13870

Florida Peninsula Inland Scrub

BpS Model/Description Version: Aug. 2020

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| --- | --- | --- | --- |
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| None | None | None | None |

Vegetation Type

Shrubland

Map Zones

55, 56

Geographic Range

This system is endemic to peninsular Florida, with the largest concentration on the central ridge. It occupies a large portion of the Ocala National Forest (where it is referred to as the Big Scrub of Ocala) and was once prevalent on the Lake Wales Ridge. Historically smaller patches of scrub were found on old dunes stretching from St. John's County south to the northern portion of Dade County on the east coast, and from near Cedar Key south to Naples on the west coast.

Biophysical Site Description

Florida scrub is a xerophytic, evergreen plant community found on excessively well-drained, nutrient poor entisols (deep droughty infertile sands of marine and aeolian origin) of the quartzipsamment classification. Elevation ranges from 20-200ft. The area has hot, humid summers, somewhat dry winters, a long growing season, and abundant precipitation (53-60in/yr). However, because of the low moisture-holding capacity of the soils, drought conditions can exist within two weeks of a heavy rainfall. It is possible that heavy fog can ameliorate water stress. Surface temperatures of exposed soils can be extreme.

This system is restricted to a sequence of north/south-trending sand ridges, ancient dune fields, and former shorelines in the Florida peninsula. The largest inland scrub is found in two primary areas, essentially isolated from one another. The so-called Big Scrub of the Ocala National Forest is the largest expanse of this system, with a somewhat smaller, more southerly area associated with the Lake Wales Ridge (NatureServe 2006).

Vegetation Description

Ocala sand pine (*Pinus clausa* var. *clausa*) forests have an overstory of predominantly even-aged sand pine with twisted and leaning trunks growing over an understory of evergreen shrubs. Typical understory species include myrtle oak (*Quercus myrtifolia*), sand live oak (*Q. geminata*), Chapman's oak (*Q. chapmanii*), turkey oak (*Q. laevis*), rusty lyonia (*Lyonia ferruginea*), rosemary (*Ceratiola ericoides*), scrub palmetto (*Sabal etonia*) and saw palmetto (*Serenoa repens*). Herbs and grasses are very sparse in mature scrub habitats, but lichens (*Cladonia* spp.) can form extensive patches on the forest floor. Other ground cover species may include *Rhynchospora megalocarpa* and *Andropogon floridanus* (NatureServe 2006). Lake Wales scrub is very similar except that it often has few or no emergent sand pine.

A general map of sand pine scrub depicts three groupings in Florida: inland peninsula, coastal peninsula, and coastal panhandle scrub (Myers 1990). Sand pine scrub discussed here refers to the variety found in peninsular Florida.

BpS Dominant and Indicator Species

|  |  |  |
| --- | --- | --- |
| **Symbol** | **Scientific Name** | **Common Name** |
| PICL | *Pinus clausa* | Sand pine |
| QUMY | *Quercus myrtifolia* | Myrtle oak |
| QUCH | *Quercus chapmanii* | Chapman oak |
| QULA2 | *Quercus laevis* | Turkey oak |
| QUGE2 | *Quercus geminata* | Sand live oak |
| SAET | *Sabal etonia* | Scrub palmetto |
| CEER3 | *Ceratiola ericoides* | Sand heath |
| SERE2 | *Serenoa repens* | Saw palmetto |

Species names are from the NRCS PLANTS database. Check species codes at http://plants.usda.gov.

Disturbance Description

The scrub is typified by fire regimes II and IV, with primarily stand-replacement fires from 10-45yrs, but some fires occur at shorter or longer intervals. Because of its sparse ground cover and compacted litter layer, most of the time Ocala sand pine scrub will not burn. High winds and extreme conditions approximately every10-100yrs, usually during the spring drought, result in a high-intensity passive crown fire that burns the understory, kills the sand pine overstory. and opens the serotinous cones contained in its crowns (although all cones may not be serotinous). Fire in areas with little or no sand pine overstory are supported by the same midstory and understory evergreen oaks and shrubs that provide fuel for crown fires in scrub with sand pine. Prolonged fire suppression of sand pine scrub may result in xeric hammock formation (class D).

Alternative disturbances - Sand pine trees older than 50yrs can experience significant mortality due to root disease/rot. This will result in closed stands of class E converting to open stands of class D. In addition, wind disturbances in the form of hurricanes comprise another non-fire disturbance that can significantly affect succession in this system.

Mixed fire is also possible in seedling stands in class A and in closed stands of class E where it kills some of the sand pine creating open conditions. If seedling stands are thinned by fire in A they proceed along an alternate succession pathway to C.

Fire Frequency

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Severity** | **Avg FI** | **Percent of All Fires** | **Min FI** | **Max FI** |
| Replacement | 33 | 97 | 10 | 100 |
| Moderate (Mixed) | 1265 | 3 | 60 | 1000 |
| Low (Surface) |  |  |  |  |
| All Fires | 32 | 100 |  |  |

Fire interval is expressed in years for each fire severity class and for all types of fire combined (All Fires). Average FI is the central tendency modeled. Percent of all fires is the percent of all fires modeled in that severity class. Minimum and Maximum FIs show the relative range of fire intervals as estimated by model contributors, if known.

Scale Description

Scrub-like vegetation is thought to have been widespread in the peninsula of FL in the late Pleistocene (44,000-10,000yrs before current era). The inland scrub systems of today likely persisted on fossil dunes since the early Pleistocene (Myers 1990). The largest contiguous area of this scrub type that remains is estimated at 250,000ac.

Adjacency or Identification Concerns

Sand pine scrub is commonly found adjacent to high pine (open pinelands) areas consisting of a *Pinus palustris* overstory.

NatureServe (2006) notes Florida Longleaf Pine Sandhill (CES203.284) as an adjacent ecological system.

Note: This model applies to inland scrub and not to coastal scrub systems in Florida because succession in coastal scrub is driven more by wind events than by fire.

Issues or Problems

One assumption in the model is that older open stands do not typically have sufficient seed from few open cones to produce enough seedlings for stands to become closed in with a canopy cover of sand pine >40%. Once trees become older than 50yrs, significant mortality due to root disease is common. This will result in closed stands of class E converting to open stands of class D.

Historical fire size reported here is an estimation based on big scrub area of Ocala National Forest. Fires on average would be smaller on Lake Wales ridge.

Native Uncharacteristic Conditions

Comments

The original FRCC code, SPSC, was modeled by Kenneth Outcalt. Lisa McInnis modified the model and description to produce R9SPSC for the Rapid Assessment. Outcalt utilized R9SPSC to generate the description for this Biophysical Setting (BpS). The VDDT model was also revised by Outcalt in response to earlier reviewers comments that it did not reflect conditions outside the Big Scrub area (Tallahassee model review 09/19/2006). To account for the low level or complete lack of sand pine in some scrubs an alternate succession pathway was added to A that allows some sites to progress to open conditions in C. The model outputs more closely reflect the overall distribution between classes, but local interpretation is necessary. Historically, areas in Big Scrub likely had greater amounts in closed B while those on fringes and on Lake Wales ridge had more open areas in C.

Succession Classes

**Mapping Rules**

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Upper Layer Lifeform** | **Height (m)** | **Canopy Cover (%)** | | | | | | | | | |
| **0-10** | **11-20** | **21-30** | **31-40** | **41 - 50** | **51-60** | **61-70** | **71-80** | **81-90** | **91-100** |
| Herb | 0-0.5 | A | A | A | A | A | A | A | A | A | A |
| Herb | 0.5-1.0 | A | A | A | A | A | A | A | A | A | A |
| Herb | >1.0 | A | A | A | A | A | A | A | A | A | A |
| Shrub | 0-0.5 | A | A | A | A | A | A | A | A | A | A |
| Shrub | 0.5-1.0 | A | A | A | A | A | A | A | A | A | A |
| Shrub | 1.0-3.0 | A | A | A | A | A | A | A | A | A | A |
| Shrub | >3.0 | A | A | A | A | A | A | A | A | A | A |
| Tree | 0-5 | C | C | C | C | B | B | B | B | B | B |
| Tree | 5-10 | C | C | C | C | B | B | B | B | B | B |
| Tree | 10-25 | D | D | D | D | E | E | E | E | E | E |
| Tree | 25-50 | D | D | D | D | E | E | E | E | E | E |
| Tree | >50 | D | D | D | D | E | E | E | E | E | E |

Succession class letters A-E are described in the Succession Class Description section. Some classes use a leafform distinction where a qualifier is added to the class letter: Brdl (broadleaf), Con (conifer), or Mix (mixed conifer and broadleaf). UN refers to uncharacteristic native or a combination of height and cover that would not be expected under the reference condition. NP refers to not possible or a combination of height and cover which is not physiologically possible for the species in the BpS.

**Description**

Class A 15 Early Development 1 - All Structures

Indicator Species

|  |  |  |  |
| --- | --- | --- | --- |
| **Symbol** | **Scientific Name** | **Common Name** | **Canopy Position** |
| QUMY | Quercus myrtifolia | Myrtle oak | Low-Mid |
| QUGE2 | Quercus geminata | Sand live oak | Low-Mid |
| SAET | Sabal etonia | Scrub palmetto | Low-Mid |
| PICL | Pinus clausa | Sand pine | Lower |

Description

Post fire, the system is shrub-dominated due to prolific sprouting of shrubby oaks. Oaks may return to pre-fire cover within 2yrs of fire. Seedlings of sand pine are numerous is stands that previously contained sand pine but will be sparse or absent from stands that had few or no sand pine prior to disturbance.

Upper Layer Lifeform is not the dominant lifeform. Canopy can be dominated by *Pinus clausa* minimum cover of 2%; maximum cover of 60% but is often dominated by scrub oaks with minimum cover of 30% to maximum of 60%.

*Maximum Tree Size Class*  
Sapling >4.5ft; <5"DBH

Class B 52 Mid Development 1 - Closed

Indicator Species

|  |  |  |  |
| --- | --- | --- | --- |
| **Symbol** | **Scientific Name** | **Common Name** | **Canopy Position** |
| PICL | Pinus clausa | Sand pine | Mid-Upper |
| QUMY | Quercus myrtifolia | Myrtle oak | Middle |
| QUGE2 | Quercus geminata | Sand live oak | Middle |
| SAET | Sabal etonia | Scrub palmetto | Low-Mid |

Description

This class contains sapling to pole-sized sand pine with >40% canopy cover. There is significant oak cover in the midstory.

*Maximum Tree Size Class*  
Pole 5-9" DBH

Class C 15 Mid Development 1 - Open

Indicator Species

|  |  |  |  |
| --- | --- | --- | --- |
| **Symbol** | **Scientific Name** | **Common Name** | **Canopy Position** |
| PICL | Pinus clausa | Sand pine | Mid-Upper |
| QUMY | Quercus myrtifolia | Myrtle oak | Middle |
| QUGE2 | Quercus geminata | Sand live oak | Middle |
| SAET | Sabal etonia | Scrub palmetto | Lower |

Description

This class may contain sapling to pole sized sand pine with <40% canopy cover. Much of the area is dominated by mid and understory oaks.

Upper Layer Lifeform is not the dominant lifeform. Sand pine may be a minor component or absent. Midstory oaks with cover of 40-60% are dominant with height of 5-9m.

*Maximum Tree Size Class*  
Pole 5-9" DBH

Class D 9 Late Development 1 - Open

Indicator Species

|  |  |  |  |
| --- | --- | --- | --- |
| **Symbol** | **Scientific Name** | **Common Name** | **Canopy Position** |
| PICL | Pinus clausa | Sand pine | Upper |
| QUMY | Quercus myrtifolia | Myrtle oak | Mid-Upper |
| QUGE2 | Quercus geminata | Sand live oak | Mid-Upper |
| SAET | Sabal etonia | Scrub palmetto | Lower |

Description

This class will have mature saw-timber sized sand pine if sand pine is present with <40% canopy cover. There may be scattered seedling to pole sized sand pine in openings created by mature sand pine mortality. Much of the area is dominated by midstory oaks.

Upper Layer Lifeform is not the dominant lifeform. Sand pine may be a minor component or absent. Midstory oaks with cover of 40-60% are dominant with height of 10-25m.

*Maximum Tree Size Class*  
Medium 9-21"DBH

Class E 9 Late Development 1 - Closed

Indicator Species

|  |  |  |  |
| --- | --- | --- | --- |
| **Symbol** | **Scientific Name** | **Common Name** | **Canopy Position** |
| PICL | Pinus clausa | Sand pine | Upper |
| QUMY | Quercus myrtifolia | Myrtle oak | Mid-Upper |
| QUCH | Quercus chapmanii | Chapman oak | Mid-Upper |
| QUGE2 | Quercus geminata | Sand live oak | Mid-Upper |

This class includes mature saw-timber sized sand pine with >40% canopy cover. There are scattered seedling to pole-sized sand pine in openings created by mature sand pine mortality. There are scattered larger oaks. Lichen species (*Cladonia* spp) are common in large patches.

*Maximum Tree Size Class*  
Medium 9-21"DBH

Model Parameters

Deterministic Transitions

|  |  |  |  |
| --- | --- | --- | --- |
| **From Class** | **Begins at (yr)** | **Succeeds to** | **After (years)** |
| Early1:ALL | 0 | Mid1:CLS | 5 |
| Mid1:OPN | 6 | Late1:OPN | 44 |
| Mid1:CLS | 6 | Late1:CLS | 44 |
| Late1:OPN | 45 | Late1:OPN | 999 |
| Late1:CLS | 45 | Late1:OPN | 999 |

Probabilistic Transitions

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Disturbance Type** | **Disturbance occurs In** | **Moves vegetation to** | **Disturbance Probability** | **Return Interval (yrs)** | **Reset Age to New Class Start Age After Disturbance?** | **Years Since Last Disturbance** |
| Alternative Succession | Early1:ALL | Mid1:OPN | 0.05 | 20 | Yes | 0 |
| Wind or Weather or Stress | Mid1:OPN | Early1:ALL | 0.005 | 200 | Yes | 0 |
| Replacement Fire | Mid1:OPN | Early1:ALL | 0.036 | 28 | Yes | 0 |
| Wind or Weather or Stress | Mid1:CLS | Early1:ALL | 0.005 | 200 | Yes | 0 |
| Replacement Fire | Mid1:CLS | Early1:ALL | 0.036 | 28 | Yes | 0 |
| Mixed Fire | Late1:OPN | Late1:OPN | 0.005 | 200 | No | 0 |
| Wind or Weather or Stress | Late1:OPN | Early1:ALL | 0.005 | 200 | Yes | 0 |
| Replacement Fire | Late1:OPN | Early1:ALL | 0.033 | 30 | Yes | 0 |
| Mixed Fire | Late1:CLS | Late1:OPN | 0.004 | 250 | Yes | 0 |
| Wind or Weather or Stress | Late1:CLS | Early1:ALL | 0.005 | 200 | Yes | 0 |
| Insects or Disease | Late1:CLS | Late1:OPN | 0.017 | 59 | Yes | 0 |
| Replacement Fire | Late1:CLS | Early1:ALL | 0.033 | 30 | Yes | 0 |

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