

Geneva Wilderness Area

Land Management Plan

2020



GENEVA WILDERNESS AREA LAND MANAGEMENT PLAN

TABLE OF CONTENTS

INTRODUCTION	1
WILDERNESS AREA OVERVIEW	1
REGIONAL SIGNIFICANCE	1
ACQUISITION HISTORY	1
NATURAL RESOURCES OVERVIEW	3
NATURAL COMMUNITIES.....	3
<i>Table 1. Approximate acreage for each plant community and percent uplands and wetlands.</i>	<i>4</i>
WILDLIFE	6
CULTURAL RESOURCES.....	6
SOILS	6
WATER RESOURCES	7
IMPLEMENTATION.....	9
RULES AND REGULATIONS	9
RESOURCE MANAGEMENT PROGRAM.....	9
MONITORING	9
RESTORATION AND HABITAT ENHANCEMENT	9
FIRE MANAGEMENT.....	10
<i>Table 2: Natural Community and Fire Return Interval.....</i>	<i>11</i>
WILDLIFE	11
LISTED SPECIES.....	11
INVASIVE SPECIES	13
LAND USE MANAGEMENT	14
PUBLIC ACCESS	14
RECREATION	14
ENVIRONMENTAL EDUCATION.....	14
SECURITY	15
REFERENCES.....	17

TABLE OF FIGURES

FIGURE 1: LOCATION MAP	2
FIGURE 2: NATURAL COMMUNITIES MAP	5
FIGURE 3: SOILS MAP	8
FIGURE 4: FIRE HISTORY MAP.....	12
FIGURE 5: RECREATION MAP.....	16

LAND MANAGEMENT PLAN SUMMARY

Geneva Wilderness Area

Acres: 175

Location: Geneva, Florida, Section 33, Township 20 South, Range 32 East

Dates of Acquisition: November 30, 1994

Key Resource Issues: The property was previously owned by the Boy Scouts of America and used as a regional campground. Most of the plant communities remain intact with the exception of an area of improved pasture located at the front (north) of the property. There are a series of connected flatwoods lakes in the middle of the property. The Little-Big Econ State Forest is located on the southern boundary of the property. A spur to the Flagler trail crosses the property, exiting at the southern boundary into the Little-Big Econ State Forest.

GENERAL DESCRIPTION:

- **Security** – There is a caretaker residence on-site near the entrance of the property. A law enforcement officer is usually the occupant.
- **Fire** – The property is divided into 14 burn zones. Prescribed burning on the property was initiated in 1999 and continues today. All established burn zones have been burned at least once.
- **Invasive Species** – There are a number of invasive plant species on this property including coral ardisia, tuberous sword fern, and Chinese tallow.
- **Wildlife and Plants** – Occasionally, a Sherman’s fox squirrel (*Sciurus niger shermani*) is observed, possibly coming from the adjacent Little-Big Econ State Forest. Other species of interest are sandhill cranes, various wading birds, eastern diamondback rattlesnakes, and gopher tortoises.
- **Environmental Education** – The Ed Yarborough Nature Center (EYNC) provides educational programs, classes, hikes and special events for the public.

Key Land Use/Recreation Issues: This wilderness area provides opportunities for a variety of recreational uses including hiking, biking, horseback riding, group camping, fishing and wildlife viewing.

- **Access** – There are two access areas, the main entrance on N. County Road 426 and a secondary trail (Flagler Trail) entrance from the southern end of the wilderness area through the Little-Big Econ State Forest (hikers, bikers, horseback riders).
- **Public recreation** - The property is open to the public for nature study, hiking, fishing, camping, horseback riding, and biking.

**Geneva Wilderness Area
Geneva, Florida**

LAND MANAGEMENT PLAN

INTRODUCTION

This document provides guidelines for land management activities to be implemented within the Geneva Wilderness Area over the next ten years. This is the second land management plan for this property.

WILDERNESS AREA OVERVIEW

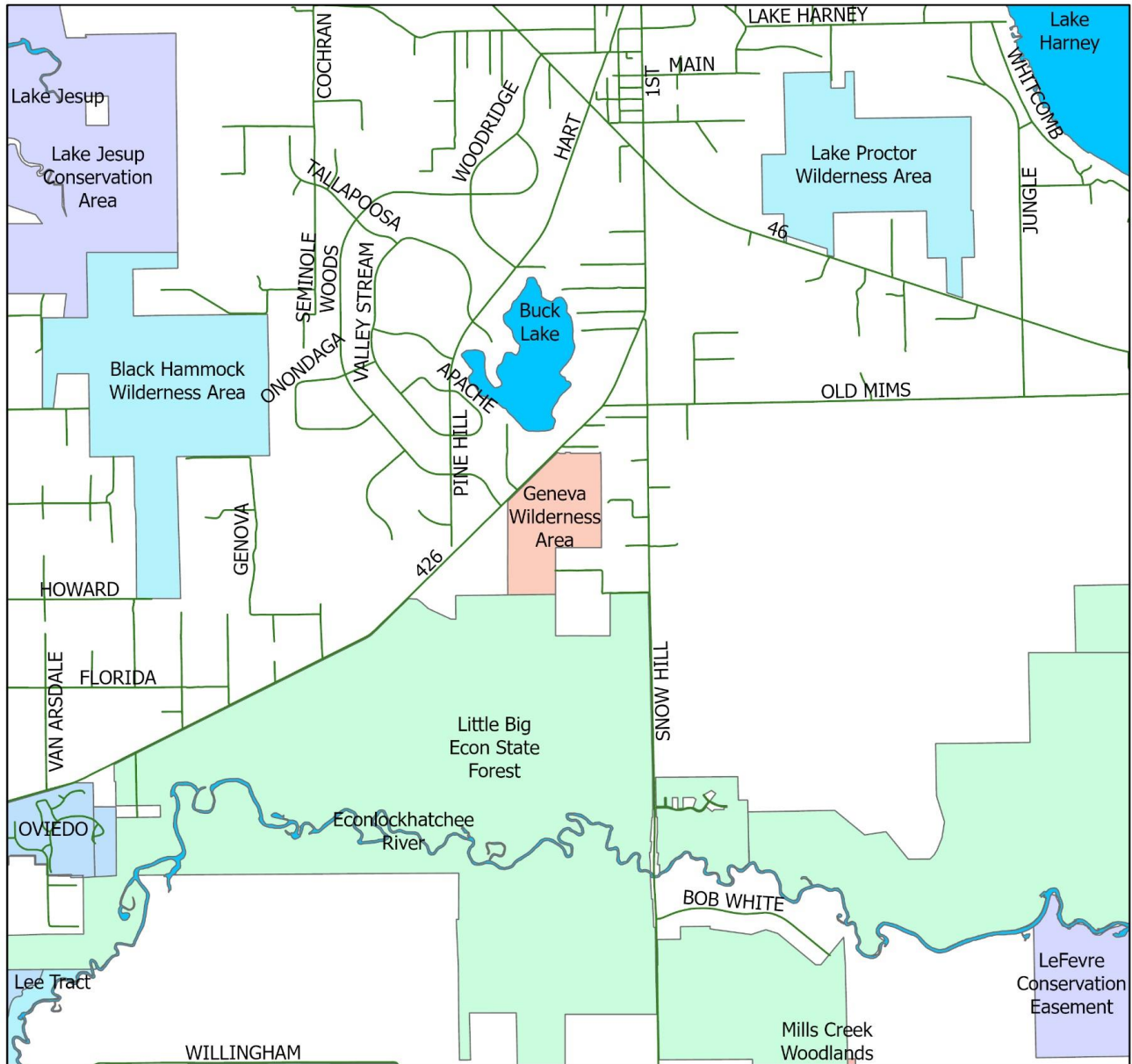
Regional Significance

Geneva Wilderness Area (GWA) is a 175-acre natural area located in the eastern portion of Seminole County. GWA extends the north end of the wilderness corridor provided by the Little-Big Econ State Forest that reaches south into Orange County. The property protects wetlands and scrub communities within its boundary and offers a wilderness experience in an area where development pressure is increasing.

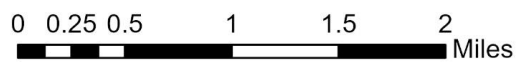
The Seminole County Board of County Commissioners directed staff to create the Ed Yarborough Nature Center (EYNC) at Geneva Wilderness Area in 2001 to provide an epicenter for all environmental education programs. This includes classes, field trips, guided hikes, and programs for K through 12. EYNC also has live animal displays, a collection of animal skulls, interpretive posters and a microscope station.

Acquisition History

In 1994, Seminole County entered into an acquisition agreement with the Central Florida Council of the Boy Scouts of America, Inc., for the purchase of approximately 175 acres in Geneva, Florida. In order to meet gopher tortoise mitigation requirements of the Florida Game and Freshwater Fish Commission (now Florida Fish and Wildlife Conservation Commission), Alaqua Lakes Development Company proposed to fund approximately 20 acres of the acquisition cost on this purchase for gopher tortoise mitigation. The final closing occurred on November 30, 1994.

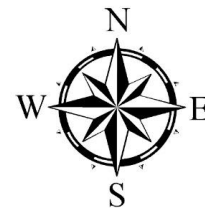


Geneva Wilderness Area
Figure 1: Location Map



Legend

- | | |
|---------------------------------------|-------------------|
| Geneva Wilderness Area | US Forest Service |
| Seminole County/Natural Lands Program | Streets |
| State of Florida/FFS | WaterBodies |
| State of Florida/SJRWMD | City Limits |



NATURAL RESOURCES OVERVIEW

Natural Communities

There are four distinct natural communities that comprise the majority of this property. These are baygall, mesic flatwoods, scrub, and flatwoods lake. There is also an area of improved pasture at the north end of the property, and mesic and xeric hammocks have formed due to fire exclusion and expansion into the pasture, along with successional hardwood forest. Plant communities and fire regimes are taken from FNAI, 2010.

Baygall

There is approximately 39 acres of baygall swamp on the property. The swamp covers most of the east side of the property except for a thin strip of xeric hammock along the east boundary. The overstory consists of loblolly bay (*Gordonia lasianthus*), southern red maple (*Acer rubrum*), laurel oak (*Quercus laurifolia*), swamp black gum (*Nyssa sylvatica*), sweetbay (*Magnolia virginiana*) and swamp bay (*Persea palustris*). Groundcover species include royal fern (*Osmunda regalis*), cinnamon fern (*Osmunda cinnamomea*), lizard's tail (*Saururus cernuus*), netted chain-fern (*Woodwardia areolata*), swamp fern (*Blechnum serrulatum*), and green arum (*Peltandra virginica*). This is not a fire dependent community and only burns under extreme drought conditions.

The baygall on the property is in good condition. Most of the invasive plant infestations on the property occur in this natural community, and continued removal efforts will improve this habitat.

Mesic Flatwoods

Mesic flatwoods are located around the flatwoods lake and also near the area of the north campsite where they grade into scrubby flatwoods. This plant community covers approximately 40 acres. The overstory consists of slash pine (*Pinus elliottii*). Understory is predominantly gallberry (*Ilex glabra*) and saw palmetto (*Serenoa repens*). Other species include shiny blueberry (*Vaccinium myrsinites*), bushy bluestem (*Andropogon glomeratus* var. *glaucopsis*), and St. Johns wort (*Hypericum fasciculatum*). This is a fire dependent community which, according to the Florida Natural Areas Inventory has a fire regime of every 2 to 4 years.

The mesic flatwoods are in decent condition. Most of the flatwoods on the property need more frequent fire, but are otherwise undisturbed.

Scrub

There are approximately 55 acres of scrub, most likely with some component of scrubby flatwoods mixed in. About 32 acres are sand pine scrub, and the remaining 23 acres a mix of oak scrub and scrubby flatwoods. While both sand pine scrub and scrubby flatwoods include sand pine as an overstory species, scrubby flatwoods will usually have longleaf or slash pine as well. Oak scrub has an overstory of scrub oaks, and little to no sand pine. Understory species in the scrub at Geneva Wilderness Area include myrtle oak, Chapman's oak, rusty lyonia (*Lyonia*

ferruginea), scrub bay (*Persea borbonia* var. *humilis*), scrub olive (*Osmanthus megacarpus*) and a minor component of scattered saw palmetto. Ground cover consists of sparse three-awn species (including wiregrass), beaksedges (*Rhynchospora* sp.), and jointweeds (*Polygonella* sp.). There have been historical accounts of Florida scrub-jays (*Aphelocoma coerulescens*) living on the wilderness area. To date, none have been located on site. This is a fire dependent community which may have burned every 10 to 50 years.

The scrub on the property is in good condition, and has been maintained through the use of mechanical treatment and prescribed fire. Due to the proximity of roads, mechanical treatment may continue to be necessary to maintain this habitat, along with fire.

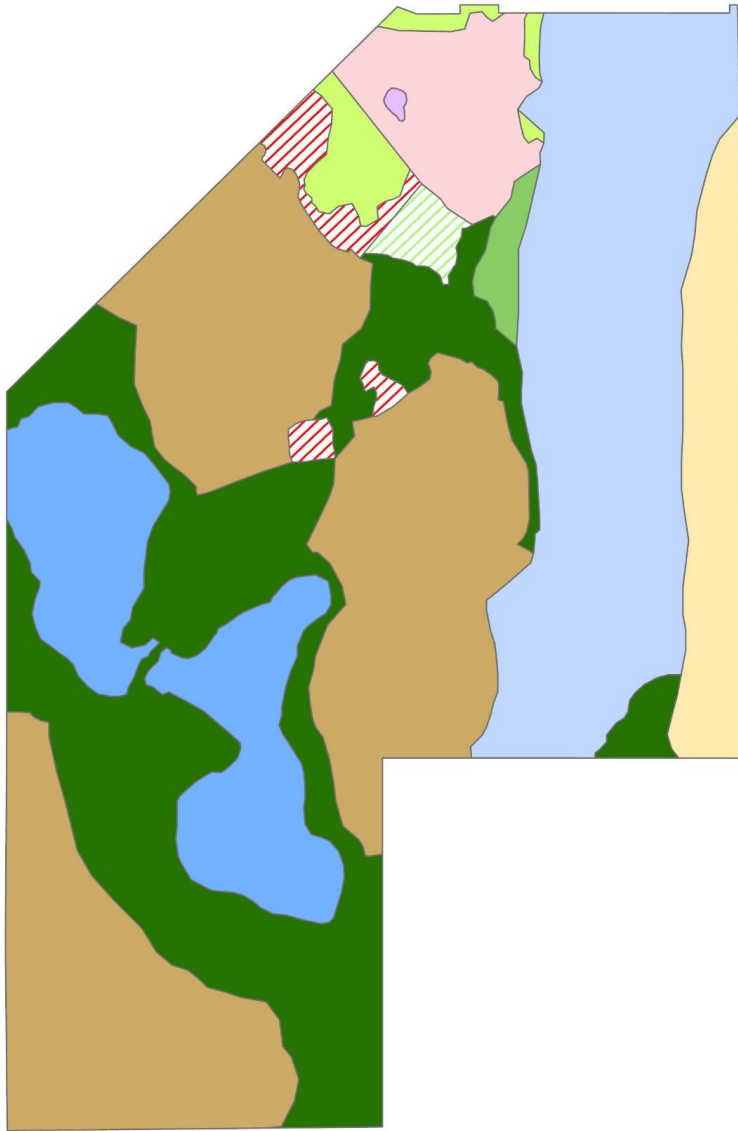
Flatwoods Lake

This natural community extends over approximately 20 acres. When water levels are low, hydrophytic herbaceous plants surround the open water zone that contains spatterdock (*Nuphar advena*). Further upslope, woody vegetation such as saw palmetto (*Serenoa repens*), and piedmont staggerbush (*Lyonia mariana*), pond pine (*Pinus serotina*) surround the lake. This is a fire dependent community and usually burns according to the surrounding mesic flatwoods fire regime of every 2 to 4 years. This keeps the woody shrubs from invading the herbaceous area around the lake.

The flatwoods lake is in good condition, and besides the road and berm through the middle of the lake, is relatively undisturbed. More frequent fire in the surrounding communities would be beneficial.

Table 1. Approximate acreage for each plant community and percent uplands and wetlands.

Community Type	Acres
Scrub	55.3
Baygall	36.7
Mesic Flatwoods	40.5
Mesic Hammock/Upland Hardwoods	1.5
Xeric Hammock	10.3
Flatwoods Lake	19.7
Improved Pasture	7.9
Restoration Area	1.5
Developed Area	3
Depression Marsh	.15
Successional Hardwood Forest	3.4
<hr/>	
Percent Wetlands	31
Percent Uplands	69



Geneva Wilderness Area
 Figure 2: Natural Communities Map



FNAI Natural Communities

-  Baygall
-  Depression Marsh
-  Developed
-  Flatwoods Lake
-  Improved Pasture
-  Mesic Flatwoods
-  Mesic Hammock
-  Restoration Area
-  Scrub
-  Xeric Hammock
-  Successional Hardwood Forest

Wildlife

There are a number of rare and state listed species found on the property including gopher tortoise (*Gopherus polyphemus*), sandhill crane (*Grus canadensis*), snowy egret (*Egretta thula*), and little blue heron (*Egretta caerulea*). Other species observed on the property are white-tailed deer (*Odocoileus virginianus*), raccoon (*Procyon lotor*), river otter (*Lutra canadensis*), marsh rabbit (*Sylvilagus palustris*), fence lizard (*Sceloporus undulatus*), eastern hognose snake (*Heterodon platirhinos*), scarlet snake (*Cemophora coccinea*), six-lined racerunner (*Aspidoscelis sexlineatus*), ground skink (*Scincella lateralis*), golden mouse (*Ochrotomys nuttalli*), and southeastern five-lined skink (*Plestiodon inexpectatus*).

Cultural Resources

According to Seminole County Code, Chapter 190, “All cultural and archeological resources on Natural Lands are protected.” A review of the publication “Cultural Resources Study of Seminole County, Florida: Archaeology Volumes I & II” indicates that there are no known archaeological or cultural sites on Geneva Wilderness Area.

Soils

Astatula

The Astatula series consists of very deep, excessively drained, very rapidly permeable soils on uplands of the South Central Florida Ridge, Southern Florida Flatwoods and a few areas of the Eastern Gulf Coast Flatwoods. They formed in eolian and marine sands.

Basinger

The Basinger series consists of very deep, poorly drained and very poorly drained, rapidly permeable soils in sloughs, depressions, low flats, and poorly defined drainageways. They formed in sandy marine sediments.

Eaugallie

The EauGallie series consists of very deep, very poorly or poorly drained, slowly permeable soils in flats, sloughs and depressional areas in the Southern Florida Flatwoods and to a lesser extent in the Atlantic Coast Flatwoods, the South Central Florida Ridge, and the Southern Florida Lowlands. They formed in sandy and loamy marine sediments in Peninsula Florida.

Myakka

The Myakka series consists of very deep, very poorly or poorly drained, moderately rapid or moderately permeable soils that occur primarily in mesic flatwoods of peninsular Florida. They formed in sandy marine deposits.

Paola

The Paola series consists of very deep, excessively drained soils that formed in sandy marine sediments. Paola soils are on hills, ridges, and flats on marine terraces.

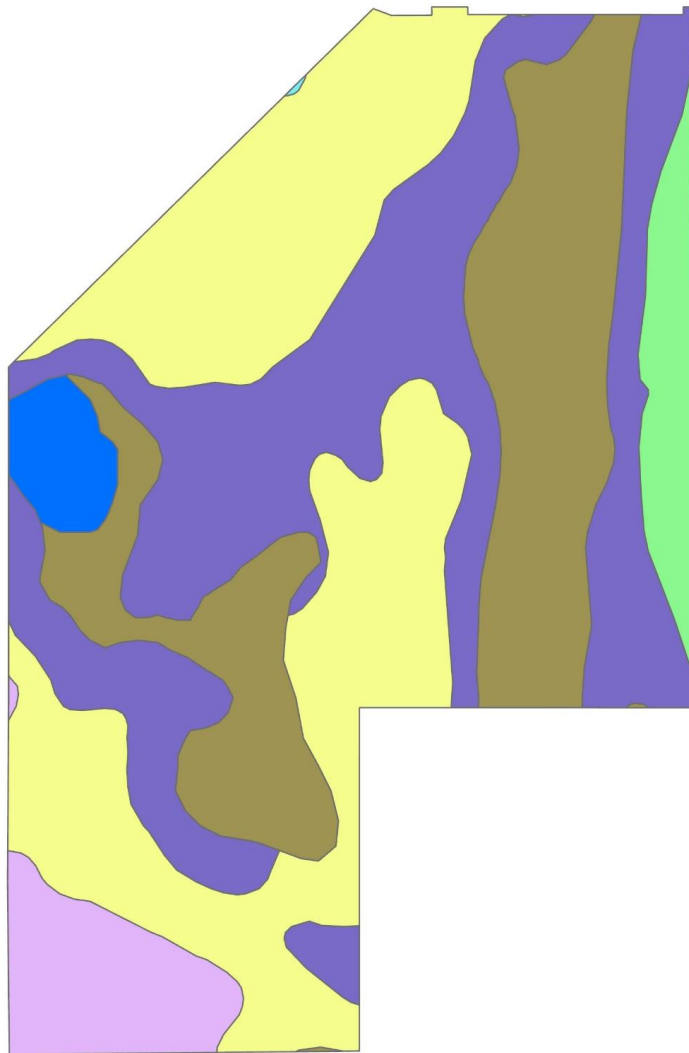
Pomello

The Pomello series consists of very deep, moderately well to somewhat poorly drained soils that formed in sandy marine sediments. Pomello soils are on ridges, hills, and knolls in the flatwoods on marine terraces.

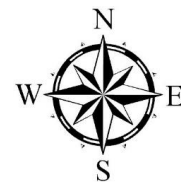
Water Resources

The largest and most apparent water resource at Geneva Wilderness Area is the large flatwoods lake in the middle of the property. This was split by previous owners into two lakes by a road that was constructed to ease access to the south side of the property, but overflows when water is high, and there are two culverts connecting the lakes underneath the road. Water flows into these lakes through piping from Buck Lake north of the property, as well as from surrounding upland habitat.

There is also a small stream that runs through the baygall on the eastern side of the property at certain times of year, and flows south to the Econlockhatchee River. Piping connects the two lakes out to this stream, with water flowing from the lakes to the stream on private property south of the GWA border. A number of small sinkholes dot the scrub, and are usually dry. One small depression marsh is located in the pasture. GWA is located within the Big Econlockhatchee drainage basin.

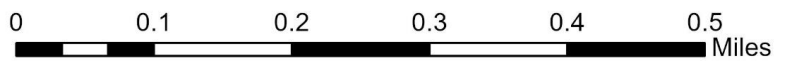


Geneva Wilderness Area Figure 3: Soil Map



Legend

 ASTATULA	 PAOLA
 BASINGER	 POMELLO
 EAUGALLIE	 WATER
 MYAKKA	



IMPLEMENTATION

Integral to the goals and objectives for managing acquired lands in an acceptable manner are protection and restoration of those lands. An important element in protecting the resources is to prevent dumping, poaching, and other illegal activities. Appropriate land management activities, such as prescribed burning, forest management, and removal of exotics, should be continued to protect the viability of the site.

Rules and Regulations

Seminole County Code Chapter 190 Section 4 establishes the provisions relating to management and use of the properties acquired or managed by Seminole County Natural Lands Program.

RESOURCE MANAGEMENT PROGRAM

Monitoring

Monitoring natural resources is an important tool in gauging the overall health of an ecosystem. The Natural Lands Program has developed a monitoring plan that encompasses all sites. From 1996 until June 2004, baseline monitoring was conducted on the property. This included herp arrays, drift fences, cover boards, bird surveys, marking gopher tortoises, photo points, small mammal trapping, fish and turtle traps and bird/bat boxes.

Gopher tortoise populations are monitored by staff via burrow surveys after prescribed burns and mechanical treatment. The data collected from this monitoring effort allow staff to estimate gopher tortoise populations on each property.

Currently, the Natural Lands program hosts a bioblitz twice a year on a different property. A bioblitz occurred at GWA in Fall 2020. The next one is currently scheduled for Spring 2025.

Monitoring Accomplishments

- Gopher tortoise burrow monitoring occurred in 2011, 2015, 2017 and 2019
- Organized a bioblitz in 2020 – 352 new species recorded

Monitoring Strategies

- Continue organizing bioblitzes
- Continue monitoring burrows after mechanical treatment and prescribed fire
- Continue monitoring invasive plant species.
- Establish 5-10 photo points to monitor effects of mechanical treatment and prescribed fire

Restoration and Habitat Enhancement

Restoration of the fire dependent communities is an ongoing process using both prescribed fire and mechanical treatments. A restoration plan was developed for the pasture area and was

implemented in 2006. Survival rates were very low due to drought conditions, and at this point unless increased funding and staffing becomes available, pasture restoration is not a priority. The pasture is currently maintained by mowing twice/year.

Restoration and Habitat Enhancement Accomplishments

- 33.7 acres of scrub were rolled chopping in May 2019

Restoration and Habitat Enhancement Strategies

- Conduct mechanical treatment in scrub as needed
- Consider pasture restoration if funding and staff time becomes available

Fire Management

Fire is an integral part of the Florida landscape. Before the influx of settlers, lightning fires would burn unimpeded through fire adaptive communities and landscapes until extinguished via changes in weather and/or fuel characteristics. Also, Native Americans would burn at various times of the year to attract wild game and to keep the landscape open for easy travel. Today, due to increased urban pressures on conservation areas, fires must be managed under strict regulations and performed according to set criteria depending on the site.

The objective of prescribed burning at Geneva Wilderness Area is to create a mosaic of native plant communities, promote species diversity, and reduce the accumulation of hazardous fuel loads and associated wildfire risks. This would also help to minimize and/or exclude smoke impacts to adjoining or nearby urbanized areas, roads and highways.

The NLP reintroduced fire to the wilderness area in 1999. All of the prepared burn units have been burned at least once. Due to the proximity of County Road 426, prescribed fires are carefully planned using north and northwest winds to avoid smoke impacts on the roadway. There are also challenges due to the location of the EYNC, and the number of camps, meetings, and school groups that visit the property throughout the year.

Geneva Wilderness Area is comprised of a mix of scrub, scrubby flatwoods, and mesic flatwoods. Many of the burn zones comprise more than one of these natural communities, which are burned at different fire return intervals. The mesic flatwoods should be burned every 2-4 years, but scrub can be burned much less often, at an interval of 10-30 years. In zones where both communities exist, the flatwoods should be burned on a regular basis, and fire should be allowed to carry through the scrub where possible. 40% of the burn zones are within the recommended FRI, and including mechanical treatment, 44% of the burn zones are within at least the appropriate disturbance regime interval.

Zones 8 and 11 both have some burnable acres, but the firelines are not currently adequate to consider burning the entire zone. The north section of zone 8 could be burned with 1A. Zone 11 would need a fireline extending further along the south boundary. Zones 10 has minimal fire-type acres, and would need restoration before fire would be a priority for that zone.

Fire Management Accomplishments

- Since 2010, 2 prescribed burns have been completed on the property on 4 burn zones, totaling 22.5 acres

Fire Management Strategies

- Conduct 50% lightning season burns.
- Maintain 70% of the fire-type acres within the recommended FRI
- Build up to .5 mile of new fireline to conduct prescribed fire on an additional 8.4 acres

Table 2: Natural Community and Fire Return Interval

Plant Community	Recommended Fire Return Interval
Scrub	10-30 years
Mesic Flatwoods	2-4 years
Improved Pasture	1-3 years

Fire frequencies based on FNAI.

Wildlife

Continued habitat management through roller chopping, mowing and burning should provide optimum habitat for wildlife species. Wildlife observations will continue to be added to the NLP database.

Wildlife Strategies

- Continue to record wildlife observations.
- Continue land management activities.

Listed Species

There are a number of listed plant and animal species found on this property. Surveys are conducted annually for listed plants.

Plants

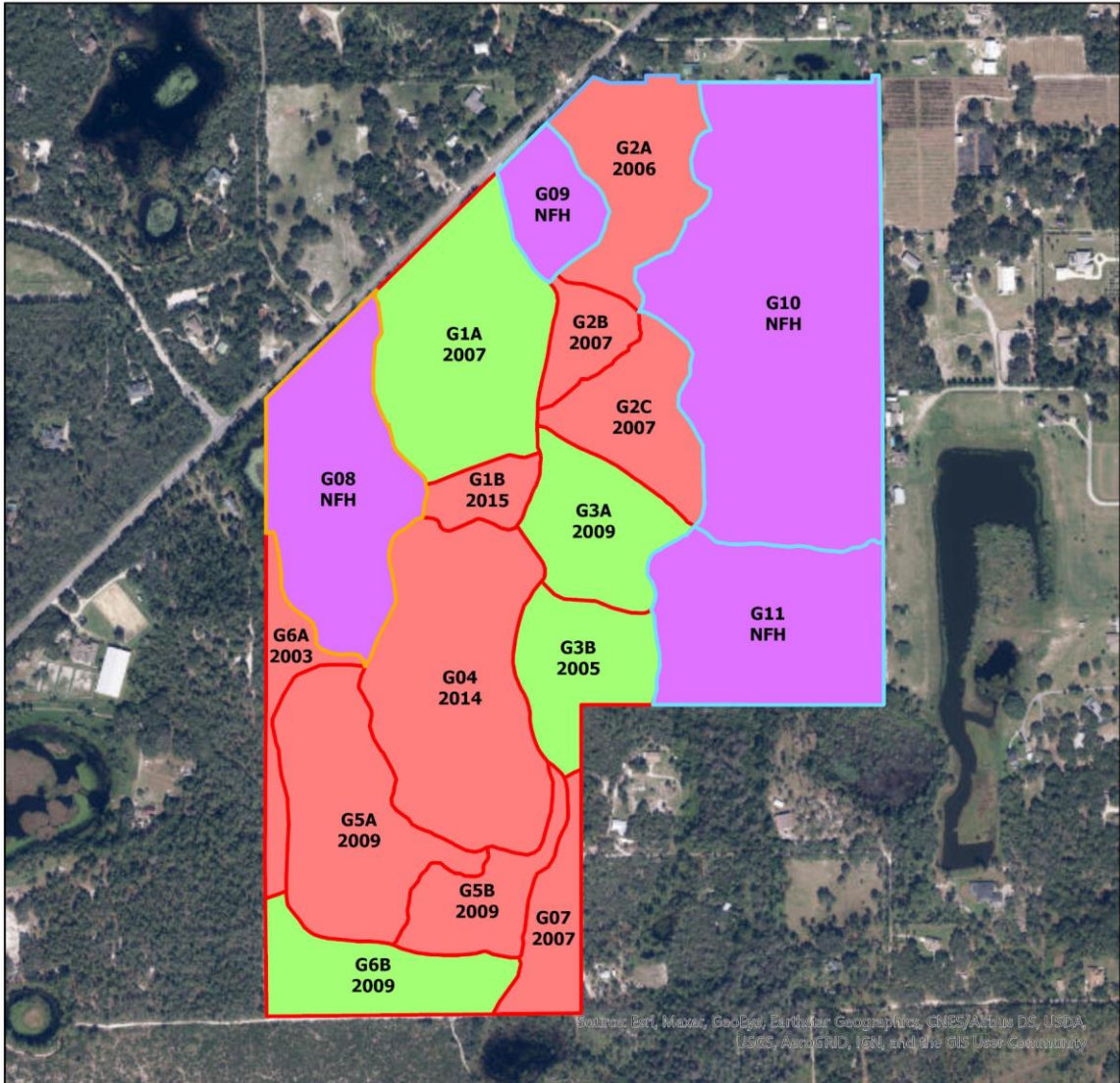
There is one known listed plant species found on the property; garberia (*Garberia heterophylla*), It is listed as threatened by the Florida Department of Agriculture and Consumer Services.

Animals

A variety of listed wading birds use the flatwoods lake to forage. These include the little blue heron and wood stork. Sandhill cranes have been observed nesting in the flatwoods pond. Other listed species include American alligator, bald eagle and gopher tortoise. Natural Lands Program staff and volunteers continue to monitor for gopher tortoises.

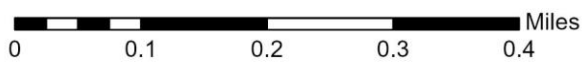
Listed Plant and Animal Strategies

- Continue monitoring for gopher tortoises.
- Continue annual listed plant surveys.



Geneva Wilderness Area Figure 4: Fire History Map

This map shows each management zone, the most recent burn year, and whether or not it is currently maintained within the proper fire return interval (FRI), as well as the priority for maintaining the FRI. NFH = No Fire History



Management Zones

Within FRI, Priority

- N,High
- N,Low
- N/A,Low
- N/A,Medium
- Y,High



Invasive Species

Florida's climate is not only attractive to humans, but also to invasive exotic species. An invasive exotic species is defined as a species introduced to Florida, purposefully or accidentally, from a natural range outside of Florida with the ability to become established outside of cultivation and out-compete native species. Some examples of invasive exotic species in Florida include Brazilian pepper (*Schinus terebinthifolia*), air potato (*Dioscorea bulbifera*), old world climbing fern (*Lygodium microphyllum*), Cogongrass (*Imperata cylindrica*), feral hog (*Sus scrofa*), Cuban brown anole (*Anolis segrei*), nine-banded armadillo (*Dasyurus novemcinctus*), Eurasian collared-dove (*Streptopelia decaocto*), Cuban treefrog (*Osteopilus septentrionalis*), and walking catfish (*Clarias batrachus*). The State of Florida spends millions of dollars each year either directly or indirectly through grants, trying to control invasive exotic species.

Since the impacts of invasive exotic species have both an environmental and economic impact, a non-governmental organization called the Florida Exotic Pest Plant Council (now the Florida Invasive Species Council) was formed. This organization provides a list of Florida's most invasive exotic species. The list is split into two categories: Category I species are those that are altering native plant communities by displacing native species and Category II species are those that have increased in abundance or frequency but have not yet altered Florida plant communities to the extent shown by Category I species. Geneva Wilderness Area has invasive species from both categories.

Plants

Most of the invasive plant species are concentrated in the baygall and mesic hammock on the east side of the property, including coral ardisia and tuberous sword fern. Air potato has been a problem species in the past, but the release of the biocontrol has reduced its cover over the past several years. This 50-60 acre section of the property has received most of the past treatments, and continues to require attention from contractors. After a consistent 2-5 year treatment of the entire area, spot treatments should be feasible by staff, but monitoring will be necessary to determine when this is possible.

There are several invasive grass species found at Geneva Wilderness Area. Natal grass is present on the eastern boundary fireline, and occurs at such low density that sustained mechanical treatment should eradicate this species. Hand-pulling on a regular basis is sufficient, and should occur for the next 2-3 years, after which semi-annual monitoring can take its place.

Scattered patches of cogongrass, Brazilian pepper, tropical soda apple, and other species listed occur on various firelines and boundaries around the property. Staff should monitor for additional or increasingly larger infestations as they patrol.

Animals

The Natural Lands Program has contracted up to 6 nuisance feral hog removal agents at a time. Feral cats and dogs are trapped and turned over to Seminole County Animal Services when observed on the property.

Invasive Plant and Animal Accomplishments since 2010

- 3 contracts for invasive plant removal for a total of 277 acres
- 14 acres treated by NLP staff

Invasive Plant and Animal Strategies

- Keep all Category I invasive species under maintenance control
- Continue feral hog agent program.

LAND USE MANAGEMENT

Public Access

There is one park-and-walk access area located at the north end of the property, directly off County Road 426. During regular business hours, visitors may drive down to the Ed Yarborough Nature Center and park and walk from this point also. There is also a walk-in access point from the Little Big Econ State Forest, that connects to Geneva Wilderness Area through the Flagler trail.

Public Access Strategies

- Continue regular maintenance on public access area.
- Maintain signs and kiosk.

Recreation

Resource-based recreational opportunities provided on this property include hiking, biking, horseback riding, wildlife viewing, and semi-primitive camping (a restroom is available).

Recreation Accomplishments

- The pavilion and fishing pier were constructed in 2015, allowing more picnicking activities, events, wildlife viewing, and fishing. The pavilion also has a semi-primitive group camping site.
- In partnership with Seminole County Public Safety, “safety” or “locator” signs have been installed to assist with emergency response.

Recreation Strategies

- Continue regular maintenance on trails and campsites.

Environmental Education

The Ed Yarborough Nature Center provides opportunities for visitors of all ages to learn about the natural world around them. Programs are offered to schools grades K through 12 and the public in general. Guided hikes and environmental education classes are also offered.

In 2011, an agreement was executed with the Florida Fish and Wildlife Conservation Commission (FWC), establishing the long-term goal of creating a Youth Conservation Center based out of Geneva Wilderness Area, as part of their Florida Youth Conservation Centers Network (FYCCN).

Environmental Education Strategies

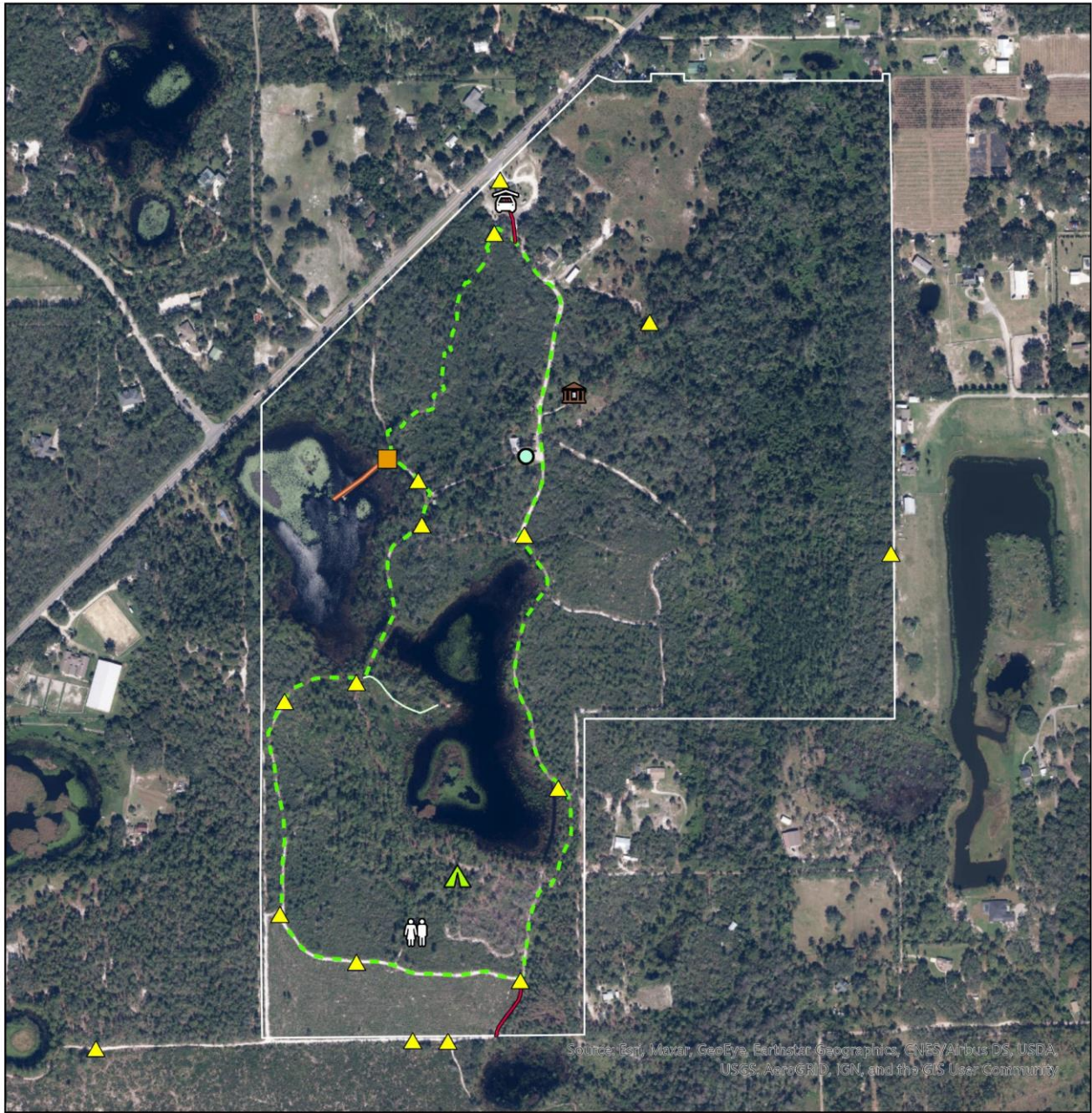
- Continue education programs.
- Establish a Youth Conservation Center in partnership with the FYCCN.

Security

Geneva Wilderness Area has a resident caretaker who routinely patrols the property. The Sheriff's office and FWC are notified of any illegal activity.

Security Strategies

- Continue maintaining resident caretaker on-site.



Source: Earl Mazar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

Geneva Wilderness Area Figure 5: Recreation Map

0 0.05 0.1 0.15 0.2 0.25 Miles



Facilities

- Campsite
- Pavilion
- Pier
- Restroom
- Trailhead/Parking
- EYNC

Trails

- Dock Trail
- Flagler Trail
- Loop Trail
- To Chapel
- Safety Markers

References

Brooks, H.K. 1981. *Guide to the Physiographic Regions of Florida*. Institute of Food and Agricultural Services, University of Florida. Gainesville, FL.

Florida Natural Areas Inventory (FNAI). 2010. *Guide to the natural communities of Florida: 2010 edition*. Florida Natural Areas Inventory, Tallahassee, FL.

Myers, R.L. and John J. Ewel. 1990. *Ecosystems of Florida*. University of Central Florida Press. Gainesville, FL.

Soil Survey Staff, Natural Resources Conservation Service, United States Department of Agriculture. Official Soil Series Descriptions. Available online. Accessed 10/2020.

Wunderlin, R.P. 1998. *Guide to the Vascular Plants of Florida*. The Board of Regents of the State of Florida. Tallahassee, FL.