13610

Central Atlantic Coastal Plain Maritime Forest

BpS Model/Description Version: Aug. 2020

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| --- | --- | --- | --- |
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Vegetation Type

Forest and Woodland

Map Zones

58,60

Geographic Range

This system is found from southernmost VA to central SC (NatureServe 2006).

Biophysical Site Description

This system encompasses most woody vegetation of Atlantic Coast barrier islands and similar coastal strands, from Virginia Beach to central SC (approximately the Santee River where the Sea Islands occur). It includes forests and shrublands whose structure and composition are influenced by salt spray, extreme disturbance events, and the distinctive climate of the immediate coast (NatureServe 2006).

Occurs on barrier islands, and on coastal strands where barrier islands are lacking, but seldom or never more than 2 or 3 miles from the ocean. Chronic salt spray is an important influence on vegetation structure and composition. However, the extent to which plant communities found in this system are shaped by salt spray varies. Examples closest to the coast are most likely to exhibit classic streamlined canopy shape due to spray sculpting and are less likely to support salt-intolerant plant species. Heavier salt spray often determines the boundary of this system with Atlantic Coastal Plain Southern Dune and Maritime Grassland (CES203.273). It requires some shelter from the ocean, in the form of high dunes or extensive sand flats, to develop. This system may occur from the top of interior dunes to wet swales. Soils are sandy, except for mucks in the wettest swamps. Soils range from excessively drained to permanently saturated. They are presumably low in nutrient-holding capacity, but input of nutrients in salt spray probably makes this system fairly fertile. Topography and apparent moisture may vary widely with little change in vegetation. The ocean's moderation of climate may be a significant factor in the character of this system. A number of plant species extend much farther north in the maritime forests than they do even a few miles inland (NatureServe 2006).

Vegetation Description

Vegetation includes shrublands and forests. Shrubland dominated by salt-tolerant shrubs such as Morella cerifera and Ilex vomitoria or by stunted trees often occurs on the seaward edge where salt spray is heavier. Forests are typically dominated by a small set of salt-tolerant evergreen trees, mainly Quercus virginiana, Quercus hemisphaerica, Pinus taeda, and in the southern portions, Sabal palmetto. Rare forested wetlands are dominated by a variety of wetland tree species, including Acer rubrum, Nyssa biflora and Taxodium distichum. A few of the most sheltered areas near the northern end of the range have forests with deciduous species such as Fagus grandifolia and Quercus falcata. Also included are embedded freshwater depressional wetlands dominated by shrubs or small trees, such as Cornus foemina, Persea palustris or Salix caroliniana. Communities tend to be low in species richness, with all strata limited to a set of salt-tolerant species (NatureServe 2006).

BpS Dominant and Indicator Species

|  |  |  |
| --- | --- | --- |
| **Symbol** | **Scientific Name** | **Common Name** |
| MOCE2 | *Morella cerifera* | Wax myrtle |
| QUVI | *Quercus virginiana* | Live oak |
| ILVO | *Ilex vomitoria* | Yaupon |
| QUHE2 | *Quercus hemisphaerica* | Quercus hemisphaerica |
| SAPA | *Sabal palmetto* | Cabbage palmetto |
| PITA | *Pinus taeda* | Loblolly pine |
| ACRU | *Acer rubrum* | Red maple |
| NYBI | *Nyssa biflora* | Swamp tupelo |

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

Disturbance Description

Maritime forests occur in the most stable portions of barrier islands, but the maritime environment is still extremely dynamic. Geologic processes such as destruction of dunes by storms or slow movement of dunes may quickly or slowly destroy the environment this system needs. Sand movement may also create new sites for this system to occupy. Extreme salt spray or saltwater flooding in storms can severely disturb vegetation, though it recovers if the landforms have not been altered. Fire may have naturally occurred infrequently in this system, but probably was not an important factor. Wind events and hurricane events will have significant impacts over this system (NatureServe 2006).

Fire Frequency

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Severity** | **Avg FI** | **Percent of All Fires** | **Min FI** | **Max FI** |
| Replacement | 355 | 14 | 192 | 2000 |
| Moderate (Mixed) | 118 | 42 | 67 | 181 |
| Low (Surface) | 112 | 44 | 85 | 286 |
| All Fires | 50 | 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

Occurs as small to medium patches. Patch size varies naturally with the character of barrier islands. South-facing islands tend to have more extensive dunes that provide shelter for extensive, contiguous maritime forests. East-facing islands tend to naturally have discontinuous dunes and only small patches sheltered enough to support maritime forests. Presettlement vegetation had a few occurrences of several thousand acres, but only a couple as large as 1000 acres remain. Most occurrences now are artificially bounded remnants or naturally small patches of tens to hundreds of acres (NatureServe 2006).

Adjacency or Identification Concerns

Similar Ecological Systems include: Atlantic Coastal Plain Southern Dune and Maritime Grassland (CES203.273); Atlantic Coastal Plain Southern Maritime Forest (CES203.537)--occurs to south; and Northern Atlantic Coastal Plain Maritime Forest (CES203.302)--occurs to north (NatureServe 2006)

Atlantic Coastal Plain Southern Maritime Forest (CES203.537) occurs south of this system where barrier islands give way to sea islands (central South Carolina, approximately Santee River). Sea islands are wider and more extensive and their size may contribute to a greater ecological influence of fire resulting in a greater component of Pinus elliottii and Pinus palustris in maritime forests occurring there.

Northern Atlantic Coastal Plain Maritime Forest (CES203.302) occurs north of this system where deciduous trees come to prevail in the maritime forests [see Bellis (1992)] at approximately 37 degrees North latitude. There is a zone where both evergreen and deciduous forests occur (from approximately Nags Head, North Carolina, to Virginia Beach, Virginia), making the geographic boundary between the two systems somewhat unclear. The boundary of cold and warm offshore waters near Cape Hatteras may be an important climatic influence. This system is separated from Atlantic Coastal Plain Southern Dune and Maritime Grassland (CES203.273) by the dominance of woody vegetation, which corresponds to increased shelter from salt spray and increased stability of landforms (NatureServe 2006).

Adjacent Ecological Systems include: Atlantic Coastal Plain Central Salt and Brackish Tidal Marsh (CES203.270); Atlantic Coastal Plain Southern Dune and Maritime Grassland (CES203.273); Southeastern Coastal Plain Interdunal Wetland (CES203.258) (NatureServe 2006).

Atlantic Coastal Plain Central Maritime Forest is always bordered by Atlantic Coastal Plain Southern Dune and Maritime Grassland (CES203.273) on the seaward side, and sometimes surrounded by them. May border tidal salt marshes on the back of barrier islands (NatureServe 2006).

Issues or Problems

Native Uncharacteristic Conditions

Comments

This BpS was described almost entirely from the ecological description from NatureServe (2006) for CES203.261 - Atlantic Coastal Plain Central Maritime Forest.

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 | UN | UN | UN | UN | UN | UN | UN | UN | UN | UN |
| Herb | 0.5-1.0 | UN | UN | UN | UN | UN | UN | UN | UN | UN | UN |
| Herb | >1.0 | UN | UN | UN | UN | UN | UN | UN | UN | UN | UN |
| Shrub | 0-0.5 | A | A | A | A | A | A | A | UN | UN | UN |
| Shrub | 0.5-1.0 | A | A | A | A | A | A | A | UN | UN | UN |
| Shrub | 1.0-3.0 | A | A | A | A | A | A | A | UN | UN | UN |
| Shrub | >3.0 | A | A | A | A | A | A | A | UN | UN | UN |
| Tree | 0-5 | C | C | C | C | UN | UN | B | B | UN | UN |
| Tree | 5-10 | UN | UN | UN | UN | D | D | UN | UN | E | E |
| Tree | 10-25 | UN | UN | UN | UN | UN | UN | UN | UN | UN | UN |
| Tree | 25-50 | UN | UN | UN | UN | UN | UN | UN | UN | UN | UN |
| Tree | >50 | UN | UN | UN | UN | UN | UN | UN | UN | UN | UN |

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 7 Early Development 1 - All Structures

Indicator Species

|  |  |  |  |
| --- | --- | --- | --- |
| **Symbol** | **Scientific Name** | **Common Name** | **Canopy Position** |
| MOCE2 | Morella cerifera | Wax myrtle | Lower |
| ILVO | Ilex vomitoria | Yaupon | Lower |
| QUVI | Quercus virginiana | Live oak | Lower |

Description

At age zero the vegetation structure is classified as a mixture of shrubs, live oak seedlings and other herbaceous plants. Wind, weather and climate dominate this system. Influences from wind, salt spray, ocean over wash all act upon the formation of this forest structure. At age zero the system is dominated by shrubs/herb species and advances to a shrub/tree co-dominated system. Severe weather events such as hurricanes and coastal storms with high winds, salt spray and ocean over wash can result in stand replacement by creating openings within the this class. Severe fire events of high intensity will top kill the canopy and create openings within the stand that can result in setting the affected area back to age zero.

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

Class B 22 Mid Development 1 - Closed

Indicator Species

|  |  |  |  |
| --- | --- | --- | --- |
| **Symbol** | **Scientific Name** | **Common Name** | **Canopy Position** |
| MOCE2 | Morella cerifera | Wax myrtle | Low-Mid |
| ILVO | Ilex vomitoria | Yaupon | Low-Mid |
| QUVI | Quercus virginiana | Live oak | Upper |

Description

System advances to a live oak dominated canopy with shrubs associated along edges and forest openings. Common shrubs include yaupon and wax myrtle. Existing herbaceous layer continues to decline to very low levels due to shading. Shrubs along the edge and openings of tree stands blend into the tree canopy forming a contiguous green umbrella that creates a shield to wind and weather events. Severe weather events such as hurricanes and coastal storms with high winds, salt spray and ocean over wash can result in stand replacement by creating openings within the this class. Severe fire events of high intensity will top kill the canopy and create openings within the stand that can result in setting the affected area back to age zero. In the absence of distrurbance, this system will advance to a late development closed system.

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

Class C 7 Mid Development 1 - Open

Indicator Species

|  |  |  |  |
| --- | --- | --- | --- |
| **Symbol** | **Scientific Name** | **Common Name** | **Canopy Position** |
| MOCE2 | Morella cerifera | Wax myrtle | Mid-Upper |
| ILVO | Ilex vomitoria | Yaupon | Mid-Upper |
| QUVI | Quercus virginiana | Live oak | Upper |

Description

System advances to a live oak dominated canopy with shrubs associated along edges and openings. This system is maintained in a more open state through weather events and replacement fires. Severe weather events such as hurricanes and coastal storms with high winds, salt spray and ocean over wash can result in stand replacement by creating openings within this class. Severe fire events of high intensity will top kill the canopy and create openings within the stand that can result in setting the affected area back to age zero. Openings can result from environmental forces that affect oak regeneration. Weather and to a lesser extent fire play a major role in maintaining this system in an open condition. With extended periods of favorable conditions (No fire-No Storms) this system may advance to the late development closed system.

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

Class D 13 Late Development 1 - Open

Indicator Species

|  |  |  |  |
| --- | --- | --- | --- |
| **Symbol** | **Scientific Name** | **Common Name** | **Canopy Position** |
| MOCE2 | Morella cerifera | Wax myrtle | Mid-Upper |
| ILVO | Ilex vomitoria | Yaupon | Mid-Upper |
| QUVI | Quercus virginiana | Live oak | Upper |

Description

System has advanced into older age class. The canopy is dominated by live oak with shrubs associated along edges and openings. This system is maintained in a more open state through weather events and replacement fires. Severe weather events such as hurricanes and coastal storms with high winds, salt spray and ocean over wash can result in stand replacement by creating openings within the this class. Severe fire events of high intensity will top kill the canopy and create openings within the stand that can result in setting the affected area back to age zero. Openings can result from environmental forces that affect oak regeneration. Weather and to a lesser extent fire play a major role in maintaining this system in an open condition.

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

Class E 51 Late Development 1 - Closed

Indicator Species

|  |  |  |  |
| --- | --- | --- | --- |
| **Symbol** | **Scientific Name** | **Common Name** | **Canopy Position** |
| MOCE2 | Morella cerifera | Wax myrtle | Mid-Upper |
| ILVO | Ilex vomitoria | Yaupon | Mid-Upper |
| QUVI | Quercus virginiana | Live oak | Upper |

Description

System has advanced into older age class. The canopy is dominated by live oak with associated shrubs. Existing herbaceous layer is absent due to shading. Dense shading and low fuel loads make significant fire events rare. Shrubs along the edge and openings of tree stands blend into the tree canopy forming a contiguous green umbrella that creates a shield to wind and weather events. Severe weather events such as hurricanes and coastal storms with high winds, salt spray and ocean over wash can result in stand replacement by creating openings within this class. Severe fire events of high intensity will top kill the canopy and create openings within the stand that can result in setting the affected area back to age zero. In the absence of disturbance this system will continue as a late development closed system.

*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 | 20 |
| Mid1:OPN | 21 | Late1:OPN | 100 |
| Mid1:CLS | 21 | Late1:CLS | 100 |
| Late1:OPN | 101 | Late1:OPN | 999 |
| Late1:CLS | 101 | 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 | 19 |
| Wind or Weather or Stress | Early1:ALL | Early1:ALL | 0.01 | 100 | Yes | 0 |
| Surface Fire | Early1:ALL | Early1:ALL | 0.03 | 33 | No | 0 |
| Replacement Fire | Mid1:OPN | Early1:ALL | 0.003 | 333 | Yes | 0 |
| Wind or Weather or Stress | Mid1:OPN | Early1:ALL | 0.005 | 200 | Yes | 0 |
| Alternative Succession | Mid1:OPN | Late1:CLS | 0.06 | 17 | Yes | 0 |
| Replacement Fire | Mid1:CLS | Early1:ALL | 0.003 | 333 | Yes | 0 |
| Wind or Weather or Stress | Mid1:CLS | Early1:ALL | 0.005 | 200 | Yes | 0 |
| Mixed Fire | Mid1:CLS | Mid1:OPN | 0.015 | 67 | Yes | 0 |
| Surface Fire | Mid1:CLS | Mid1:CLS | 0.03 | 33 | No | 0 |
| Replacement Fire | Late1:OPN | Early1:ALL | 0.003 | 333 | Yes | 0 |
| Wind or Weather or Stress | Late1:OPN | Early1:ALL | 0.005 | 200 | Yes | 0 |
| Mixed Fire | Late1:OPN | Late1:OPN | 0.04 | 25 | No | 0 |
| Wind or Weather or Stress | Late1:CLS | Late1:OPN | 0.002 | 500 | Yes | 0 |
| Replacement Fire | Late1:CLS | Early1:ALL | 0.003 | 333 | Yes | 0 |
| Wind or Weather or Stress | Late1:CLS | Early1:ALL | 0.005 | 200 | Yes | 0 |

References

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