13600

South Florida Pine Rockland

BpS Model/Description Version: Aug. 2020

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| **Modelers** |  | **Reviewers** |  |
| Duane Weis | weisd@doacs.state.fl.us | Chris Bergh | cbergh@tnc.org |
| Hillary Cooley | Hillary\_Cooley@nps.gov | Rick Anderson | thomas\_r\_anderson @nps.gov |
| None | None | Hillary Cooley | hillary\_cooley@nps.gov |

Vegetation Type

Forest and Woodland

Map Zones

56

Geographic Range

Pine rocklands occur in extreme south FL and the lower Florida Keys.

NatureServe (2006) notes that Davis (1943) mapped this system, which occurred primarily on the Miami ridge bordering the Everglades, with disjunct examples found in the Big Cypress Swamp. McPherson's (1986) map of Big Cypress shows "pine forest," which includes both pine rocklands and pine flatwoods, scattered across the unit. It may be possible to differentiate based on soil type or geology. In the Florida Keys it is found on Big Pine Key, No Name Key, Little Pine Key, Cudjoe Key and Upper Sugarloaf Key.

Biophysical Site Description

Pine rocklands occur on alkaline limestone bedrock. Along the southeast coast of FL this system occurs on Miami Oolitic Limestone, while in the Big Cypress region (southwest FL) it is found on outcrops of Tamiami Limestone (NatureServe 2006).

Vegetation Description

Pinus elliottii var. densa is the only native pine species in this system (NatureServe 2006). It has been estimated that nearly one-third of the taxa found in this system are restricted to it, including half of south Florida’s endemic plants (Stout and Marion 1993). The overstory consists primarily of south Florida slash pine (Pinus elliotti var. densa) with crown closure ranging from 10-60%. A sometimes sparse, but often species-rich understory consists of shrubby tropical evergreen hardwoods, palms, forbs and graminoids.

Common shrubs or subcanopy species include live oak (Quercus virginiana), wild tamarind (Lysiloma latisiliquum), poisonwood (Metopium toxiferum), indigo berry (Randia aculeata), varnish leaf (Dodonea viscosa), myrsine (Myrsine cubana, synonyms -- Rapanea punctata or Myrsine floridana), rough velvet seed (Guettarda scabra) coco-plum (Chrysobalanus icaco), willow bustic (Bumelia salicifolia) and marlberry (Ardisia escallonoides).

Common palms, in both the Florida Keys and mainland FL, include saw palmetto (Serenoa repens) and cabbage palm (Sabal palmetto). Additionally, in the Florida Keys, thatch palm (Thrinax morrisii, T. radiata) and silver palm (Coccothrinax argentata) are abundant and create denser palm cover.

Typical graminoid species include splitbeard bluestem (Andropogon ternarius var. cabanisii, synonym -- Andropogon cabanisii), little bluestem (Schizachyrium rhizomatum) and white-top (Rhynchospora colorata, synonym -- Dichromena colorata).

Forbs frequently found include showy milkwort (Polygala grandiflora), pineland heliotrope (Heliotropium polyphyllum), redgal (Morinda royoc), silver dwarf morning glory (Evolvulus sericeus) and rabbitbells (Crotalaria rotundifolia).

BpS Dominant and Indicator Species

|  |  |  |
| --- | --- | --- |
| **Symbol** | **Scientific Name** | **Common Name** |
| PIELD | *Pinus elliottii var. densa* | Florida slash pine |
| SERE2 | *Serenoa repens* | Saw palmetto |
| THRIN | *Thrinax* | Thatch palm |
| GUSC | *Guettarda scabra* | Wild guave |
| ANTEC | *Andropogon ternarius var. cabanisii* | Splitbeard bluestem |
| SCRH | *Schizachyrium rhizomatum* | Florida little bluestem |
| MYFL2 | *Myrsine floridana* | Guianese colicwood |
| DOVI | *Dodonaea viscosa* | Florida hopbush |

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

Disturbance Description

This BpS is classified as a Fire Regime Group I, 1-5yr mean fire return interval, with frequent, low intensity fires occurring at any time of year. Most acreage burns from April to June during the early lightning season. In the Florida Keys mean fire return interval estimates range from 3-10yrs (personnal comm. with Snyder (8/9/2006) and Bergh as reviewer of Rapid Assessment). Less common (1-2 /decade) moderately severe fires associated with drought occur primarily in March to June. Anthropogenic fire was considered but is not expected to change reference class composition.

In the absence of fire, this system may be replaced by hardwoods species within several decades (Stout and Marion 1993).

Fire Frequency

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Severity** | **Avg FI** | **Percent of All Fires** | **Min FI** | **Max FI** |
| Replacement | 426 | 1 |  |  |
| Moderate (Mixed) | 185 | 2 |  |  |
| Low (Surface) | 4 | 97 | 1 | 5 |
| All Fires | 3 | 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

This BpS occurs in patches ranging in size from 200-20,000ac in areas where the soil depth is minimal due to the presence of pinnacle rock. These patches were likely fragmented by the presence of tropical hardwood stands, everglades marsh and cypress domes or savannahs.

Adjacency or Identification Concerns

Pine rocklands are often interrupted by patches of tropical hardwood hammock, which will invade into the pinelands in the absence of fire.

Issues or Problems

The natural fire regime is currently altered by urbanization and artificially controlled water levels. Invasive exotics include Burma reed and Brazilian pepper.

Native Uncharacteristic Conditions

Comments

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 | A | A | A | A | A | A | A | A | A | A |
| 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** |
| ANTEC | Andropogon ternarius var. cabanisii | Splitbeard bluestem | Lower |
| SCRH | Schizachyrium rhizomatum | Florida little bluestem | Lower |
| GUSC | Guettarda scabra | Wild guave | Low-Mid |
| SERE2 | Serenoa repens | Saw palmetto | Low-Mid |

Description

Class A post replacement, includes seedlings, saplings, and poles of south Florida slash pine. Individual tree gaps and clusters interspersed throughout the landscape result from mortality from wind or lightning. The dominant life form includes grasses, forbs and small shrubs.

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

Class B 9 Mid Development 1 - Closed

Indicator Species

|  |  |  |  |
| --- | --- | --- | --- |
| **Symbol** | **Scientific Name** | **Common Name** | **Canopy Position** |
| PIELD | Pinus elliottii var. densa | Florida slash pine | Upper |
| SAPA | Sabal palmetto | Cabbage palmetto | Mid-Upper |
| THRIN | Thrinax | Thatch palm | Middle |
| SERE2 | Serenoa repens | Saw palmetto | Middle |

Description

The dominant life form begins to transition to the shrub layer, primarily saw palmetto and tropical hardwoods. Canopy closure in the shrub layer is increasing with an average height. Class B includes mid-story development of a shrub layer. Hardwood and palm encroachment is becoming increasingly dense. This class may be the result of mosaic hammock fire.

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

Class C 22 Mid Development 1 - Open

Indicator Species

|  |  |  |  |
| --- | --- | --- | --- |
| **Symbol** | **Scientific Name** | **Common Name** | **Canopy Position** |
| PIELD | Pinus elliottii var. densa | Florida slash pine | Upper |
| SERE2 | Serenoa repens | Saw palmetto | Middle |
| ANTEC | Andropogon ternarius var. cabanisii | Splitbeard bluestem | Lower |
| SCRH | Schizachyrium rhizomatum | Florida little bluestem | Lower |

Description

The dominant lifeform remains the grasses and forbs mixed with small isolated patches of shrubs. There has lower tree canopy closure represented by scattered individual slash pines. The understory is comprised of grasses, forbs, low shrubs and palms.

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

Class D 47 Late Development 1 - Open

Indicator Species

|  |  |  |  |
| --- | --- | --- | --- |
| **Symbol** | **Scientific Name** | **Common Name** | **Canopy Position** |
| PIELD | Pinus elliottii var. densa | Florida slash pine | Upper |
| SERE2 | Serenoa repens | Saw palmetto | Middle |
| ANTEC | Andropogon ternarius var. cabanisii | Splitbeard bluestem | Lower |
| SCRH | Schizachyrium rhizomatum | Florida little bluestem | Lower |

Description

The dominant lifeform remains the grasses and forbs mixed with small isolated patches of shrubs. There is low tree canopy closure, with tree diameters up to 21in DBH. The understory is comprised of grasses, forbs, low shrubs and palms.

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

Class E 7 Late Development 1 - Closed

Indicator Species

|  |  |  |  |
| --- | --- | --- | --- |
| **Symbol** | **Scientific Name** | **Common Name** | **Canopy Position** |
| PIELD | Pinus elliottii var. densa | Florida slash pine | Upper |
| SAPA | Sabal palmetto | Cabbage palmetto | Mid-Upper |
| LYLA3 | Lysiloma latisiliquum | False tamarind | Mid-Upper |
| QUVI | Quercus virginiana | Live oak | Mid-Upper |

Description

The dominant lifeform remains the grasses and forbs mixed with small isolated patches of shrubs. With continued exclusion of fire, the transition to tropical hardwood hammock will begin. The dominant species include slash pine, cabbage palm and tropical hardwoods.

*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:OPN | 15 |
| Mid1:OPN | 16 | Late1:OPN | 49 |
| Mid1:CLS | 16 | Late1:CLS | 49 |
| Late1:OPN | 50 | Late1:OPN | 499 |
| Late1:CLS | 50 | Late1:CLS | 499 |

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:CLS | 1 | 1 | Yes | 10 |
| Surface Fire | Early1:ALL | Early1:ALL | 0.333 | 3 | No | 0 |
| Alternative Succession | Mid1:OPN | Mid1:CLS | 1 | 1 | Yes | 10 |
| Wind or Weather or Stress | Mid1:OPN | Early1:ALL | 0.01 | 100 | Yes | 0 |
| Surface Fire | Mid1:OPN | Mid1:OPN | 0.333 | 3 | No | 0 |
| Wind or Weather or Stress | Mid1:CLS | Early1:ALL | 0.01 | 100 | Yes | 0 |
| Replacement Fire | Mid1:CLS | Early1:ALL | 0.025 | 40 | Yes | 0 |
| Mixed Fire | Mid1:CLS | Mid1:CLS | 0.05 | 20 | No | 0 |
| Alternative Succession | Late1:OPN | Late1:CLS | 1 | 1 | Yes | 30 |
| Wind or Weather or Stress | Late1:OPN | Early1:ALL | 0.01 | 100 | Yes | 0 |
| Surface Fire | Late1:OPN | Late1:OPN | 0.333 | 3 | No | 0 |
| Mixed Fire | Late1:CLS | Mid1:CLS | 0.01 | 100 | Yes | 0 |
| Wind or Weather or Stress | Late1:CLS | Early1:ALL | 0.01 | 100 | Yes | 0 |

References

Brown, J.K. and J. Kapler-Smith, eds. 2000. Wildland fire in ecosystems: effects of fire on flora. Gen. Tech. Rep. RMRS-GTR-42. vol 2. Ogden, UT: USDA Forest Service, Rocky Mountain Research Station. 257 pp.

Everglades National Park Fire Management plan and Environmental Assessment (Draft 2003). Everglades National Park.

Myers, R.L. and Ewel, J.J., eds. 1990. Ecosystems of Florida. Orlando, FL: University of Central Florida Press. 765 pp.

National Park Service. 2005 (unpublished). Draft Environmental Assessment: Fire Management Plan, Everglades National Park. Homestead, FL: US Dept. of Interior, National Park Service.

National Park Service. 2005 (unpublished). Draft Fire Management Plan for Everglades National Park. Homestead, FL: US Dept. of Interior, National Park Service.

NatureServe. 2006. International Ecological Classification Standard: Terrestrial Ecological Classifications. NatureServe Central Databases. Arlington, VA, U.S.A. Data current as of 18 July 2006.

NatureServe. 2007. International Ecological Classification Standard: Terrestrial Ecological Classifications. NatureServe Central Databases. Arlington, VA. Data current as of 10 February 2007.

Schmidt, K.M., J.P. Menakis, C.C. Hardy, W.J. Hann and D.L. Bunnell. 2002. Development of coarse-scale spatial data for wildland fire and fuel management. Gen. Tech. Rep. RMRS-GTR-87. Fort Collins, CO: USDA Forest Service, Rocky Mountain Research Station. 41 pp. + CD.

Slocum, M.G., Platt, W.J. and Cooley, H.C. 2003. Effects of Differences in Prescribed Fire Regimes on Patchiness and Intensity of Fires in Subtropical Savannas of Everglades National Park, Florida. Restoration Ecology: 11(1): 91-102.

Snyder, J.R., Ross, M.S., Kopter, S. and Sah, J.P. 2005. Developing Ecological Criteria for Prescribed Fire in South Florida Pine Rockland Ecosystems. USGS Open File Report OF:2006-1062. Available: Http://www.fiu.edu/~serp1/projects/BPK/BPK\_Final\_Report\_2005.pdf

Stout, I.J. and W.R. Marion. 1993. Pine flatwoods and xeric pine forests of the southern (lower) coastal plain. Pages 373-446 in: W.H. Martin, S.G. Boyce and A.C. Echternacht, editors. 1993. Biodiversity of the southeastern United States: Lowland terrestrial communities. John Wiley and Sons, New York.

USDA Forest Service, Rocky Mountain Research Station, Fire Sciences Laboratory (2002, December). Fire Effects Information System, [Online]. Available: http://www.fs.fed.us/database/feis/.