

# Lyonia Preserve

Volusia County, Fl.



## Trail Guide

## WELCOME

### The Heart of the Matter

Welcome to Lyonia Preserve. Volusia County has dedicated this 380-acre parcel to provide visitors a chance to see and learn about one of Florida's original and unique landscapes.

A major goal of Lyonia Preserve was to restore the scrub plant community to the conditions similar to those that existed here before human intervention, providing suitable habitat for scrub dependant animals. In a natural



scrub ecosystem, fire maintains the ecosystem and prevents any one plant from dominating. Prior to restoration, sand pines and oaks dominated this area and thus, there was a lack of diversity. By utilizing a variety of methods,

the regrowth of the sand pines and oaks were minimized and this restoration area is being managed for scrub plants and scrub dependant animals.

The restored scrub ecosystem that you are about to enter is unlike any found in North America. This is a last remaining relic of a time in which the scrub of western North America was distributed east to the Atlantic Ocean. Over time, climatic changes isolated this habitat from the western scrub, leaving only a few pockets of scrub remaining in Florida. Other important scrub areas in Florida are found in the Ocala National Forest, the Lake Wales Ridge and in coastal areas.

As you enter the Preserve, observe the height of the tall sand pines and density of the oaks. This is an example of what the site looked like before the restoration.

# Rusty Lyonia Trail

## 1. A Friendly Neighbor

The Florida scrub jay (*Aphelocoma coerulescens*) is a 12 inch long crestless jay, which lacks the white-tipped wing and tail feathers of the more common blue jay (*Cyanocitta cristata*). This extremely friendly bird is found only in certain types of scrub habitat and was not present on the site prior to the restoration.



*Aphelocoma coerulescens*

Even though the scrub jays are curious and friendly toward humans, please do not feed them. Their natural diet does not include peanuts, bird seed or bread, so these foods are not nutritionally healthy for them. Supplemental feedings make them dependent on humans and vulnerable to harm. It also gives them a false sense of the carrying capacity of the land which can affect their population size and endanger their survival.. So no matter how much they ask, don't feed them, for their sake.

## It's Not Nice to Fool Mother Nature

Before restoration of the site began, large mature sand pines dominated the property. Below the pines, a very thick understory of oaks, lyonia and saw palmetto limited the movement of most animals. This dense understory also limited the amount of germination of more desirable plant species. Under natural conditions fire would burn through the habitat and return the habitat to a more diverse condition, allowing more non-woody plants to grow. If fire had been excluded for a longer period of time, the area would have changed into a hardwood (oak dominated) community referred to as a xeric hammock. The xeric hammock is not a common natural community in Florida according to some scientists. It is usually a result of human suppression of fires.

## 2. Living on the Edge

Because scrub habitat is naturally uncommon and has been impacted by development and fire suppression, there are a variety of endangered plants and animals that can be found in the scrub habitat. Forty to sixty percent of the species found in scrub are not found in any other habitats. These are called endemic species.

In scrub habitats, there are 22 plant species protected by the State of Florida. Examples of some endangered and endemic scrub plants found in Lyonia Preserve are rosemary (*Ceratiola ericoides*), scrub holly (*Ilexopaca var. arenicola*), silk bay (*Persea humilis*), garberia (*Garberia heterophylla*), and Curtiss' milkweed (*Asclepias curtissii*).



***Garberia heterophylla***

State and federal rules protect 10 species of animals. They include the sand skink (*Neoseps reynoldsi*), blue-tailed mole skink (*Eumeces egregius lividus*), Florida scrub lizard (*Sceloporous woodi*), and the Florida scrub jay (*Aphelocoma coerulescens*). The gopher tortoise (*Gopherus polyphemus*), although typically considered a sandhill species, is relatively common in scrub habitats.

## 3. A Fungus Among Us

Much of the area in scrub is open space with little or no vegetation. Often these areas are vegetated with lichens. Lichens are organisms made up of algae that provide food, and fungi that provide moisture. The lichen commonly found in the scrub is known as deer moss; however, it is not a moss and whether or not deer feed upon it is questionable. You may have already seen these organisms because the model train industry uses deer moss as ornamentation.

## 4. Artificial Preservative

One method that was tried for the restoration was a technique called roller chopping. This procedure is commonly used in forestry operations when pine seedlings are

planted. A large drum with blades is pulled behind a tractor. The blades cut down the vegetation and sever the roots of oaks and other plants. The drum does not turn the soil over as a plow would. Within this 25 acre cell, roller chopping was used to simulate the removal of vegetation after natural fires. Fifty foot strips of vegetation were left for scrub jays to use for feeding, nesting and refuge.



### 5. Catch a Wave

These sandy hills are very similar to the sand dunes along the Atlantic Ocean. Wind and water formed both areas. For much of its geologic history, Florida has been underwater. Climatic changes have caused wide-ranging movement of Florida's coastline. Between the ice ages approximately 2 million years ago, the sea level was higher and a central ridge was all that was left above water. These sandy hills are the remains of dunes that formed along that ancient coastline.

### 6. Apartment Living

The gopher tortoise (*Gopherus polyphemus*) is a medium sized tortoise that inhabits dry, well-drained habitats. The tortoises dig burrows, which sometimes extend as long as 20 feet and 10 feet deep. Gopher tortoises are often called a keystone species. This is because the tortoise provides homes for as many as 300 species of animals, which would suffer without the burrows. Some animals share the burrows, such as the pine snake (*Pituophis melanoleucus*), indigo snake (*Drymarchon corais couperi*), and Florida mouse (*Podomys floridanus*). Some species use the burrow after it is abandoned by the tortoise, such as the gray fox (*Urocyon cinereoargenteus*) and raccoon (*Procyon lotor*). Before Lyonia Preserve was restored, few go-



*Gopherus polyphemus*

pher tortoises were present on the site. This was due to the fact that the historic sand pine scrub habitat prevented the herbaceous growth that the tortoise requires for food.

## 7. Florida's Desert

The soils that support this type of scrub vegetation are excessively well-drained sands. Silt, clay, and organic matter which tend to capture water are limited or absent in these soils. They are, as you may have guessed, also low in nutrients. Because of the rapid percolation of water and low water retention, scrub areas are often called "Florida's Desert", even though these soils and scrub habitat receive approximately the same amount of rainfall as other habitats.

## 8. Suck it Up

Since scrub habitat is xeric (dry), the plants that inhabit this area are well adapted to living in this environment. For example, many plants have small hairs (pubescence),



*Lyonia ferruginea*

trap moisture is rusty lyonia (*Lyonia ferruginea*). These hairs give the new foliage a 'rusty' color, hence the name.

waxy leaves or leaves with edges turned inward. This minimizes the amount of water that is lost through evaporation and tends to trap water found in the atmosphere. An example of

a plant that uses hairs to

The prickly pear cactus (*Opuntia stricta*) is another plant that is especially well adapted to this environment. In order to minimize water loss, the leaves are reduced to spines and the stems are modified into pads that store water. Many scrub species have roots that reach the water table or which spread along the surface of the soil, in order to capture water before it percolates into the ground.

## 9. Deep Impact

Because the soils of this scrub are permeable to water, they are important recharge areas for our underground water supply called aquifers. The surficial aquifer is what most people call the water table. The depth to the top of the surficial aquifer ranges from approximately 50 feet below the surface to 8 feet above ground level, as seen in the wetlands. The Floridan aquifer is found below the surficial and is the main source of drinking water for Central Florida. Because the soils have high percolation rates, the water levels in both aquifers change very quickly in response to rainfall.

## Redroot Trail

## 10. Light My Fire

In this cell a control burn was conducted in April of 1994. Notice that casual observation shows that the same type of plants occur as in the other areas you have seen or are about to see. However, analysis of the plants indicates that the diversity is higher in this area than other cells. Also, the amount of open space is greater in this area. It is easier to walk off the trail. These sandy areas are necessary for the animals of the Florida scrub.

The wetland area within the burn cell also burned. The dead slash pines along the edge of the wetland were not killed directly by the fire. When pine habitats don't burn frequently,



leaf litter builds up and the pines extend their fine feeder roots into leaf litter. Fire, when it does occur, burns the leaf litter and the feeder roots, weakening the tree. Sawyer beetles, able to smell smoke from long distances, rapidly move into the area and start feeding on the weakened tree, eventually killing it.

## 11. Return of the Living Dead

The dead trees that you see standing, as well as the ones on the ground, are referred to as “snags”. They are important to any natural habitat. Many insects feed upon the decaying wood, providing food for woodpeckers and other birds. Birds often use the top of the snag as a look-out point for prey and predator observation. Woodpeckers and other cavity nesting birds use snags for shelter.

Watch for red-bellied woodpeckers (*Melanerpes carolinus*) and red-headed woodpeckers (*Melanerpes erythrocephalus*) which are often seen competing for use of these snags. In the winter months, look for cedar waxwings (*Bombycilla cedrorum*) that frequent this area.

## 12. Here Today Gone Tomorrow



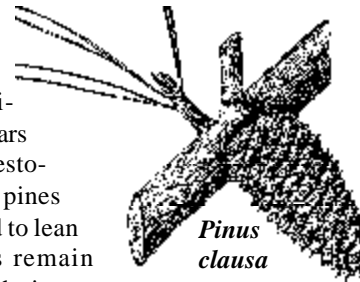
You may be surprised to find a wetland area in the middle of dry scrub. Its presence indicates that the sandy soil indeed does not retain water very well and it collects in areas like you see here. This

type of wetland is referred to as ephemeral. Ephemeral wetlands are areas that disappear and reappear frequently, depending on the amount of rainfall. Because the wetlands on Lyonia Preserve frequently dry up, fish are rare or absent. These types of wetlands are a haven for many insects, amphibians, reptiles and birds. In fact many species of frogs only lay their eggs in ephemeral wetlands. Frogs that you may see or hear while in this area include the pinewoods tree frog (*Hyla femoralis*), pig frog (*Rana grylio*) and Southern leopard frog (*Rana utricularia*).

## 13. The Family Tree

The most common pine tree in Lyonia Preserve is the sand pine (*Pinus clausa*). However, slash pine (*Pinus elliotti*) is also present, especially near wetland areas. Sand pines have short needles, usually shorter than 6 inches, whereas slash pine needles are usually longer than 8 inches. From this spot, only slash pines are visible. As

you walk away from the wetland, keep your eyes open for the short-needled sand pines. Sand pines are short-lived trees rarely reaching 80 years of age. It was estimated that the sand pines on the site were approximately 60-70 years old before the restoration. As sand pines mature they tend to lean but slash pines remain more erect. Sand pine cones are called serotinous, meaning the cones usually remain closed for many years and only open after fire or the death of the tree. The serotinous cones are a survival method, by saving seeds until such time that the competing vegetation is burned away.



#### 14. To Burn or not to Burn?

Fire is a common, natural force in most plant communities in Florida including scrub habitat and many types of wetlands. Scrub habitat burns approximately every 15-80 years. Fires that happen frequently will result in a type of scrub, often without sand pines. If fire occurs less frequently another type of scrub develops with mature sand pines. Under natural conditions fire would burn through sand pines, killing the sand pines. At this point the cones would release their seeds to start the cycle over. Without fire, these communities will develop into an unnatural condition with a loss of animal and plant diversity.

Prior to restoration efforts, large sand pines dominated this area. Because of the surrounding development, the likelihood of a fire occurring was remote and unsafe. Since a fire would have been extremely dangerous with the sand pines

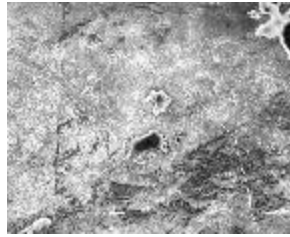


in place, the first step was to harvest the sand pines reducing the amount of fuel. To simulate fire, four primary methodologies were used to restore the site; controlled burning, root raking, roller chopping and harvesting.

## 15. Tough Love

It was seen after some wildfires in the area that several species of oaks grew rapidly and within a short period of time, eliminating the suitable scrub jay habitat created by the fire. Root raking was used to reduce the growth of the oaks. In this methodology both roots and plants were removed from some small areas to create some sandy open spaces which would remain that way for an extended time. A tractor with a large rake removed the roots and branches to a separate area where they were burned. At first the technique seemed too severe, however, these areas now have the highest diversity of plants.

## 16. Moonshine



An aerial from 1943 shows that the trail you are on extended from Enterprise to DeLand. This area, before Deltona was developed, was known as an excellent deer hunting area. During the restoration, several

1950's era cars were found as well as a rusted moonshine still.

## 17. Palms but no Coconuts

The saw palmetto (*Serenoa repens*) and the endemic



*Serenoa repens*

scrub palmetto (*Sabal etonia*) are two similar appearing species here in the scrub and are both in the palm family. Although at first glance they look the same, further inspection will reveal several differences. For example, the scrub palmetto has many

long "hairs" extending from the V-shaped leaves. The hairs of the scrub palmetto are used by the scrub jay as nest lining. Also, the saw palmetto, as the name implies, has curved spines on the edge of the leaf stalk, whereas the scrub palmetto's leaf stalk is smooth and actually extends into the leaves.



*Sabal etonia*

# Blueberry Trail

## 18. Log and Load

When the sand pines were harvested they were brought to these areas for processing. Here the trees were pruned, chipped and removed from the site. They were brought to a central location to limit the amount of heavy truck traffic in the preserve and to concentrate the pine cones in one area, thus, limiting the areas where sand pines would regenerate. The large amount of plant debris and sand pine seedlings is characteristic of the logging ramp areas.

## 19. That Sinking Feeling

Most of the lakes found in central Florida are formed by sinkholes that have filled with water. Sinkholes are common in this area because Florida lies on top of a large limestone rock deposit. Sinkholes form when rainfall slowly dissolves the limestone, creating a cavern, which eventually collapses.



The depression at this station is a prime example of a sinkhole. In wet times, it may be filled with water and appear like a pond.

## 20. Yes Deer, No Deer

Because the restoration area is a relatively small fragment of land, it does not support any large mammals such as black bear or white-tailed deer. Historically, before Deltona was developed, the area supported a large white-tailed deer population, which attracted hunters from all over the south.

Some of the mammals currently found in Lyonia Preserve include the protected Florida mouse (*Podomys floridanus*), gray squirrel (*Sciurus carolinensis*), cottontail rabbit (*Sylvilagus floridanus*), and both gray



*Urocyon  
cinereoargenteus*

(*Urocyon cinereoargenteus*) and red (*Vulpes fulva*) fox. Although they have not been directly observed, Virginia opossum (*Didelphis virginiana*) and armadillo (*Dasypus novemcinctus*) are likely to occur. Florida mice did not occur naturally on the site before the restoration, but have been introduced to try to increase its population.

## 21. Deadly Pets

If you look left from this section of trail, along the backside of the property there is a 100 ft. wide buffer. This buffer will hopefully serve as a barrier to human impacts, such as trespassing, debris, and the release of domesticated animals.

Animals that were once domesticated, but now live in the wild are called feral. The most common ones in Florida include feral pigs and cats. No pigs have been observed, but feral cats do live here. They can cause major disruptions in the natural community. For example, the animal most threatened by feral cats on this site is the endangered Florida scrub jay. It nests and lives close to the ground, so it is easy prey for cats.

## 22. Florida Foothills

Because this area was once a beach, the topography, or change in elevation, is quite dramatic. Most of Florida is relatively flat, so the “hilliness” often comes as a welcome relief to those accustomed to miles and miles of flat land.

Along this trail, at its highest point, you will be at an elevation approximately 50 feet above sea level. The highest point in Lyonia Preserve is approximately 75 feet above sea level, and the lowest point is 25 feet above sea level.

## 23. Birds of a Feather

At the time this brochure was printed, 73 different species of birds had been observed within Lyonia Preserve. The most obvious and cherished bird of the site is the Florida scrub jay (*Aphelocoma coerulescens*). Many

may be seen during the fall migration, when birds from the north fly through Florida on the way to their winter homes farther south.

The total number of birds and the number of species of birds has dramatically increased since the restoration project began. The newest additions to the site were hawks and scrub jays, which both require open spaces. Other bird species commonly



*Egretta thula*

seen on the property include rufous-sided towhee (*Pipilo erythrophthalmus*), red-bellied woodpecker (*Melanerpes carolinus*), red headed woodpecker (*Melanerpes erythrocephalus*), great horned owl (*Bubo virginianus*), barred owl (*Strix varia*), and cedar waxwing (*Bombycilla cedrorum*). If you venture towards one of the wetlands, you may also see herons, sandhill cranes (*Grus canadensis*), and wood ducks (*Aix sponsa*).

## 24. Killer Plant

Rosemary (*Ceratiola ericoides*) is one of the species of plants that is found only in the scrub community. This plant is



*Ceratiola ericoides*

well adapted to the harsh living conditions found in the scrub. It has two sets of roots, one that penetrates deep into the soil, to reach the groundwater, and one set that sprawls out in every direction just under the surface. This second set of roots is used to soak up as much rainfall as possible before it drains into the soil. It is believed that the surface layer of roots produce a poison that kills other roots growing near them. This production of a herbicide by a plant is called allelopathy.

It is interesting to see that rosemary only germinated in

root raked areas on bare soil, because, up until now, it was believed that this species could only germinate if the area had been burned by fire.

This is not the cooking herb commonly seen in grocery stores. Please do not harvest the leaves for tonight's spaghetti dinner!

## 25. Oakey Dokey

Oaks are the most common plants in scrub. In fact, there are four species of oaks found throughout the preserve including myrtle oak (*Quercus myrtifolia*), sand live oak (*Quercus geminata*), Chapman's oak (*Quercus chapmanii*) and turkey oak (*Quercus laevis*).



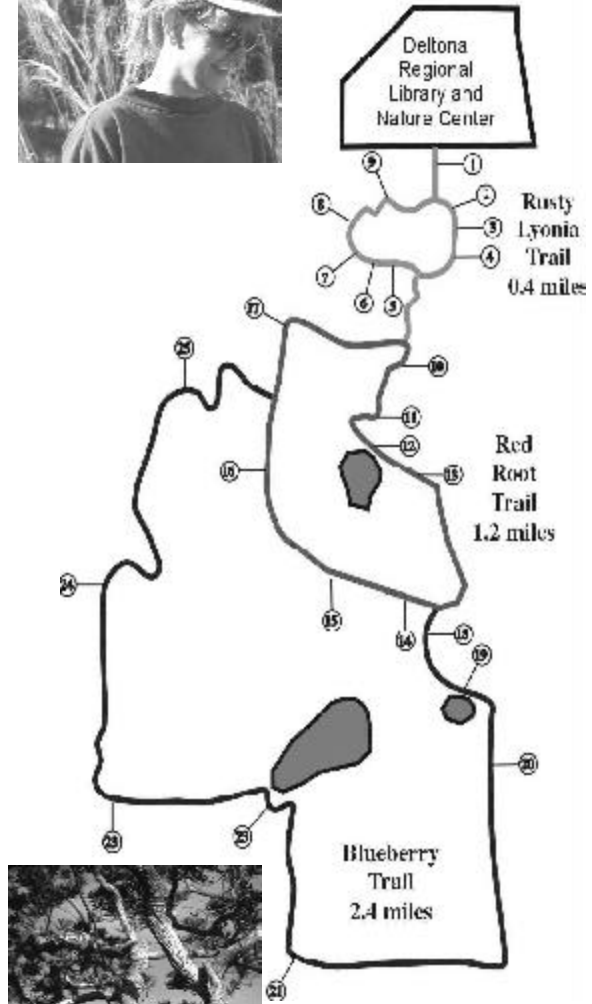
The most common oak, myrtle oak, has small spatula shaped leaves. This oak is usually found in shrub form, but will reach small tree size without fire.

Sand live oak, with its longer thin leaves, will reach tree size in the absence of fire as seen near the wetlands. Turkey oak, the least common species, is not usually found in scrub. The deciduous turkey oak is so named because the leaf looks like the shape of a turkey's foot.

In the fall the oak acorns are a valuable food source for the scrub jays. They will gather the acorns throughout the summer, bury them and later retrieve them in the winter.

## Final Thoughts

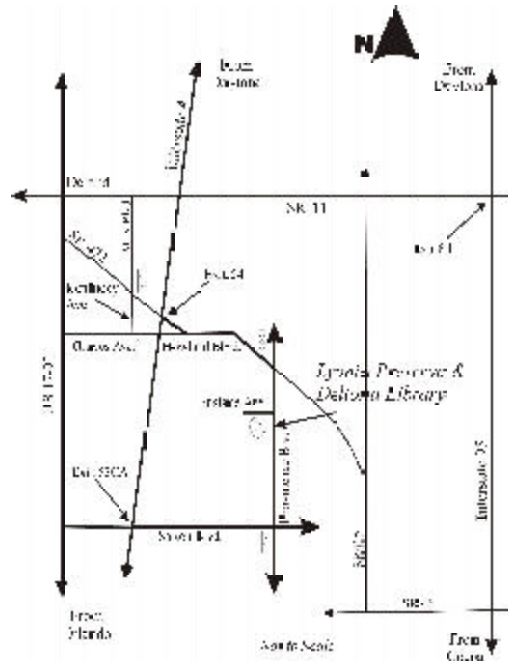
Had Lyonia Preserve not been designed, and trails put in place, you would have had a much shadier, although boring walk. There were far fewer species of plants and animals and very little change in general appearance throughout the site. Human impacts created unnatural areas by eliminating fire. Volusia County has attempted to overcome these human impacts by trying to make human impacts that simulate nature. We hope you have enjoyed your visit, and will encourage others to visit Lyonia Preserve.



*Lyonia ferruginea*

# Lyonia Preserve

Behind the Deltona Library  
1250 Eustace Avenue  
Deltona, Florida



Guided tours and educational programs available.  
If you have any comments or questions please contact:

Volusia County  
Land Acquisition and Management  
123 W. Indiana Ave.  
DeLand, Fl. 32720-4621  
(904) 736-5927

Or visit our the Lyonia Preserve desk in the library.

<http://volusia.org/environmental>  
[enet@co.volusia.fl.us](mailto:enet@co.volusia.fl.us)

