

13580

East-Central Texas Plains Southern Pine Forest and Woodland

BpS Model/Description Version: Aug. 2020

Modelers		Reviewers	
Jeff Sparks	jeff.sparks@tpwd.state.tx.us	David Riskind	david.riskind@tpwd.state.tx.us
None	None	Eric Keith	None
None	None	Bruce Hoagland	None

Reviewer: Tim Christiansen, timothy.a.christiansen.nfg@mail.mil

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	<i>Pinus taeda</i>	Loblolly pine
QUST	<i>Quercus stellata</i>	Post oak
QUMA3	<i>Quercus marilandica</i>	Blackjack oak
CATE9	<i>Carya texana</i>	Black hickory

SCHIZ4	<i>Schizachyrium</i>	Little bluestem
ANGE	<i>Andropogon gerardii</i>	Big bluestem
SPJU	<i>Sporobolus junceus</i>	Pineywoods dropseed
QUMA6	<i>Quercus margarettiae</i>	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
--------	-----------------	-------------	-----------------

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

References

Creacy, G. Personal communication.

Keith, E. 2002. Summary of Plant Communities for the Stewart and Hinkley Tracts in Bastrop State Park. Report for Texas Parks and Wildlife Department. 23 pp.

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

Texas Parks and Wildlife Natural Resource Program. August 1990. Bastrop State Park, Summary of Representative Plant Communities.