescribed burns, or been impacted by wildfires, the affects of long-term fire exclusion prior to the District purchase of the LGCA have not been overcome. These effects include: increased fuel loads, increased dominance of shrubby plants, decreased abundance of herbaceous plants, and shift in species. The District has worked, and intends to continue, to restore the natural distribution and abundance of plant and animal species through the use of prescribed fire and mechanical manipulations. It may take several iterations of fire and likely the addition of mechanical treatments to reduce shrub heights across much of the conservation area.

The current fuel conditions may require that some of the initial applications of fire be in the form of dormant season burning. This will allow for the reduction of fuel loads while providing for the protection of desirable vegetation. The ultimate goal of this strategy will be to move the prescribed fire application into a growing season rotation. District staff anticipate the implementation of growing season burns

In many cases, fire management units with similar fire management needs may be burned simultaneously, either with crews igniting the areas by hand from the ground, or with the aid of aircraft. Aerial ignition allows District staff to ignite fire management units more quickly, resulting in a faster burnout. In an area with a large mosaic of unavailable fuels, fire can be applied easily to all portions of the unit. With ground based crews this sometimes is infeasible or impossible and may pose a safety issue. An aerial burn safety plan (Exhibit 1) will accompany the individual burn prescriptions and be onsite and on the ground the day of any aerial burn.

# Wildfire Policy

In the event of a wildfire, if conditions permit, suppression strategies will utilize existing fuel breaks to contain the wildfire. These fuel breaks may include previously burned areas, existing roads, trails, and firelines, and wetlands and other water bodies. This is only possible, with the agreement of local fire rescue, Florida Forest Service, District staff, and when all of the following conditions are met:

Fuels within the area have been managed
 No extreme weather conditions are present or expected
 There are no other wildfires that may require action
 There are sufficient resources available to manage the fire to containment
 The fire and the resulting smoke will not impact neighbors or smoke sensitive areas

If any of these conditions are not met, direct suppression action will be taken.

# As soon as possible following a fire in which firelines are plowed, a plan for fireline rehabilitation shall be developed and implemented.

Persons discovering arson or wildfires on the Conservation area should report them to the Florida Department of Agriculture and Consumer Services, Florida Forest Service, the St. Johns River Water Management District, or by dialing 911.

# Post Burn Reports

Burn reports must be completed after each controlled burn or wildfire. These reports include detailed information regarding the acreage, fuel models, staff and equipment hours, cooperator hours, contractor hours, weather (forecasted and observed) and fire behavior. The timely completion of these reports is necessary for the compilation of information relative to the entire District burn program. Additionally, these reports provide a documented account of site specific conditions which are helpful in the planning of future burns.

# Smoke Management

A significant challenge to the implementation of any prescribed burn program is smoke management. Since the writing of the last plan in 2006, includes a total of 12 prescribed burns covering 3,515 acres and 19 wildfires covering 1,592 acres have occured. Figure 2 illustrates the fire history since 2006. Fuel loads across the conservation area are moderate to high (with low levels in the areas of recent wildfires). This accumulation of fuels has the potential to produce a tremendous amount of smoke as areas are burned. As the surrounding areas become increasingly urbanized, this problem will increase in magnitude, as there become fewer acceptable places to maneuver a smoke column from a prescribed fire.

The LGCA has a limited smoke shed in which to place a smoke column from a prescribed fire. There are smoke sensitive areas that surround the conservation area and effect the smoke management of each burn unit. Smoke management is a limiting factor in the application of prescribed fire with in the conservation area. Smoke management considerations include US 17, several residential areas, and the effects of Lake George and the numerous branches within the conservation area. Additionally, many of the roads that traverse the property are well-used local roads. Figure 3 illustrates smoke sensitive areas in relation the LGCA. As development increases in the area, fire management will become more difficult. Increasing daily traffic on US 17, which is likely to be widened within the scope of this plan, will further impair the District's ability to implement prescribed burns at the appropriate fire return intervals within the conservation area. Currently, this property still has an acceptable smoke shed into which to place a smoke column from a prescribed fire.

Most of the Lake George Conservation Area lies within an area of closed airspace (2907A). The airspace is closed to provide the US Navy with unfettered access to their bomb target within the lake itself. The District has entered into an agreement with the US Navy to allow the District to use aircraft for prescribed burning, but the days available for aerial ignition are limited and require prior coordination with the Navy. This further complicates the District's ability to accomplish the prescribed burn goals for the LGCA.





A smoke screening process will be completed with each prescription, before an authorization is obtained from the Florida Forest Service. A fire weather forecast is obtained and evaluated for suitable burning conditions and smoke management objectives. A wind direction is chosen that will transport smoke away from urbanized areas and/or impact these smoke sensitive areas in the least possible way. When possible, the smoke plume from burns should be directed back through the conservation area or over the ocean. Smoke can then mix and loft into the atmosphere over uninhabited or rural land adequately enough to minimize off-site impacts.

On burn day, the ability of smoke to mix and disperse into the atmosphere should be good. Dispersion indices should be above 35. Dispersions of greater than 69 will not be utilized unless other weather conditions mitigate expected fire behavior. Forecast mixing heights should be above 1700ft. Transport winds should be at least 9 mph to effectively minimize residual smoke. Lower transport wind speeds can be utilized if dispersion index and mixing heights are above average. Burns will be conducted with a carefully plotted wind direction to limit and/or eliminate negative impacts from smoke to neighbors and urbanized areas.

# Mechanical and Chemical Treatments

Short and long term weather conditions and urban interface issues are important considerations when implementing a prescribed fire program. Weather conditions such as extended droughts or insurmountable smoke management issues due to increased urbanization may require the District to manage natural systems mechanically and/or chemically. A variety of methods including mowing, roller chopping, and herbicide applications may be incorporated as alternatives to prescribed fire.

Many of the pyric plant communities within the conservation area are dominated by pine plantations. An integral component to the implementation of a successful prescribed fire program within the LGCA is the harvesting of planted pine. Harvesting of pine trees will provide safer conditions for prescribed fire staff and decrease the potential for fire related mortality to the remaining pines and other desirable vegetation. Prescribed fire activities are planned for the conservation area over the next ten years and will be conducted in conjunction with annual burn plans and in coordination with harvest plans.

Some of the pyric plant communities within the LGCA include sand pine. Due to the catastrophic nature of fire within mature sand pine dominated systems, prescribed fire will not be attempted in these areas prior to harvesting.

# Legal Considerations

Only burn managers certified by Florida Forest Service will approve the unit prescriptions and must be on site while the burn is being conducted. Certified burn managers adhering to the requirements of State Statute 590.026 are protected from liability for damage or injury caused by fire or resulting smoke, unless gross negligence is proven.

## Fire Management Units

Fire management units (FMUs) have been delineated on the LGCA. Where logical, the District used existing timber stand boundaries and landscape features to delineate fire management units. In many cases, individual timber stands represent the smallest areas of land that are free of roads, trails, or other barriers to fire. Occasionally, several fire management units with similar fire needs will be burned simultaneously and stand lines provide a break in fuels so that staff may burn smaller areas than initially planned if needed. Additionally, in an effort to mitigate smoke management and potential urban interface issues, fire management units may be smaller in size than on other parcels or conservation areas.

Ideally, District staff would thoroughly address and describe each fire management unit in terms of its fire management needs. Though all units within the bounds of the conservation area are somewhat different, all can be categorized into one of several fuel model (FM) descriptions. The thirteen standard fuel models (as described in Hal E. Anderson's *Aids to Determining Fuel Models For Estimating Fire Behavior*) were used as a basis for this categorization. The factors considered in determining each FM are: amount, composition and arrangement of available fuels within units, predicted fire behavior within each unit (under conditions acceptable to implement a prescribed burn), and resources necessary to regain management of a fire in extenuating circumstances. District staff anticipates the change of vegetative assemblages over time due to growth and/or restoration and understand that fuel characteristics, models, and resulting fire behavior will also change.

Below is a brief description of each fuel model occurring within the LGCA and associated natural communities. A detailed description of each individual fire management unit and its associated objectives will be included in the individual prescriptions. Some fire management units within the conservation area contain multiple FMs. In these instances, the designated FM is dominant in coverage. Figure 4 illustrates the FM associated with individual fire management units.

The original thirteen fuel models were developed for surface fires only. They did not attempt to model crown fires. Therefore, at certain ages and fuel moisture regimes there is no fuel model that described the fire behavior that can be anticipated for a fire burning through sand pine. During times of high fuel moistures, sand pine will not burn and may actually serve as a natural barrier to fire. During dry times, the entire canopy of the sand pine will burn with extremely high rates of spread and long flame lengths.

## Fuel Models

# Fuel Model 1

This category includes fire management units within the conservation area that can best be described as improved pasture. Fires in these fuels are spread through the short herbaceous layer, is rapid, and will be most likely to carry fire when cured as grazing activities restrict the accumulation of thatch.

# Fuel Model 2

This category includes fire management units within the conservation area that can best be described as sandhill and includes only those areas that retain an herbaceous groundcover. Fires in these fuels are typically spread through the herbaceous layer and have an overstory of longleaf pine, and offsite slash and sand pine, as well as turkey oak. Given appropriate wind speeds and fuel moisture conditions, fire spread can be very rapid. The optimal fire return interval in this fuel model is approximately every 1-3 years with growing season burns being preferred.

# Fuel Model 4

This category includes fire management units within the conservation area that are best described as scrub and scrubby flatwoods. Fire intensity and fast spreading fires involving foliage and live and dead fine woody materials in the crowns of a nearly continuous secondary overstory characterize Fuel Model 4. Besides flammable foliage, there is dead woody material in the stand that significantly contributes to fire intensity.

# Fuel Model 7

This category includes fire management units that are best described as mesic and wet flatwoods, both natural and planted pine. Fire in these fuel types is spread through both the shrub and herbaceous layers. The shrub layer components present within the fire management units of this FM include saw palmetto, gallberry and other ericaceous shrubs between 3 and 6 feet tall and are contiguous across many of the units. The herbaceous layer is generally suppressed, but includes wiregrass. The optimal fire return interval for this FM is approximately every 2 to 4 years. Growing season burns are preferable; however, some units of this FM will require dormant season burns and/or mechanical treatments.

## Exhibit 1 Aerial Burn Safety Plan Lake George Conservation area

The hazards associated with this type of burning are related to working with the helicopter, the sphere dispenser, and dealing with active fire. All helicopter safety procedures and all district fireline policies and procedures will be followed.

- **1. BRIEFING -** During the operational briefing the safety plan will be reviewed with all personnel on the burn.
- 2. **HELICOPTER SAFETY** The pilot will give a helicopter safety briefing at the morning operational briefing.
- **3. AIDS SAFETY** The operator will review the operation and cleaning procedures for the dispenser at the morning briefing.
- 4. **PERSONAL PROTECTIVE EQUIPMENT** The incident commander will ensure that all personnel have the required PPE.
- 5. HIGH HAZARD AREAS All high hazard areas such as power lines shall be designated on the map and attached to the burn plan.
- 6. EMERGENCY LANDING ZONES These should be confirmed with the pilot and indicated on the burn map. Helispot Lattitude \_\_\_\_\_\_"N Longitude \_\_\_\_\_"W

## **CRASH RESCUE PLAN**

In the event of an accident involving the helicopter the following procedures will be followed.

#### **INCIDENT COMMANDER or BURN BOSS**

- 1. Notify 911
- 2. Notify Putnam County Fire Rescue (386) 329-0479
- 3. Notify Putnam Sheriff's Office (386) 329-0800
- 4. Notify Volusia County Fire Rescue (386) 252-4900
- 5. Notify Volusia County Sheriff's Office (386) 736-5961
- **6.** Assume responsibility of the Rescue Operation.
- 7. Notify NTSB (305-957-4610 OR 404-462-1666)
- 8. Delegate responsibility of fire control to the second in command or the most qualified.

#### SECOND IN COMMAND

- **1.** Assume responsibility of the burn.
- 2. Assist the IC or Burn Boss with resource and personnel needs for the rescue operation.
- **3.** If the IC is in the helicopter, second in command will assume rescue operation responsibilities and assign the most qualified to fire control.

#### Level I Trauma Center

	<ol> <li>Halifax Daytona</li> <li>Shands Gainesville</li> </ol>	386-254-4000 352-265-0111
DIVISION (	DF FORESTRY	
	1. Bunnell Dispatch	904-446-6786
	2. Wacasassa Dispatch	352-955-2010
<u>SJRWMD</u>	1. Land Management	386-329-4404
NTSB	<ol> <li>Southeast Regional Office</li> <li>Southeast Field Office</li> </ol>	305-957-4610 404-462-1666

# Addendum 4 Detailed Forest Management Activity Schedule

STANDID	Species	Acres	Year Established	Harvest Type	Harvest Year
2218066	SL	11	1973	3	2011
2218067	$\mathbf{SL}$	48	1973	3	2011
2229053	SL	8	1984	3	2012
2229017	SL	65	1969	3	2012
2229018	SL	8	1961	3	2012
2227077	SL	24	1962	3	2012
2227083	SL	5	1958	3	2012
2229037	SL	21	1980	3	2012
2228075	SL	4	1988	3	2012
2229015	SL	20	1971	3	2012
2229022	SL	10	1971	3	2012
2229035	SL	13	1971	3	2012
2230035	SL	32	1975	3	2014
2227100	SL	80	1961	3	2014
2228012	SL	15	1984	3	2015
2228021	SL	3	1984	3	2015
2228026	SL	11	1985	3	2015
2211036	SL	30	1963	3	2016
2228066	SL	5	1983	3	2016
2211029	SL	21	1976	3	2016
2228052	SL	26	1983	3	2016
2228069	SL	9	1983	3	2016
2228060	$\mathbf{SL}$	5	1983	3	2016
2227049	$\mathbf{L}\mathbf{L}$	35	1965	4	2016
2227054	SL	19	1958	4	2016
2210001	SL	68	1987	3	2017
2210033	SL	18	1989	3	2017
2210066	SL	2	1979	3	2017
2210062	SL	18	1987	3	2017
2210064	SL	7	1970	3	2017
2210004	SL	34	1979	3	2017
2210006	SL	216	1987	3	2017
2203015	SL	25	2000	2	2018
2203019	SL	43	2000	2	2018
2203031	$\mathbf{SL}$	45	2000	2	2018
2203030	SL	10	2000	2	2018
2230014	SL	15	2000	2	2018
2218006	SL	32	1986	3	2018
2218007	SL	68	1988	3	2018
2218016	$\mathbf{SL}$	16	1985	3	2018
2218037	$\mathbf{SL}$	4	1973	3	2018
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Lake George Conservation Area Harvest Plan (2011-2021)

STANDID	Species	Acres	Year Established	Harvest Type	Harvest Year	
2218039	SL	36	1989	3	2018	
2218063	SL	8	1987	3	2018	
2218005	SL	35	1988	3	2018	
2218001	SL	93	1986	3	2018	
2230033	SL	47	1987	3	2019	
2230120	SL	4	1987	3	2019	
2230047	SL	11	1987	3	2019	
2230122	$\mathbf{SL}$	11	1990	3	2019	
2230130	SL	4	1986	3	2019	
2230081	SL	14	1988	3	2019	
2230061	SL	10	1986	3	2019	
2230099	SL	17	1987	3	2019	
2230121	SL	16	1986	3	2019	
2230051	SL	3	1986	3	2019	
2230128	SL	13	1990	3	2019	
2230063	SL	185	1988	3	2019	
2230091	SL	179	1988	3	2019	
2230092	SL	13	1988	3	2019	
2227113	SL	11	1977	3	2019	
2230052	SL	20	1986	3	2019	
2227080	SL	19	1977	3	2019	
2230029	SL	6	1986	3	2019	
2201031	SL	2	1967	2	2020	
2201002	SL	35	1967	2	2020	
2201004	SL	38	1970	2	2020	
2201014	SL	39	1969	2	2020	
2201020	SL	49	1962	2	2020	
2229047	SL	14	1983	3	2020	
2229048	SL	2	1979	3	2020	
2229071	SL	27	1983	3	2020	
2229019	SL	33	1985	3	2020	
2229039	SL	11	1983	3	2020	
2229043	SL	1	1983	3	2020	
2227094	SL	2	1977	3	2020	
2229044	SL	16	1985	3	2020	
2227097	SL	2	1977	3	2020	
2229086	SL	10	1979	3	2020	
2229016	SL	162	1985	3	2020	
2207002	SL	25	1989	2	2021	
2207047	SL	10	1984	3	2021	
2211067	$\mathbf{SL}$	9	1991	3	2021	
2203008	SL	19	1989	3	2021	
2211064	SL	27	1989	3	2021	

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STANDID	Species	Acres	Year Established	Harvest Type	Harvest Year	
2211066	SL	21	1989	3	2021	
2207016	$\mathbf{SL}$	10	1989	3	2021	
2203009	$\mathbf{SL}$	21	1988	3	2021	
2207010	$\mathbf{SL}$	38	1988	3	2021	
2203011	$\mathbf{SL}$	13	1986	3	2021	
2228043	$\mathbf{SL}$	14	1988	3	2021	
2228050	SL	12	1986	3	2021	
2228074	$\mathbf{SL}$	6	1989	3	2021	
2228071	$\mathbf{SL}$	1	1949	3	2021	
2228072	SL	3	1988	3	2021	
2228073	$\mathbf{SL}$	2	1986	3	2021	
2228038	SL	16	1990	3	2021	
2228035	$\mathbf{SL}$	14	1989	3	2021	
2207041	$\mathbf{SL}$	6	1988	3	2021	
2207056	$\mathbf{SL}$	24	1989	3	2021	
2207074	$\mathbf{SL}$	7	1989	3	2021	
2228049	SL	1	1949	3	2021	
2228048	$\mathbf{SL}$	5	1988	3	2021	
2228046	SL	6	1986	3	2021	

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Harvest Type Codes 1 – clearcut; 2 –  $1^{st}$  Thinning; 3 –  $2^{nd}$  Thinning; 4 –  $3^{rd}$  Thinning

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