14540

East Gulf Coastal Plain Near-Coast Pine Flatwoods

Model version: 2018

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| --- | --- | --- | --- |
| **Modelers** |  | **Reviewers** |  |
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Vegetation Type

Mixed Upland and Wetland

Map Zones

55, 56, 99

Geographic Range

This system of open forests or woodlands occupies broad, sandy flatlands in a relatively narrow band along the northern Gulf of Mexico coast east of the Mississippi River (see map in Peet and Allard [1993]). This range corresponds roughly to Ecoregion 75a (EPA 2004) (NatureServe 2006).

Biophysical Site Description

This Biophysical Setting (BpS) occupies broad, sandy flatlands, which are subject to high fire return intervals (FRIs) even though they are subject to seasonally high water tables. These areas are often called "flatwoods" or "flatlands" (NatureServe 2006).

Vegetation Description

Overstory vegetation is characterized by *Pinus palustris* and to a lesser degree by *Pinus elliottii*. Some stands include *Pinus serotina*. Understory conditions range from densely shrubby to open and herbaceous-dominated, based largely upon fire history (NatureServe 2006). Shrubs include *Quercus geminata*, *Quercus minima* -- *Quercus pumila*, *Serenoa repens*, *Cyrilla racemiflora*, *Ilex coriacea*, *Ilex glabra*, *Ilex vomitoria*, and *Lyonia lucida*. Herbaceous species may include *Aristida beyrichiana*, *Ctenium aromaticum*, *Muhlenbergia expansa*, *Schizachyrium scoparium*, *Sporobolus floridanus*, *Carphephorus pseudoliatris*, *Sarracenia alata*, *Agalinis filicaulis*, *Polygala cymosa*, *Rhynchospora* spp., and *Helianthus radula* (NatureServe 2006).

BpS Dominant and Indicator Species

|  |  |  |
| --- | --- | --- |
| **Symbol** | **Scientific Name** | **Common Name** |
| PIPA2 | *Pinus palustris* | Longleaf pine |
| QUGE2 | *Quercus geminata* | Sand live oak |
| QUMI2 | *Quercus minima* | Dwarf live oak |
| SERE2 | *Serenoa repens* | Saw palmetto |
| CYRA | *Cyrilla racemiflora* | Swamp titi |
| ILCO | *Ilex coriacea* | Large gallberry |
| ILGL | *Ilex glabra* | Inkberry |
| ARBE7 | *Aristida beyrichiana* | Beyrich threeawn |

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

Disturbance Description

These areas, often called "flatwoods" or "flatlands," are subject to high FRIs even though they are subject to seasonally high water tables (NatureServe 2006).

Frequent surface fires, often occurring every 1-3yrs but ranging up to 5yr intervals, generally burn most of the vegetation. The mean fire return interval is skewed toward the more frequent end of this range. Fires are usually low to moderate in intensity overall, generally resulting in topkill of the lower and middle layers, but periodically will kill young regeneration patches and occasionally individual older trees. Although fire can occur in any season, in pre-European settlement times many lightning fires probably occurred during the dry summer season, although Native Americans were common in these areas and represented a significant ignition source. In this landscape, frequency is more important than seasonality, as long as the season of burn is varied periodically. This community is subjected to hurricanes, which may cause thinning of stands, localized blowdown or uprooting of stands, or perhaps rarely blowdowns or larger areas. Flooding may cause vegetation changes at ecotones with wetland types.

An increase in hurricanes due to climate warming could increase the amount of localized blowdowns. This could increase the percentage of moderate fire frequencies.

Fire Frequency

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Severity** | **Avg FI** | **Percent of All Fires** | **Min FI** | **Max FI** |
| Replacement | 99 | 3 | -1 | 5 |
| Moderate (Mixed) | 479 | 1 | 1 |  |
| Low (Surface) | 3 | 96 | 100 | 1 |
| All Fires | 3 | 100 | 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.

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

Low-intensity fires may have ranged in size from very small to 1,000s of acres pre-fragmentation. Replacement fires may have been localized to <1ac or as large as 100s of acres. Hurricane and wind damage may have ranged from single trees to a few tens of acres scattered in the landscape. Flooding disturbance probably was limited to a few acres. Patch size of this type may range from 10ac to 1,000s of acres, forming the matrix within which other types are imbedded, especially in Florida.

Adjacency or Identification Concerns

Mesic-dry flatwoods exists as matrix in which many other types occur, often due to slight elevation changes, fire shadows, or strips parallel to extended elevation gradients between uplands and wetlands. In dry locations, it may grade into more upland pine savannas. The wetter end may grade into cypress depressions, marshes, or wet prairies.

Similar Ecological Systems noted by NatureServe (2006) include: Atlantic Coastal Plain Southern Wet Pine Savanna and Flatwoods (CES203.536) (BpS 1450); Central Florida Pine Flatwoods (CES203.382) (BpS 1453); and East Gulf Coastal Plain Interior Upland Longleaf Pine Woodland (CES203.496) (BpS 1349).

Issues or Problems

Native Uncharacteristic Conditions

Comments

The VDDT model was adopted from BpS 1450 -- Atlantic Coastal Plain Southern Wet Pine Savanna and Flatwoods. This BpS is very similar to 1450, but much of the descriptive information was pulled from NatureServe (2006).

Reviewer (Smith) combined MZ99 with MZ55 and MZ56 during final stages of the 2017 BpS review process. The model and description from MZ99 did not fully reflect the concept description on NatureServe Explorer nor some of the text in the original BpS description, and was very different from the MZ55/56 model and description without justification (same model developer).

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 | A | A | A | A | A | A | A | A | A | A |
| 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 | 10-25 | B brdlf | B brdlf | B brdlf | B brdlf | B brdlf | B brdlf | B brdlf | B brdlf | B brdlf | B brdlf |
| Tree | 25-50 | E mix | E mix | E mix | E mix | E mix | E mix | E mix | E mix | E mix | E mix |
| Tree | 25-50 | D con | D con | D con | D con | D con | D con | D con | D con | D con | D con |
| Tree | 25-50 | E brdlf | E brdlf | E brdlf | E brdlf | E brdlf | E brdlf | E brdlf | E brdlf | E brdlf | E brdlf |
| Tree | >50 | E brdlf | E brdlf | E brdlf | E brdlf | E brdlf | E brdlf | E brdlf | E brdlf | E brdlf | E brdlf |
| Tree | >50 | E mix | E mix | E mix | E mix | E mix | E mix | E mix | E mix | E mix | E mix |
| Tree | >50 | D con | D con | D con | D con | D con | D con | D con | D con | D con | D con |

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 17 Early Development 1 - All Structures

Indicator Species

|  |  |  |  |
| --- | --- | --- | --- |
| **Symbol** | **Scientific Name** | **Common Name** | **Canopy Position** |
| PIPA2 | Pinus palustris | Longleaf pine | Upper |
| ILGL | Ilex glabra | Inkberry | Lower |
| ILVO | Ilex vomitoria | Yaupon | Lower |

Description

Class A is a post-replacement stage of longleaf pine regeneration that occurs within canopy gaps, mostly single tree to quarter acre in size or larger areas after major storms. The native ground cover consists of *Ilex glabra* seedlings: panic grasses, toothache grass, wiregrasses may also occur. Herbaceous species may include bog buttons, yellow-eyed grasses, and pitcher plants.

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

Class B 6 Mid Development 1 - Closed

Indicator Species

|  |  |  |  |
| --- | --- | --- | --- |
| **Symbol** | **Scientific Name** | **Common Name** | **Canopy Position** |
| PIPA2 | Pinus palustris | Longleaf pine | Upper |
| ILGL | Ilex glabra | Inkberry | Low-Mid |
| ILVO | Ilex vomitoria | Yaupon | Low-Mid |

Description

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

Class B is characterized as a mid-seral closed stage with patches, mostly quarter acre or less in size, of canopy pines and a substantial component of shrubs such as *Ilex glabra* and other *Ilex* spp. encroaching in the absence of fire. The shrub presence is high. The canopy pine cover has a wide range, distinguished from Class C by a greater presence of a hardwood midstory. The shrub component can be significant in the absence of fire.

Class C 34 Mid Development 1 - Open

Indicator Species

|  |  |  |  |
| --- | --- | --- | --- |
| **Symbol** | **Scientific Name** | **Common Name** | **Canopy Position** |
| PIPA2 | Pinus palustris | Longleaf pine | Upper |
| ILGL | Ilex glabra | Inkberry | Low-Mid |
| ILVO | Ilex vomitoria | Yaupon | Low-Mid |

Description

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

Class C is characterized by a mid-seral open condition with a continuous canopy of pines and a minimal hardwood component due to frequent fire. The canopy pine cover range is wide. The ground cover is mostly sparse grasses due to shading of shrubs above.

Class D 34 Late Development 1 - Open

Indicator Species

|  |  |  |  |
| --- | --- | --- | --- |
| **Symbol** | **Scientific Name** | **Common Name** | **Canopy Position** |
| PIPA2 | Pinus palustris | Longleaf pine | Upper |
| ILGL | Ilex glabra | Inkberry | Low-Mid |
| ILVO | Ilex vomitoria | Yaupon | Low-Mid |

Description

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

Class D is characterized by a late-seral open condition with a continuous canopy of pines and a minimal component of hardwoods. The ground cover is sparse with few scattered grasses with some shrub presence such as *Ilex glabra* and *Ilex vomitoria*.

Class E 9 Late Development 1 - Closed

Indicator Species

|  |  |  |  |
| --- | --- | --- | --- |
| **Symbol** | **Scientific Name** | **Common Name** | **Canopy Position** |
| PIPA2 | Pinus palustris | Longleaf pine | Upper |
| QUERC | Quercus | Oak | Mid-Upper |
| ILGL | Ilex glabra | Inkberry | Middle |
| ILVO | Ilex vomitoria | Yaupon | Middle |

Description

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

Class E is characterized by a late-seral closed stage with patches of canopy pines and a substantial component of hardwoods in either the overstory or midstory. The ground cover is shrubby-dominated. The hardwood and encroaching pine cover is high. The hardwood component differentiates this class from Class D.

Model Parameters

Deterministic Transitions

|  |  |  |  |
| --- | --- | --- | --- |
| **From Class** | **Begins at (yr)** | **Succeeds to** | **After (years)** |
| Early1:ALL | 0 | Mid1:OPN | 14 |
| Mid1:OPN | 15 | Late1:OPN | 60 |
| Mid1:CLS | 15 | 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 | 10 |
| Replacement Fire | Early1:ALL | Early1:ALL | 0.02 | 50 | Yes | 0 |
| Surface Fire | Early1:ALL | Early1:ALL | 0.3 | 3 | No | 0 |
| Alternative Succession | Mid1:OPN | Mid1:CLS | 1 | 1 | Yes | 12 |
| Wind or Weather or Stress | Mid1:OPN | Early1:ALL | 0.005 | 200 | Yes | 0 |
| Replacement Fire | Mid1:OPN | Early1:ALL | 0.01 | 100 | Yes | 0 |
| Surface Fire | Mid1:OPN | Mid1:OPN | 0.33 | 3 | No | 0 |
| Wind or Weather or Stress | Mid1:CLS | Mid1:CLS | 0.005 | 200 | No | 0 |
| Replacement Fire | Mid1:CLS | Early1:ALL | 0.01 | 100 | Yes | 0 |
| Mixed Fire | Mid1:CLS | Mid1:OPN | 0.02 | 50 | Yes | 0 |
| Surface Fire | Mid1:CLS | Mid1:CLS | 0.31 | 3 | No | 0 |
| Alternative Succession | Late1:OPN | Late1:CLS | 1 | 1 | Yes | 12 |
| Insects or Disease | Late1:OPN | Early1:ALL | 0.002 | 500 | Yes | 0 |
| Wind or Weather or Stress | Late1:OPN | Early1:ALL | 0.005 | 200 | Yes | 0 |
| Replacement Fire | Late1:OPN | Early1:ALL | 0.005 | 200 | Yes | 0 |
| Surface Fire | Late1:OPN | Late1:OPN | 0.3 | 3 | No | 0 |
| Wind or Weather or Stress | Late1:CLS | Early1:ALL | 0.0043 | 233 | Yes | 0 |
| Mixed Fire | Late1:CLS | Late1:OPN | 0.01 | 100 | Yes | 0 |
| Replacement Fire | Late1:CLS | Early1:ALL | 0.01 | 100 | Yes | 0 |
| Surface Fire | Late1:CLS | Late1:CLS | 0.31 | 3 | No | 0 |

Model Parameters

References

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