

# Sand Pine Scrub

Intermediate contestants should study the following description to prepare for the Ecosystem Quiz station in the [Florida 4-H Annual Forest Ecology Contest](#)



Sand pine scrub. Source: Rebekah D. Wallace, University of Georgia, [Bugwood.org](#)

## Contents

|                       |   |
|-----------------------|---|
| General Description   | 2 |
| Environmental Factors | 2 |
| Flora and Fauna       | 3 |

## General Description

Endangered species are plants or animals that are in danger of extinction because of a serious decline in their population or essential habitat. Ecosystems can also be endangered, and Florida's scrub ecosystems are an example of that.

Scrub ecosystems are found on deep, sandy soils where the water table is extremely low. Water drains very easily through this sandy soil and nutrients are drained away with it. This leaves the scrub plants with little nutrients for plant growth. Animals like beetles, mice, pocket gophers, and gopher tortoises are constantly digging through the soil, so no clear layers ever form. Despite the harshness of these areas, scrub ecosystems are home to many endemic species, which are species that can only be found in those areas.

There are different types of scrub ecosystems, each based on the most common plants found there. Sand pine scrub ecosystems are scrub ecosystems with sand pine being the only trees growing into the canopy. The pine canopy can range from just a few pines with their branches spread out to many thin trees packed together. The groundcover is patchy and dominated by dense, short-growing, evergreen shrubs.

Sand pine scrub is found along what was once an ancient shoreline and represents one of Florida's oldest ecosystems. Today, those areas are found along central Florida. There are two major areas of sand pine scrub—along the northern part of the Lake Wales Ridge and in the Ocala National Forest.

## Environmental Factors

Environmental factors like fire and wind play a major role in maintaining sand pine scrub ecosystems. Sand pine scrub ecosystems need high intensity fires to regenerate. Without fire, other plants will take over and make the ecosystem unsuitable to many of its endemic species. In the Panhandle, wind also contributes to regenerating the sand pine scrub.

Like many of Florida's ecosystems, sand pine scrub is adapted to fire. Unlike the frequent fires in sandhill ecosystems (every 1-5 years), fires in sand pine scrub only happen every 5 to 40 years. This is because the groundcover in sand pine scrub is patchy which makes fires difficult to start. When fires do occur in sand pine scrub, they are called stand-replacing fires because they burn everything in the area. Life quickly comes back to sand pine scrub after fire; many of the shrubs sprout up from their underground roots that were protected from the fire. Even though the adult sand pines have been killed by fire, the fire allowed the sand pine to spread its seeds. Sand pine is a serotinous plant, meaning that their cones are covered by a layer of resin and will only open when the heat of a fire melts that resin to open the cone. In addition, fire recycles the nutrients into the soil and makes them available for the plants that come back after the fire.

Sand pine is susceptible to disease as it gets older. Without fire, the sand pine will die out before they can reproduce, and the shrubby oaks will grow into the overstory. These oaks will close up the canopy and make it difficult for those areas to burn again. The animals that depend on the open understory will be forced to find another place to live.

Wind also plays an important role in sand pine scrub ecosystems. Strong wind events like hurricanes often make landfall in the Panhandle of Florida and can blow down trees. When those trees fall over, this opens up the forest floor for new plants to take their place. Sand pine can also take advantage of these openings. The sand pine in the Panhandle are not serotinous and do not need fire to reproduce. Instead, their seeds can be spread through the wind or animals that eat them.

## Flora and Fauna

### Plants

The plants that grow in scrub ecosystems have adapted to the nutrient-poor and xeric, or dry, conditions. The water table is too low for most plants to reach. As a result, most plants have many fine roots near the surface to capture water and nutrients as soon as it becomes available. Scrub plants generally also have thick leaves with bristles or hairs on them to conserve water.

There are a wide variety of plants that call sand pine scrub ecosystems their home. Sand pines are the only trees found in the overstory. These trees provide important cover and nesting habitat for songbirds and woodpeckers. Three evergreen shrubs dominate the understory in sand pine scrub—Chapman oak, myrtle oak, and sand live oak. The acorns these shrubs produce are an important food source for many animals that live in scrub ecosystems. Other common plants found in the understory include Florida rosemary, saw palmetto, and three-awn.



Needles and closed cones of sand pine (*Pinus clausa*).  
Source: Niels Proctor, UF/IFAS

Many plants in sand pine scrub ecosystems are endemic and/or endangered, including the Florida blazing star, Florida goldenaster, four-petal pawpaw, and the pygmy fringetree. Sand pine scrub ecosystems provide an important refuge for these protected species.



Leaves of Chapman oak (*Quercus chapmanii*). Source: Rebekah D. Wallace, University of Georgia, [Bugwood.org](http://Bugwood.org)



Leaves of myrtle oak (*Quercus myrtifolia*). Source: Rebekah D. Wallace, University of Georgia, [Bugwood.org](http://Bugwood.org)



Leaves of sand live oak (*Quercus geminata*). Source: Rebekah D. Wallace, University of Georgia, [Bugwood.org](http://Bugwood.org)

## Animals

Many species of animals depend on the open areas of habitat provided by scrub. One such species is the endangered Florida scrub-jay. The Florida scrub-jay is the only bird that is endemic to Florida. It feeds on the acorns of the shrubby oaks and takes advantage of the open canopy to look out for predators. The Florida-scrub jay will leave the area if the shrubs become too tall.

Many other animals also use scrub ecosystems. Animals like black bears, white-tailed deer, skunks, bobcats, and squirrels will feed on the many nuts, seeds, and fruits available as they travel through the area. Many birds, including eastern towhees, common nighthawks, and brown thrashers, nest in scrub habitat. The gopher tortoise also prefers the sandy soil as it is easy for them to dig their burrows. In turn, these burrows provide an important refuge for other species during a fire.

Scrub ecosystems are home to many endemic wildlife that make use of the sandy soil and open groundcover. Among them are the Florida scrub lizard, sand skink, and Florida mouse. In addition, over 50 spiders and insects are found only in scrub ecosystems in Florida. Protecting these ecosystems is essential to preserve these rare Florida native species.



Florida scrub-jay (*Aphelocoma coerulescens*).  
Source: Ken Gioeli, UF IFAS Extension



A gopher tortoise (*Gopherus polyphemus*) leaving its burrow. Source: Carrie Stevenson, UF IFAS Extension

## Human Impact

Scrub ecosystems are declining rapidly in Florida. Only 10-15% of Florida scrub remains intact. The largest threat to scrub ecosystems is habitat loss due to development. Since the soil is elevated and dry, it is unlikely that it will ever flood. This makes scrub ecosystems a desirable place to build farms and homes. In central Florida especially, thousands of acres of scrub habitat have been converted into citrus farms and houses.

When people build houses next to scrub ecosystems, fire suppression becomes an issue. The high intensity fires that scrub ecosystems need to regenerate can threaten nearby homes and other man-made structures. As such, fires in these areas are prevented or put out. Without fire, the shrubby oaks will grow into the overstory and the animals that depend on the open spaces will have to leave. Fire suppression also poses a risk to the

homes next to the forest. The longer an area goes without fire, more fuel like dead branches and leaves will build up. So when a fire does start in an area, it will be very destructive and difficult to control.

Many people have banded together to protect scrub ecosystems. Much of the remaining habitat is protected by different groups such as the USDA Forest Service, Florida State Parks, and The Nature Conservancy. These groups help protect scrub habitat by encouraging fire and conducting research on how to best manage this ecosystem.

**Places to see examples of sand pine scrub:**

- Ocala National Forest
- Merritt Island National Wildlife Refuge
- Lake June-in-Winter State Park
- Oscar Scherer State Park

**Links to learn more:**

- Florida Natural Areas Inventory:  
[https://www.fnai.org/PDFs/NC/Scrub\\_Final\\_2010.pdf](https://www.fnai.org/PDFs/NC/Scrub_Final_2010.pdf)
- Florida Native Plant Society:  
<https://www.fnps.org/natives/native-plant-community/scrub>
- US Fish and Wildlife Service:  
<https://www.fws.gov/verobeach/msrppdfs/flscrub.pdf>