

Sand Pine Scrub

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



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General Description

While there are several sub-types of scrub land, all are located in upland areas where the water table is low and all are maintained by fire. The habitat generally consists of open pinelands with an understory of various oaks, shrubs, and palmetto. The sandy soil is unable to hold water so rainfall and nutrients leach down through the sand, leaving a dry, nutrient-poor substrate. There is little or no silt, clay, or organic matter in the soil which is often called "sugar sand" because of its fine texture and light color. No clear layers of soil form in scrub lands, partly because animals such as beetles, mice, pocket gophers, and gopher tortoises are constantly burrowing through the sand and mixing it up.

The plants in scrub ecosystems have adapted to the dry, harsh conditions, and are called xerophytic (dryness-loving). Many have developed means of trapping and retaining water when it is available. Most have shallow root systems with fine roots near the surface to get what nutrients are present and deeper, sinker roots to bring in water. The leaves on scrub plants are generally small and have a tough texture and tiny bristles or hairs on them to help retain moisture. Many of the trees and shrubs have a twisted or gnarled look as a result of the harsh environment.

One of the best known sub-types of scrub is sand pine scrub which consists of an overstory of pine trees with sandy, often bare areas of ground underneath. These open patches are interspersed with clumps or clusters of plants. While there is little or no ground cover in scrub lands, there may be mats of lichen among dense thickets of woody shrubs such as rosemary or *Lyonia*.

Environmental Factors effecting Scrub

The role of fire in scrub habitats

The natural plant community in scrub lands needs occasional, high-intensity fires in order to thrive and regenerate. In the absence of fire, many scrub plants will slowly be replaced by other species that are not adapted to periodic fire.

Sand pine scrub is known as a pyrogenic, or fire-dependant ecosystem. It requires infrequent, high-intensity fires to maintain the structure and composition of the natural plant community. If fire is suppressed for long periods of time in sand pine scrub the pines are unable to regenerate and various oaks may establish and form an oak-rosemary scrub community. Long-term exclusion of fire will eventually result in an oak scrub land or an upland hardwood hammock.

Lightning fires that occur every 20 to 60 years burn all, or most of the surface vegetation in scrub lands and allow the trees and ground plants to regenerate and repeat their cycles. If fire occurs too frequently the pines don't have enough time to mature and are incapable of reseeding after the fire. If fire occurs after too long a time vegetation will build up and create too much fuel. This may result in a very hot fire difficult to control. Since most fires stimulate regeneration of trees in an area, the new trees in the forest are all about the same age. For this reason sand pine forests are generally described as even-aged forests.

Many of the species that grow in sand pine scrub require the heat of a fire to release their seeds or to stimulate flowering. Sand pines are a serotinous species. The cones remain on the tree and sealed shut with resin until the heat of a hot fire melts the resin and allows the cones to open and release the seeds and establish new seedlings. Wiregrass, an herbaceous groundcover around the edges of scrub ecosystems, needs fire in order to stimulate flowering and seeding.

Infrequent, devastating, high-intensity fires may destroy the tree canopy but they allow sunlight to bathe the forest floor and aid in the regrowth of new plants. These hot fires leave behind a nutrient-rich ash that feeds the new plants as they re-sprout. Since most surface vegetation is burned away, little or no competition for nutrients exists so young pine seedlings are able to establish easily and grow quickly. Scrub habitat regenerates rapidly after most fires.

Other environmental factors in scrub ecosystems

While fire plays a major role in the maintenance of scrub ecosystems there are a number of other environmental factors that also help shape these unique habitats. The harsh, open terrain offers little protection from high winds. Wind blow-downs, when large branches or entire trees may be removed, leave open patches in the landscape. These provide opportunities for sun-loving plants to colonize the openings. Pits or brush piles from tree-falls also alter the landscape of scrub lands and may provide additional habitat for wildlife. As mentioned earlier, the burrowing and mounding activities of some wildlife affect both the soil and the terrain of scrubs. Another environmental factor related to scrub habitat is the fine-textured sandy soil. Since it is unable to hold moisture, rainfall seeps through the porous soil and into the water table far below. This helps to recharge the underground aquifer that provides water for much of Florida.

Flora and Fauna of Scrub Ecosystems

Plants

While scrub lands have more endemic plants than any other ecosystem type, they have a fewer number of plant species overall. Ninety percent of the plants in scrub lands belong to a few primary, core species. Sand pine is the most common tree species in scrub ecosystems, although longleaf pine may also occur there. Three evergreen oaks are also common to scrub lands. They are chapman's

oak, myrtle oak, and sand live oak. Common shrubs include rosemary, rusty lyonia, and saw palmetto, while groundcover generally consists of lichen mats and a variety of herbaceous plants.

Among the array of plants found in scrub habitats are over 25 species that are listed as rare, threatened, or endangered. These include scrub lupine, scrub blazing star, Florida gayfeather, and pygmy fringe tree. The largest number of rare species are found in the Lake Wales Ridge area which represents one of the oldest habitats in Florida.

Wildlife

Many wildlife live within the low scrubby layer of vegetation. One of these is the famous Florida scrub jay, an endangered species that can only survive in scrub habitat. The jays feed on the scrub oak acorns and help to disperse the seeds. Scrub jays are even known to bury some of the acorns to store them for later use. These unusual birds adapt easily to humans and may seem almost tame at times. As the under story habitat starts to grow out and become more dense, scrub jays will relocate to another, more open area.

Other wildlife that use the low scrubby habitat include the scrub mouse, scrub lizard, and sand skink. Birds such as quail, ground doves, common nighthawks, and loggerhead shrikes are frequent residents of low scrubs.

Some wildlife prefer to use the higher level, sand pine canopy. Flycatchers, woodpeckers, warblers, wrens, cooper's hawks, and screech owls may all be seen within sand pine scrub. Flying



Photo Peter May

squirrels and grey squirrels are other common residents in the tree canopy.

Scrub lands are home to a variety of other animals. Mammals that use these habitats and feed on the many fruits, seeds, and nuts include black bear, white-tailed deer, raccoon, wild hog, grey fox, bobcat, and spotted skunk. Gopher tortoises, considered a vulnerable species in Florida, are often seen burrowing within the groundcover, while golden mice and cotton mice hide in the scrubby grasses. Numerous spiders and insects live in scrub ecosystems too.

Within the Florida scrub there are more than 20 species of animals that are listed as rare, threatened, or endangered, including the indigo snake, sand skink, and mole skink. Additionally, many scrub species are considered endemic to these unique habitats. They cannot survive anywhere else. These rare animals include the Florida scrub jay, scrub lizard, blue-tailed mole skink, sand skink, and Florida mouse. If scrub lands disappear these animals will most likely disappear as well.

Human Impact on Scrub Ecosystems

Scrub land in Florida is high and dry so it is often selected for agricultural, residential, or industrial development. Thousands of acres of original scrub have been converted to citrus orchards, golf courses, and homes. Increasing populations in Florida have resulted in significant decreases in scrub habitat.

Since most people don't want fire near their homes or businesses, natural fires are usually suppressed in these areas. In this absence of fire, the remaining scrub habitat is left to grow out and eventually disappear. Scrub lands are the most rapidly-declining ecosystem type in Florida.

Suppression of fire also increases the risks to residents in the area. As vegetation builds up it becomes fuel that will burn quickly and easily once ignited. This results in hotter, more serious fires that may destroy homes and agricultural crops. While prescribed burns

are often used to reduce the amount of vegetative fuel and lower the risks to humans and animals, many residents are bothered by the smoke and ash from these fires.

Development of scrub habitat may also be harmful to the environment. Since scrub lands allow water to leach down quickly through the soil, pollutants such as agricultural waste or urban runoff may contaminate the water table below and threaten the purity of our ground water supply.

Summary

Sand pine scrub ecosystems are a valuable natural resource. They provide timber for pulp and paper-making, act as natural recharge areas for the Florida aquifer, and are home to many rare, threatened, or endangered plants and animals. Because they are not susceptible to flooding, these areas are often converted to citrus orchards, golf courses, and housing developments. Rapid development of scrub lands has made them the most endangered ecosystem type in Florida. These precious wildlands need to be protected and carefully managed in order to guarantee their existence for generations to come.

Scrub habitat may be found on elevated dunes along the Florida coastline or inland along the central, sandy ridges of the peninsula. You can visit scrub forests at Ocala National Forest, Jonathan Dickinson State Park, Merritt Island National Wildlife Refuge, Silver River State Park, St. Joseph Peninsula State Park and Oscar Scherer State Recreation Area.

