

13710

West Gulf Coastal Plain Pine-Hardwood Forest

BpS Model/Description Version: Aug. 2020

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Vegetation Type

Forest and Woodland

Map Zones

44

Model Splits or Lumps

This BpS is lumped with 1405

Geographic Range

This Biophysical Setting (BpS) lies in Arkansas, Louisiana, Texas, and southeast Oklahoma. The West Gulf Coastal Plain Pine-Hardwood Forest type is found over a large area of the South-Central model zone. It is the predominant vegetation system over most of the Upper West Gulf Coastal Plain ecoregion with smaller incursions into the southern Interior Highlands. Ecological Classification CES203.378. Includes ECOMAP section 231E and subsections 231Eo, 231Eb, 231Ec, 231Ee and 231Ek.

Biophysical Site Description

This BpS was historically present on nearly all uplands in the region except on the most edaphically limited sites (droughty sands, calcareous clays, and shallow soil barrens/rock outcrops). Such sites are underlain by loamy to fine-textured soils of variable depths. These are upland sites on low ridgetops and adjacent side slopes, with moderate-to-high fertility and moisture retention. (Ecological Classification CES203.378).

Vegetation Description

This BpS consists of forests and woodlands dominated by shortleaf pine (*P. echinata*) and/or loblolly pine (*P. taeda*) in combination with a host of dry to dry-mesic site hardwood species at lesser prevalence (e.g., oak, [*Quercus* spp.]), sweetgum (*Liquidambar styraciflua*), hickory (*Carya* spp.). This system has undergone major transformations since European settlement of the region.

BpS Dominant and Indicator Species

Symbol	Scientific Name	Common Name
PITA	<i>Pinus taeda</i>	Loblolly pine
PIEC2	<i>Pinus echinata</i>	Shortleaf pine
QUERC	<i>Quercus</i>	Oak
ANDRO 2	<i>Andropogon</i>	Bluestem

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

Disturbance Description

This BpS is fire regime group 1. Naturally, this system had frequent fire dominated by low intensity surface fire with occasional mixed fire in drought years and rare stand replacement fires in extreme dry years. Drought and moisture cycles play a strong role interacting with both fire frequency and intensity. Other disturbance factors that played a role included ice storms, wind events, and insect infestations.

Fire Frequency

Severity	Avg FI	Percent of All Fires	Min FI	Max FI
Replacement	120	4		
Moderate (Mixed)	52	9		
Low (Surface)	5	87		
All Fires	4	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

Historically this BpS covered a very large and relatively contiguous area broken by smaller areas of pine flatwoods, bottomland sloughs and swamps, blackland prairies, saline barrens and river systems (e.g., Red River, Little River, Ouachita River and Saline River floodplain).

Adjacency or Identification Concerns

The BpS meets the pine and oak-hickory types along the southwestern edge of the Interior Highlands ecoregion, and there may be some integration of this type into the lower areas of the Ouachita Mountains. Along the eastern border, the BpS also integrates with the bottomland hardwood systems of the Mississippi River Alluvial Plain ecoregion, map zone (MZ)45.

Issues or Problems

Native Uncharacteristic Conditions

Large areas of this type have been converted to pure loblolly pine plantations and/or have been harvested or eliminated for improved pastures, and/or to make room for homes, development, etc.

Comments

For MZ44 BpS 1405--West Gulf Coastal Plain Nepheline Syenite Glade is lumped with BpS 1371 because 1405 is too fine for mapping and its disturbance regime is dependent on the surrounding pine-hardwood forest.

This model was developed for MZ44 using the MZ37 model for the same BpS as a starting point. Significant changes to the MZ37 model resulted in the change in modelership.

Succession Classes

Mapping Rules

		Canopy Cover (%)
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Upper Layer Lifeform	Height (m)	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 9 Early Development 1 - All Structures

Indicator Species

Symbol	Scientific Name	Common Name	Canopy Position
PIEC2	<i>Pinus echinata</i>	Shortleaf pine	Upper
PITA	<i>Pinus taeda</i>	Loblolly pine	Upper
QUERC	<i>Quercus</i>	Oak	Middle
ANDRO2	<i>Andropogon</i>	Bluestem	Lower

Description

Pine/oak regeneration with grass/forb regrowth. *P. taeda*, *P. echinata*, *Quercus* spp., mixed hardwood shrubs, blackberry (*Rubus* spp.), various bluestems (*Andropogon* spp.), sedges (*Carex* spp.) and forbs with weedy (i.e. early successional annual) component. Frequent surface fires, mixed fire and occasional replacement fires are the disturbance factors that maintain this class.

Maximum Tree Size Class

Sapling >4.5ft; <5"DBH

Class B 10 Mid Development 1 - Closed

Indicator Species

Symbol	Scientific Name	Common Name	Canopy Position
PIEC2	<i>Pinus echinata</i>	Shortleaf pine	Upper
PITA	<i>Pinus taeda</i>	Loblolly pine	Upper

QUERC	Quercus	Oak	Middle
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Description

Mid-development class dominated by pines and mixed hardwood trees and shrubs. Dense overstory and midstory. Sparse understory with little to no herbaceous component. Frequent surface fires maintain the class.

Maximum Tree Size Class

Pole 5-9" DBH

Class C	23	Mid Development 1 - Open
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Indicator Species

Symbol	Scientific Name	Common Name	Canopy Position
PIEC2	Pinus echinata	Shortleaf pine	Upper
PITA	Pinus taeda	Loblolly pine	Upper
QUERC	Quercus	Oak	Mid-Upper
ANDRO2	Andropogon	Bluestem	Lower

Description

Open mid-development class. Open canopy dominated by pines and fire-tolerant oak species. Open overstory and limited midstory. Continuous herbaceous component.

Maximum Tree Size Class

Pole 5-9" DBH

Class D	54	Late Development 1 - Open
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Indicator Species

Symbol	Scientific Name	Common Name	Canopy Position
PIEC2	Pinus echinata	Shortleaf pine	Upper
PITA	Pinus taeda	Loblolly pine	Upper
QUERC	Quercus	Oak	Upper
ANDRO2	Andropogon	Bluestem	Lower

Description

Mature open canopy mixed pine/mixed hardwood woodland to savanna. Depending on soil properties, pine or oak may be dominant canopy species. Very limited midstory (mixed hardwoods, little pine regeneration). Well-developed herbaceous understory governed by percent canopy closure. Made up of diverse grass and forb species.

Maximum Tree Size Class

Medium 9-21"DBH

Class E	4	Late Development 1 - Closed
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Indicator Species

Symbol	Scientific Name	Common Name	Canopy Position
PITA	Pinus taeda	Loblolly pine	Upper
PIEC2	Pinus echinata	Shortleaf pine	Upper
QUAL	Quercus alba	White oak	Middle
CORNU	Cornus	Dogwood	Lower

Description

Mature closed canopy pine/mixed hardwood forest. Dense midstory (mixed hardwoods). Sparse shade-tolerant herbaceous understory.

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	14
Mid1:OPN	15	Late1:OPN	40
Mid1:CLS	15	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	0.02	50	Yes	0
Mixed Fire	Early1:ALL	Early1:ALL	0.04	25	No	0
Surface Fire	Early1:ALL	Early1:ALL	0.2	5	No	0
Alternative Succession	Mid1:OPN	Mid1:CLS	1	1	Yes	10
Replacement Fire	Mid1:OPN	Early1:ALL	0.01	100	Yes	0
Surface Fire	Mid1:OPN	Mid1:OPN	0.2	5	No	0
Wind or Weather or Stress	Mid1:CLS	Mid1:OPN	0.004	250	Yes	0
Replacement Fire	Mid1:CLS	Early1:ALL	0.01	100	Yes	0
Insects or Disease	Mid1:CLS	Mid1:OPN	0.02	50	Yes	0
Mixed Fire	Mid1:CLS	Mid1:OPN	0.04	25	Yes	0
Surface Fire	Mid1:CLS	Mid1:CLS	0.2	5	No	0
Alternative Succession	Late1:OPN	Late1:CLS	1	1	Yes	20

Insects or Disease	Late1:OPN	Mid1:OPN	0.005	200	Yes	0
Replacement Fire	Late1:OPN	Early1:ALL	0.005	200	Yes	0
Mixed Fire	Late1:OPN	Late1:OPN	0.02	50	No	0
Surface Fire	Late1:OPN	Late1:OPN	0.2	5	No	0
Insects or Disease	Late1:CLS	Early1:ALL	0.005	200	Yes	0
Wind or Weather or Stress	Late1:CLS	Early1:ALL	0.007	143	Yes	0
Replacement Fire	Late1:CLS	Early1:ALL	0.01	100	Yes	0
Insects or Disease	Late1:CLS	Late1:OPN	0.015	67	Yes	0
Mixed Fire	Late1:CLS	Late1:OPN	0.02	50	Yes	0
Surface Fire	Late1:CLS	Late1:CLS	0.2	5	No	0

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