13820

Southern Atlantic Coastal Plain Maritime Forest

BpS Model/Description Version: Aug. 2020

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| None | None | None | None |
| None | None | None | None |

Vegetation Type

Forest and Woodland

Map Zones

55, 58

Geographic Range

This system encompasses a range of woody vegetation present on stabilized upland dunes of barrier islands from central South Carolina (Cooper River) southward to Volusia County, Florida (ca. 28 degrees 30 minutes N latitude) (NatureServe 2006).

Biophysical Site Description

It includes vegetation whose structure and composition are influenced by salt spray, extreme disturbance events and the distinctive climate of the immediate coast. Examples are known from the barrier islands of Georgia and Florida, such as Big Talbot Island, Florida and probably Sapelo Island, Georgia.

Vegetation Description

Vegetation may include different woodland communities dominated by southern pine species. *Pinus palustris, Pinus serotina*, and *Pinus elliottii* var. *elliottii* are all important in documented examples, which have densely shrubby subcanopies and understories with species such as *Quercus virginiana, Quercus geminata, Quercus hemisphaerica, Quercus chapmanii, Quercus myrtifolia*, and *Magnolia grandiflora* (NatureServe 2006).

BpS Dominant and Indicator Species

|  |  |  |
| --- | --- | --- |
| **Symbol** | **Scientific Name** | **Common Name** |
| PIPA2 | *Pinus palustris* | Longleaf pine |
| PIEL | *Pinus elliottii* | Slash pine |
| PISE | *Pinus serotina* | Pond pine |
| QUVI | *Quercus virginiana* | Live oak |
| QUGE2 | *Quercus geminata* | Sand live oak |
| QUHE2 | *Quercus hemisphaerica* | Quercus hemisphaerica |
| QUCH | *Quercus chapmanii* | Chapman oak |
| MAGR4 | *Magnolia grandiflora* | Southern magnolia |

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

Disturbance Description

While salt spray and hurricanes affect the fire frequency by increasing the amount of fine fuel on an intermittent basis, the natural fire frequency is probably 10-15yrs to maintain the mix of scattered pines and low oak species, since the primary carrier of fire is the needle layers and not herbaceous grassy fuel, which are patchy. A lack of fire leads to no regeneration of pines, and an increase in oak density and height, and eventually the oaks dominate (class E). Intense fires at any stage may remove the pines which are oak dominated but are lower, killing all pines.

Fire Frequency

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Severity** | **Avg FI** | **Percent of All Fires** | **Min FI** | **Max FI** |
| Replacement | 69 | 17 |  |  |
| Moderate (Mixed) | 878 | 1 |  |  |
| Low (Surface) | 14 | 82 |  |  |
| All Fires | 12 | 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

Fire is probably patchy, beginning in needle litter and spreading out to receptive oak fuel and patch palmettos, relying on strong coastal winds to drive the fires.

Adjacency or Identification Concerns

As with many higher frequency fire systems, this system exists today in a state of fire exclusion in most natural areas, due to the presence of fire departments on the coast near houses which extinguish fires that start. If we identify the action as trying to drive many sites in class E condition back to class A, there must be a seed source of pines nearby to repopulate the system after a mechanical/fire blend of treatments.

Issues or Problems

It is not known how much has this system been influenced by human interaction, , and it has even been postulated that the presence of pines within this system is an artifact of increased human fire activity from coastal Indian populations.

Native Uncharacteristic Conditions

Lack of fire has led to very dense oak cover, excluding pines and herbaceous species.

Comments

Whereas the modeler has determined a 10-15yr fire frequency as noted in the disturbance description, NatureServe (2006) indicates that unlike maritime vegetation to the north, this system may be more heavily influenced by natural fire regimes that may help to explain the predominance of the fire-tolerant pine species. It has been postulated that the natural fire frequency is from 20-30yrs.

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 | D | D | D | D | E | E |
| Shrub | 0.5-1.0 | A | A | A | A | D | D | D | D | E | E |
| Shrub | 1.0-3.0 | A | A | A | A | D | D | D | D | E | E |
| Shrub | >3.0 | A | A | A | A | D | D | D | D | E | E |
| Tree | 0-5 | B brdlf | B brdlf | B brdlf | B brdlf | B brdlf | B brdlf | B brdlf | B brdlf | B brdlf | B brdlf |
| Tree | 0-5 | B mix | B mix | B mix | B mix | B mix | B mix | B mix | B mix | B mix | B mix |
| Tree | 0-5 | C con | C con | C con | C con | C con | C con | C con | C con | C con | C con |
| Tree | 5-10 | B mix | B mix | B mix | B mix | B mix | B mix | B mix | B mix | B mix | B mix |
| Tree | 5-10 | B brdlf | B brdlf | B brdlf | B brdlf | B brdlf | B brdlf | B brdlf | B brdlf | B brdlf | B brdlf |
| Tree | 5-10 | C con | C con | C con | C con | C con | C con | C con | C con | C con | C con |
| Tree | 10-25 | B brdlf | B brdlf | B brdlf | B brdlf | B brdlf | B brdlf | B brdlf | B brdlf | B brdlf | B brdlf |
| Tree | 10-25 | C con | C con | C con | C con | C con | C con | C con | C con | C con | C con |
| Tree | 10-25 | B mix | B mix | B mix | B mix | B mix | B mix | B mix | B mix | B mix | B mix |
| Tree | 25-50 | B mix | B mix | B mix | B mix | B mix | B mix | B mix | B mix | B mix | B mix |
| Tree | 25-50 | B brdlf | B brdlf | B brdlf | B brdlf | B brdlf | B brdlf | B brdlf | B brdlf | B brdlf | B brdlf |
| Tree | 25-50 | C con | C con | C con | C con | C con | C con | C con | C con | C con | C con |
| Tree | >50 | C con | C con | C con | C con | C con | C con | C con | C con | C con | C con |
| Tree | >50 | B brdlf | B brdlf | B brdlf | B brdlf | B brdlf | B brdlf | B brdlf | B brdlf | B brdlf | B brdlf |
| Tree | >50 | B mix | B mix | B mix | B mix | B mix | B mix | B mix | B mix | B mix | B mix |

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 22 Early Development 1 - All Structures

Indicator Species

|  |  |  |  |
| --- | --- | --- | --- |
| **Symbol** | **Scientific Name** | **Common Name** | **Canopy Position** |
| PIPA2 | Pinus palustris | Longleaf pine | Upper |
| PIEL | Pinus elliottii | Slash pine | Upper |
| QUVI | Quercus virginiana | Live oak | Lower |
| QUGE2 | Quercus geminata | Sand live oak | Lower |

Description

Early post-replacement. Open conditions following fire, pine seedlings recruited, mid-size pines present to provide fuel for future fires, herbaceous species present, oak species also present but in low levels (<1m), resprouting from roots. This class will generate enough fuel to burn occasionally. If no fire occurs in a few years, the oak layers begin to increase.

Upper Layer Lifeform is not the dominant lifeform. The oak layer is really the dominant layer here but canopy closure and min/max height is very similar to the tree layer as trees are just starting to be recruited. 0-30% canopy closer; 0.6-1m height.

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

Class B 11 Mid Development 1 - Closed

Indicator Species

|  |  |  |  |
| --- | --- | --- | --- |
| **Symbol** | **Scientific Name** | **Common Name** | **Canopy Position** |
| PIPA2 | Pinus palustris | Longleaf pine | Upper |
| PIEL | Pinus elliottii | Slash pine | Upper |
| QUVI | Quercus virginiana | Live oak | Low-Mid |
| QUGE2 | Quercus geminata | Sand live oak | Low-Mid |

Description

Mid-closed. Pines still present, but now the needle layer that fuels the fires is shaded out by increase in oak density and height. Fires now are either patchy or stand-replacement, which may or may not kill the existing pines based on the other stresses in the system, including salt and hurricanes. Patchy, incomplete fires tend to keep this class as it is, but more than likely it will succeed to a class which is denser oaks and has no pine regeneration at all.

Upper Layer Lifeform is not the dominant lifeform. The oak layer is really the dominant layer here but canopy closer is very similar to the tree layer as oaks continue to persist and grow in the absence of fire. 0-40% canopy closure; 1.1-3.1m height.

*Maximum Tree Size Class*  
Large 21-33"DBH

Class C 32 Mid Development 1 - Open

Indicator Species

|  |  |  |  |
| --- | --- | --- | --- |
| **Symbol** | **Scientific Name** | **Common Name** | **Canopy Position** |
| PIPA2 | Pinus palustris | Longleaf pine | Upper |
| PIEL | Pinus elliottii | Slash pine | Upper |
| QUVI | Quercus virginiana | Live oak | Lower |
| QUGE2 | Quercus geminata | Sand live oak | Lower |

Description

Mid-open. Mixed larger pines, with low oak levels and density. With regular fires, class C will remain stable, since larger pines provide the necessary needle litter for fuel. Fires are patchy, and spread from needles to palmettos and oaks present.

Upper Layer Lifeform is not the dominant lifeform. The oak layer is really the dominant lifeform, but the pines have shot above the oak layer. 0-40% canopy closure; 0.6-1m height.

*Maximum Tree Size Class*  
Large 21-33"DBH

Class D 17 Late Development 1 - Open

Indicator Species

|  |  |  |  |
| --- | --- | --- | --- |
| **Symbol** | **Scientific Name** | **Common Name** | **Canopy Position** |
| QUVI | Quercus virginiana | Live oak | Low-Mid |
| QUGE2 | Quercus geminata | Sand live oak | Low-Mid |
| QUCH | Quercus chapmanii | Chapman oak | Low-Mid |
| QUHE2 | Quercus hemisphaerica | Quercus hemisphaerica | Low-Mid |

Description

Late open. Oaks will fill in the gaps and grow much more quickly than herbaceous species, and so this class will be comprised of oaks, with potential for pine recruitment in open patches. Not much chance for fire here, since major fuel (needles, palmettos) are lacking.

*Maximum Tree Size Class*  
None

Class E 18 Late Development 1 - Closed

Indicator Species

|  |  |  |  |
| --- | --- | --- | --- |
| **Symbol** | **Scientific Name** | **Common Name** | **Canopy Position** |
| QUVI | Quercus virginiana | Live oak | Mid-Upper |
| QUGE2 | Quercus geminata | Sand live oak | Mid-Upper |
| QUCH | Quercus chapmanii | Chapman oak | Mid-Upper |
| QUHE2 | Quercus hemisphaerica | Quercus hemisphaerica | Mid-Upper |

Description

Late closed. Large, dense oaks will be the dominant vegetation. The intense fire from this class should kill many oaks, and allow for pine seedling recruitment from nearby areas. Many examples of this ecosystem in urban settings are comprised of this class.

*Maximum Tree Size Class*  
None

Model Parameters

Deterministic Transitions

|  |  |  |  |
| --- | --- | --- | --- |
| **From Class** | **Begins at (yr)** | **Succeeds to** | **After (years)** |
| Early1:ALL | 0 | Mid1:OPN | 15 |
| Mid1:OPN | 16 | Late1:OPN | 60 |
| Mid1:CLS | 16 | Late1:CLS | 60 |
| Late1:OPN | 61 | Late1:OPN | 999 |
| Late1:CLS | 61 | Late1:CLS | 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:CLS | 1 | 1 | Yes | 14 |
| Surface Fire | Early1:ALL | Early1:ALL | 0.1 | 10 | No | 0 |
| Alternative Succession | Mid1:OPN | Mid1:CLS | 1 | 1 | Yes | 25 |
| Replacement Fire | Mid1:OPN | Early1:ALL | 0.02 | 50 | Yes | 0 |
| Surface Fire | Mid1:OPN | Mid1:OPN | 0.1 | 10 | No | 0 |
| Mixed Fire | Mid1:CLS | Mid1:OPN | 0.01 | 100 | Yes | 0 |
| Replacement Fire | Mid1:CLS | Early1:ALL | 0.033 | 30 | Yes | 0 |
| Alternative Succession | Late1:OPN | Late1:CLS | 1 | 1 | Yes | 50 |
| Replacement Fire | Late1:OPN | Early1:ALL | 0.02 | 50 | Yes | 0 |
| Surface Fire | Late1:OPN | Late1:OPN | 0.1 | 10 | No | 0 |
| Replacement Fire | Late1:CLS | Early1:ALL | 0.005 | 200 | Yes | 0 |

References

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