13580

East-Central Texas Plains Southern Pine Forest and Woodland

BpS Model/Description Version: Aug. 2020

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

Forest and Woodland

Map Zones

35, 36

Geographic Range

This Biophysical Setting (BpS) occurs in map zone (MZ) 35, in ECOMAP subsection 255Cc. The BpS is limited to Bastrop, Fayette, Caldwell, and Lee counties of Texas. Extends west to Monahans and out into the South Sandy Plains.

Biophysical Site Description

This BpS mainly occurs on upland ridges and slopes, underlain by the rocky loams of the Jedd Series; the fine sandy loams of the Axtell, Rosansky, and Tabor Series; the loamy fine sands of the Silstid Series; and to a lesser extent the deep sands of the Patillo Series complex (Keith 2002).

Vegetation Description

This BpS consists of forests and woodlands dominated by loblolly pine (*P. taeda*) with co-dominants including sand post oak (*Quercus margarettiae*), post oak (*Quercus stellata*), blackjack oak (*Q. marilandica*), and black hickory (*Carya texana*). In areas with frequent fire, the understory would be dominated by native perennial grasses and forbs such as little bluestem (*Schizachyrium scoparium*), big bluestem (*Andropogon gerardii*), pinewoods dropseed (*Sporobolus junceus*), asters (*Symphiotrichum* spp.), and bracken fern (*Pteridium aquilinum*). In the absence of fire, shrubs and vines would be much more prevalent, including yaupon (*Ilex vomitoria*), American beautyberry (*Callicarpa americana*), Virginia creeper (*Parthenocissus quinquefolia*), and greenbriar (*Smilax* spp.). Historically (pre-European settlement), forest composition was dominated by loblolly pine (50-70ft tall) and widely scattered oaks on xeric sites. Forest structure ranged from open woodlands with a distinct herbaceous component to moderately dense stands with low to moderate vascular plant diversity in the understory.

BpS Dominant and Indicator Species

|  |  |  |
| --- | --- | --- |
| **Symbol** | **Scientific Name** | **Common Name** |
| PITA | *Pinus taeda* | Loblolly pine |
| QUST | *Quercus stellate* | Post oak |
| QUMA3 | *Quercus marilandica* | Blackjack oak |
| CATE9 | *Carya texana* | Black hickory |
| SCHIZ4 | *Schizachyrium* | Little bluestem |
| ANGE | *Andropogon gerardii* | Big bluestem |
| SPJU | *Sporobolus junceus* | Pineywoods dropseed |
| QUMA6 | *Quercus margarettiae* | Runner oak |

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

Disturbance Description

This BpS is fire regime group I. Naturally this system had frequent fire dominated by low-intensity surface fires with occasional mixed fire in drought years and rare stand-replacement fires in extreme dry years in the closed classes (Class B and Class E) or more frequently in the shrub stage (Class A). Drought and moist cycles play a strong role interacting with both fire frequency and intensity. Other disturbance factors that played a smaller role included ice storms, wind events, and insect infestations.

Fire Frequency Results

|  |  |  |
| --- | --- | --- |
| **Severity** | **Min FI** | **Max FI** |
| Replacement |  |  |
| Moderate (Mixed) |  |  |
| Low (Surface) |  |  |
| **All Fires** |  |  |

Scale Description

An extremely restricted community, with >90% of the existing community restricted to Bastrop County. Where this BpS does occur, it tends to occur in larger patches from 100-20,000ac. Current distribution of this BpS is restricted to the loblolly pine forest that occurs between Highway 290 and the Colorado River in Bastrop County (approximately 75,000ac). There are other mixed pine/oak communities north of Highway 290 and south of the Lee County line in Bastrop County. Currently, there are a few isolated scattered communities in Fayette and Lee counties.

Adjacency or Identification Concerns

Due to the pine component of this BpS, this community should easily stand out from adjacent vegetation types. The current distribution of this BpS is restricted primarily to Bastrop County.

Issues or Problems

This BpS in its current state is primarily in a closed-canopy state, with a dense understory of yaupon (*Ilex vomitoria*). This closed condition and understory component leads to excessive needle drape and potential for extreme fire behavior. Fuel in this area has produced moderate to intense fire behavior within a day of a moderate precipitation event (0.50-2.0in). Another major concern linked to the fuel and fire behavior is the urban development in the area, causing a major urban wildland interface issue.

Native Uncharacteristic Conditions

This BpS in its current state is primarily in a closed-canopy state, with a dense understory and very little herbaceous vegetation. In the absence of fire and or other management practices, shrubs and vines have become much more prevalent, including yaupon, American beautyberry (*Callicarpa american*), Virginia creeper (*Parthenocissus quinquefolia*), and greenbriar (*Smilax* spp.). A large proportion of the historic distribution of this BpS has been lost due to harvesting to create pastures for livestock grazing and/or to make room for homes, development, etc.

Due to the extreme drought conditions, tree stands are dying or are extremely stressed. This increased the amount of standing dead trees and an increase in insect activities. The increase of standing dead has been opening up the understory to more shrub density and an increase of ground litter and fuel.

Comments

This model was created for MZ32 and MZ35 by Jeff Sparks.

Climate change in this area will be an increase in severe rain storms. If the tree component cannot recover the canopy cover, then there will be an increase in erosion and invasive plant species will continue to increase. Succession classes may be altered due to the change in physical land conditions as well as changes in vegetation cover and type.

Suggested reviewers for this type in MZ32 and MZ35 include Greg Creacy (Texas Parks and Wildlife), Rich Gray (Texas Forest Service), and David Riskind (Texas Parks and Wildlife).

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 | C | C | C | B | B | B |
| Tree | 10-25 | C | C | C | C | C | C | C | B | B | B |
| Tree | 25-50 | D | D | D | D | D | D | D | E | E | E |
| Tree | >50 | D | D | D | D | D | D | D | 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 12 Early Development 1 - All Structures

Indicator Species

|  |  |  |  |
| --- | --- | --- | --- |
| **Symbol** | **Scientific Name** | **Common Name** | **Canopy Position** |
| PITA | Pinus taeda | Loblolly pine | All |
| QUERC | Quercus | Oak | All |
| ILVO | Ilex vomitoria | Yaupon | Middle |
| CAAM2 | Callicarpa americana | American beautyberry | Low-Mid |

Description

Pine/oak regeneration with grass/forb regrowth. *P. taeda*, *Quercus* spp., mixed hardwood shrubs, yaupon, blackberry (*Rubus* spp.), various *Andropogon* spp., indiangrass (*Sorghastrum nutans*), little bluestem, *Carex* spp., and forbs with weedy component.

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

Class B 5 Mid Development 1 - Closed

Indicator Species

|  |  |  |  |
| --- | --- | --- | --- |
| **Symbol** | **Scientific Name** | **Common Name** | **Canopy Position** |
| PITA | Pinus taeda | Loblolly pine | All |
| QUERC | Quercus | Oak | All |
| ILVO | Ilex vomitoria | Yaupon | Middle |

Description

Mid-development class dominated by *P. taeda* and mixed hardwood trees (primarily oaks) and shrubs dominated by yaupon. Dense overstory and midstory. Sparse understory with little to no herbaceous component.

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

Class C 7 Mid Development 1 - Open

Indicator Species

|  |  |  |  |
| --- | --- | --- | --- |
| **Symbol** | **Scientific Name** | **Common Name** | **Canopy Position** |
| PITA | Pinus taeda | Loblolly pine | Upper |
| QUERC | Quercus | Oak | Upper |
| ILVO | Ilex vomitoria | Yaupon | Low-Mid |
| ANDRO2 | Andropogon | Bluestem | Lower |

Description

Open mid-development class. Open canopy dominated by *P. taeda* and fire-tolerant oak species, primarily *Q. stellata*, *Q. marilandica*, and *Q. margarettiae*. Open overstory, limited midstory, and a low-stature shrub story. Fairly continuous herbaceous component in sites with open canopy, with a decrease in herbaceous component as the canopy cover increases.

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

Class D 54 Late Development 1 - Open

Indicator Species

|  |  |  |  |
| --- | --- | --- | --- |
| **Symbol** | **Scientific Name** | **Common Name** | **Canopy Position** |
| PITA | Pinus taeda | Loblolly pine | Upper |
| QUERC | Quercus | Oak | Upper |
| ILVO | Ilex vomitoria | Yaupon | Low-Mid |
| ANDRO2 | Andropogon | Bluestem | Lower |

Description

Mature open canopy, mixed pine/hardwood woodland to savanna. Depending on soil properties, pine or oak may be dominant canopy species. Very limited midstory (mixed hardwoods, limited to moderate pine regeneration). Low stature, open shrub layer (primarily *I. vomitoria* and *C. americana*). Well-developed herbaceous understory governed by percent canopy closure. Made up of diverse grass and forb species.

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

Class E 22 Late Development 1 - Closed

Indicator Species

|  |  |  |  |
| --- | --- | --- | --- |
| **Symbol** | **Scientific Name** | **Common Name** | **Canopy Position** |
| PITA | Pinus taeda | Loblolly pine | Upper |
| QUERC | Quercus | Oak | Upper |
| ILVO | Ilex vomitoria | Yaupon | Middle |

Description

Mature closed-canopy loblolly pine/mixed hardwood forest. Dense midstory (mixed hardwoods, *I. vomitoria*, with little pine regeneration). Moderate to dense shrub layer, primarily *I. vomitoria* and *C. americana*. Sparse shade-tolerant herbaceous understory (primarily *Carex* spp.).

*Maximum Tree Size Class*  
Large 21-33" 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 | 40 |
| Mid1:CLS | 16 | Late1:CLS | 40 |
| Late1:OPN | 41 | Late1:OPN | 999 |
| Late1:CLS | 41 | 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 | 0.1 | 10 | Yes | 0 |
| Surface Fire | Early1:ALL | Early1:ALL | 0.15 | 7 | No | 0 |
| Alternative Succession | Mid1:OPN | Mid1:CLS | 1 | 1 | Yes | 10 |
| Surface Fire | Mid1:OPN | Mid1:OPN | 0.15 | 7 | No | 0 |
| Replacement Fire | Mid1:CLS | Early1:ALL | 0.03 | 33 | Yes | 0 |
| Mixed Fire | Mid1:CLS | Mid1:OPN | 0.04 | 25 | Yes | 0 |
| Surface Fire | Mid1:CLS | Mid1:CLS | 0.1 | 10 | No | 0 |
| Alternative Succession | Late1:OPN | Late1:CLS | 1 | 1 | Yes | 14 |
| Surface Fire | Late1:OPN | Late1:OPN | 0.15 | 7 | No | 0 |
| Replacement Fire | Late1:CLS | Early1:ALL | 0.01 | 100 | Yes | 0 |
| Mixed Fire | Late1:CLS | Late1:OPN | 0.04 | 25 | Yes | 0 |
| Surface Fire | Late1:CLS | Late1:CLS | 0.1 | 10 | No | 0 |

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

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Summary of Representative Plant Communities.