13510
Southeastern Interior Longleaf Pine Woodland

BpS Model/Description Version: Aug. 2020

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Modelers		Reviewers	
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Vegetation Type
Forest and Woodland

Map Zones
48, 54, 59

Geographic Range
This system once ranged along ridge areas on the eastern portion of this map zone (MZ). This longleaf pine-dominated system occupied mountainous, dissected, mostly mesic uplands in northeast Alabama and northwest Georgia, and the Lookout Mountain areas of Tennessee.

It has been greatly reduced in its extent by fire suppression, resulting in oak encroachment.

Biophysical Site Description
This forest type occurs in upland settings, which in this zone is mostly rugged and mountainous. Geologic substrates are dominated by gravely soils in this biophysical area. Primary influence on this site is fire. Remnants are now largely limited, clustered in eastern Alabama, western Georgia, and southeastern Tennessee.

Vegetation Description
These forest areas were dominated by open canopied stands of longleaf pine (*Pinus palustris*), sometimes with a minority component of shortleaf (*Pinus echinata*) and scattered oaks, including *Quercus prinus, Q. falcata, Q. marilandica, Q. laevis*, and *Q. stellata* (Peet 2006).

Shrub, grass, and hardwood cover was kept in check by frequent fire, although hardwoods were more prevalent on the more productive sites.

Alteration of fire regimes and universal logging have made the natural condition of the vegetation somewhat uncertain (NatureServe 2007).

Almost certainly *Pinus palustris* was more abundant than it usually is at present, but very likely some component of other pines and of oaks was present. Under conditions of frequent fire, understories and shrub layers were sparse and the grassy herb layer dense. In remnant examples where fire suppression has affected vegetation structure, the ground cover is often shrubby, with dense ericaceous shrubs leaving little space for herbs. Examples that have been burned recently often have ground cover dominated by shrubs and hardwood sprouts, with somewhat increased herb cover (NatureServe 2007).

BpS Dominant and Indicator Species

Symbol	Scientific Name	Common Name
PIPA2	*Pinus palustris*	Longleaf pine
QUST	*Quercus stellata*	Post oak
QUMA3	*Quercus marilandica*	Blackjack oak
QUPR2	*Quercus prinus*	Chestnut oak
QULA2	*Quercus laevis*	Turkey oak
PIVI2	*Pinus virginiana*	Virginia pine
PIEC2	*Pinus echinata*	Shortleaf pine
CADE12	*Castanea dentata*	American chestnut

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

Disturbance Description

The dynamics of this system are strongly dominated by fire. Fires probably once occurred at frequencies somewhat lower than in the Coastal Plain or Piedmont (NatureServe 2007). In longleaf pine mesic uplands, canopy gaps are created by fire mortality, lightning, and wind throw at the scale of individual trees or several trees. Frequent surface fires, every 1-5yrs, on average every 3yrs (Klaus 2005), generally burn the understory vegetation in patches; fires have little effect on fire-tolerant trees. Most fires are lightning caused, with little Native American influence. Fires are usually low in intensity overall but may occasionally kill young regeneration. Fires rarely kill individual older trees. Individual fires cover extensive areas.

Replacement events are generally caused by wind or ice creating local patches of mortality. Canopies are believed to be many-aged, consisting of a fine mosaic of small, even-aged groves driven by gap-phase regeneration.

Modern fire suppression has allowed other pines and oaks to increase in density, along with shrubs, and has resulted in the loss of the herb layer. Reproduction of *Pinus palustris* has been largely eliminated by the lack of fire. Where the canopy was also logged, *Pinus palustris* has often been eliminated, leaving the system indistinguishable from logged Central -South Appalachian Montane Oak Forest (biophysical setting [BpS] 1320) (NatureServe 2007).

Fire Frequency

Severity	Avg FI	Percent of All Fires	Min FI	Max FI
Replacement	548	1	500	1000
Moderate (Mixed)	297	1		
Low (Surface)	3	98	1	5
All Fires	3	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

Patch size and the scale of disturbance for this system can range from single trees to 100ac. As noted, mortality from ice, fire, and wind was patchy. Occurrences often form mosaics with the Central South Appalachian Montane Oak Forest Type (BpS 1320). On north facing areas this forest type blends down into the South Central Interior Mesophytic Forest (BpS 1321).

Adjacency or Identification Concerns

NatureServe (2007) notes this system is closely related to the upland longleaf pine systems of the Piedmont, with which it shares the ecological importance of fire, much of its flora and presumably fauna, and probably canopy dynamics. It is distinguished by the distinctive Talladega upland landscape with its greater topographic relief. This system is distinguished from all other interior systems in having *Pinus palustris*, an indicator of frequent fire, as a dominant species.

Issues or Problems
The unifying factors are the occurrence of longleaf pine and fire dependent hardwoods. American Chestnut was historically a component of this forest type.

Universal logging and fire suppression have blurred its distinction, although this system should be recognized where there remains evidence of its past occurrence in the form of remnant flora (NatureServe 2007).

Native Uncharacteristic Conditions
Much of this forest type has been fire suppressed and converted upland pine oak or mountain dry oak. Some of this forest type have been subject to conversion to development, mostly single residences on lookout sites on the ridgetops, especially on the Lookout Mountain area of Tennessee and northeast Alabama.

Comments
Models for MZs48, 54, and 59 were identified as identical in the BpS review process. The descriptions for MZs 54 and 59 were identical except for editorial comments. The description from MZ48 appeared to be more complete, so it was used to represent this BpS in MZs 48, 54, and 59.

Suggested Reviewers include: Bill Pickens (bill.picken@ncmail.net) - NCDFR Pine Specialist; Johnny Stowe - SCDNR; John McGuire - Longleaf Alliance; Nathan Klaus - Georgia DNR

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 con	C con	C con	C con	C con	C con	C con	C con	C con	C con
Tree	5-10	B brdlf	B brdlf	B brdlf	B brdlf	B brdlf	B brdlf	B brdlf	B brdlf	B brdlf	B brdlf
Tree	5-10	B mix	B mix	B mix	B mix	B mix	B mix	B mix	B mix	B mix	B mix

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	D con	D con	D con	D con	D con	D con	D con	D con	D con	D con
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	E brdlf	E brdlf	E brdlf	E brdlf	E brdlf	E brdlf	E brdlf	E brdlf	E brdlf	E brdlf
Tree	>50	D con	D con	D con	D con	D con	D con	D con	D con	D con	D con
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

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 **8** **Early Development 1 - All Structures**

Indicator Species

Symbol	Scientific Name	Common Name	Canopy Position
PIPA2	Pinus palustris	Longleaf pine	Lower
QUERC	Quercus	Oak	Lower
SCSC	Schizachyrium scoparium	Little bluestem	Lower

Description

Class A is a post-replacement condition, with canopy gaps, ranging from a single tree up to 100ac size after large-scale wind or ice events. The understory is dominated by native grasses with numerous forbs. Tree cover ranges from 0-30%.

Maximum Tree Size Class

Sapling >4.5ft; <5"DBH

Class B **1** **Mid Development 1 - Closed**

Indicator Species

Symbol	Scientific Name	Common Name	Canopy Position
PIPA2	Pinus palustris	Longleaf pine	Middle
QUERC	Quercus	Oak	Middle
KALA	Kalmia latifolia	Mountain laurel	Lower

Description

Class B is characterized as a mid-seral closed condition with patches, mostly one-quarter acres or less in size, of middle aged canopy pines. There is a substantial component of hardwoods or

other pine species encroaching in the absence of fire. The hardwood/encroaching pine cover is >50%. The canopy pine cover ranges from 15-75%.

Maximum Tree Size Class
Medium 9-21"DBH

Class C **26** **Mid Development 1 - Open**

Indicator Species

Symbol	Scientific Name	Common Name	Canopy Position
PIPA2	Pinus palustris	Longleaf pine	Middle
SCSC	Schizachyrium scoparium	Little bluestem	Lower

Description
Class C is characterized as mid-seral open middle-aged canopy pines old within patches, mostly one-quarter acre or less in size, or in larger groves from weather origins. There is a minimal hardwood component, <5%, due to frequent fire. The ground cover is dominated by grass. The canopy pine cover ranges from 31-75%.

Overstory characteristics cannot be used to identify this class. The difference between this and class B is the amount of hardwood midstory being <10% here and 10% or greater in class B.

Maximum Tree Size Class
Medium 9-21"DBH

Class D **63** **Late Development 1 - Open**

Indicator Species

Symbol	Scientific Name	Common Name	Canopy Position
PIPA2	Pinus palustris	Longleaf pine	Upper
SCSC	Schizachyrium scoparium	Little bluestem	Lower

Description
Class D is a late seral open condition with patches, mostly one-quarter acre or less in size, of older canopy pines. There is a minimal component of hardwoods. The ground cover is dominated by grass.

Maximum Tree Size Class
Large 21-33"DBH

Class E **2** **Late Development 1 - Closed**

Indicator Species

Symbol	Scientific Name	Common Name	Canopy Position
PIPA2	Pinus palustris	Longleaf pine	Upper

QUERC	Quercus	Oak	All
KALA	Kalmia latifolia	Mountain laurel	Lower

Description
Class E is characterized as a late seral closed condition with patches of canopy pines more than 50yrs old. There is a substantial component of hardwoods, i.e. >40%, and often pines other than longleaf in either the overstory or midstory. The ground cover is shrubby or sparse. The encroaching hardwood/pine cover is >50%.

Differentiation from class D is based on hardwood component >40% in the overstory.

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	50
Mid1:CLS	16	Late1:CLS	50
Late1:OPN	51	Late1:OPN	999
Late1:CLS	51	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	12
Replacement Fire	Early1:ALL	Early1:ALL	0.01	100	Yes	0
Surface Fire	Early1:ALL	Early1:ALL	0.33	3	No	0
Alternative Succession	Mid1:OPN	Mid1:CLS	1	1	Yes	20
Replacement Fire	Mid1:OPN	Early1:ALL	0.001	1000	Yes	0
Wind or Weather or Stress	Mid1:OPN	Early1:ALL	0.004	250	Yes	0
Surface Fire	Mid1:OPN	Mid1:OPN	0.33	3	No	0
Replacement Fire	Mid1:CLS	Early1:ALL	0.002	500	Yes	0
Wind or Weather or Stress	Mid1:CLS	Early1:ALL	0.004	250	Yes	0
Mixed Fire	Mid1:CLS	Mid1:OPN	0.01	100	Yes	0
Wind or Weather or Stress	Mid1:CLS	Mid1:OPN	0.02	50	Yes	0
Surface Fire	Mid1:CLS	Mid1:CLS	0.1	10	No	0

Alternative Succession	Late1:OPN	Late1:CLS	1	1	Yes	20
Replacement Fire	Late1:OPN	Early1:ALL	0.001	1000	Yes	0
Mixed Fire	Late1:OPN	Mid1:OPN	0.005	200	Yes	0
Wind or Weather or Stress	Late1:OPN	Early1:ALL	0.005	200	Yes	0
Surface Fire	Late1:OPN	Late1:OPN	0.33	3	No	0
Replacement Fire	Late1:CLS	Early1:ALL	0.002	500	Yes	0
Wind or Weather or Stress	Late1:CLS	Early1:ALL	0.004	250	Yes	0
Mixed Fire	Late1:CLS	Late1:OPN	0.007	143	Yes	0
Surface Fire	Late1:CLS	Late1:CLS	0.1	10	No	0

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