

13070

East Gulf Coastal Plain Northern Dry Upland Hardwood Forest

BpS Model/Description Version: Aug. 2020

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Modelers		Reviewers	
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None	None	None	None
None	None	None	None

Vegetation Type

Forest and Woodland

Map Zones

46, 47, 48

Geographic Range

This system is found in the Coastal Plain of western Kentucky and Tennessee, ranging south to northern Mississippi and Alabama. The core range of this type lies within the Northern Hilly Coastal Plain (Level IV Ecoregion 65e) of Omernik (EPA 2004), including map zone (MZ) 47 subsections 231Hb and 231Hd. These areas occupy the eastern margin of the upper Coastal Plain where elevation is greatest and influence of loess is less than adjacent areas to the west.

Biophysical Site Description

This Biophysical Setting (BpS) occurs on upper slopes and drier rolling uplands of the upper (and less frequently lower) coastal plain that are somewhat fire sheltered. Soils are typically acidic, well drained, and of varying textures. Some rare examples may occur on more base-rich sites. Elevations generally range from 10-300ft amsl. Soils are loamy to clayey and well-drained but not excessively drained.

Vegetation Description

Vegetation consists of forests dominated by combinations of upland oaks, particularly *Quercus alba* (white oak), *Quercus falcata* (southern red oak), *Quercus stellata* (post oak), *Quercus pagoda* (cherrybark oak), and other hardwood species. Hickories (e.g., *Carya alba* [mockernut hickory], *Carya glabra* [pignut hickory], and/or *Carya pallida* [sand hickory]) may be present. There is some variation in composition with aspect and degree of exposure to fire. NatureServe (2006) notes that the vegetation of this system has received almost no specific study and is extremely poorly documented.

This system is generally north of the ranges of *Pinus echinata* (shortleaf pine) and *Pinus taeda* (loblolly pine). A well-developed shrub layer may be present, with *Vaccinium* spp. and *Gaylussacia* spp. most typical. The herb layer is generally sparse, at least with longer fire return times. Species richness also tends to be low. In examples where fires have occurred, the understory would be open and savanna-like, and dominated by grasses and forbs rather than shrubs (NatureServe 2006).

BpS Dominant and Indicator Species

Symbol	Scientific Name	Common Name
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QUAL	<i>Quercus alba</i>	White oak
QUST	<i>Quercus stellata</i>	Post oak
CAGL8	<i>Carya glabra</i>	Pignut hickory
QUFA	<i>Quercus falcata</i>	Southern red oak
JUVIV	<i>Juniperus virginiana</i> var. <i>virginiana</i>	Eastern redcedar
CAAL27	<i>Carya alba</i>	Mockernut hickory
QUPA5	<i>Quercus pagoda</i>	Cherrybark oak
CAOV2	<i>Carya ovata</i>	Shagbark hickory

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

Disturbance Description

Frequent surface fires occurred on a 5-10yr return interval. These frequent light surface fires maintained the grassy understory of the oak woodlands.

Fire Frequency

Severity	Avg FI	Percent of All Fires	Min FI	Max FI
Replacement	392	2		
Moderate (Mixed)	91	9		
Low (Surface)	9	89		
All Fires	8	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

This is a matrix system, and covered large extents of the landscape of the rolling upper East Gulf Coastal Plain (NatureServe 2006).

Adjacency or Identification Concerns

Issues or Problems

To the west this system grades into the East Gulf Coastal Plain Northern Loess Plain Oak-Hickory Upland (CES203.482 or BpS 1306). These two types (BpS 1306 and 1307) are similar and may be difficult to distinguish where they come together. The loess plain type (BpS 1306) is believed to be more mesic and richer floristically due to the influence of the loessal soils. However, it is also rare due to the fertility of the soils for agriculture. More work is needed to better quantify the differences between these types and their exact boundaries.

Native Uncharacteristic Conditions

Many of the currently existing stands are much denser than in presettlement times, with more mid-story hardwoods, including mesic hardwoods like red maple (*Acer rubrum*), sweetgum (*Liquidambar styraciflua*), and an understory dominated by woody shrubs and tree seedlings resulting from reduced frequency of surface fires.

Comments

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	D	D	D	D	D	D	D	E	E	E
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 6 Early Development 1 - All Structures

Indicator Species

Symbol	Scientific Name	Common Name	Canopy Position
QUAL	Quercus alba	White oak	Upper
QUFA	Quercus falcata	Southern red oak	Upper
LIST2	Liquidambar styraciflua	Sweetgum	Upper
JUVIV	Juniperus virginiana var. virginiana	Eastern redcedar	Upper

Description

Class A is characterized by oak reproduction (up to sapling size) in gaps. It is typically primarily oaks and other hardwoods (including fire-intolerant taxa). The range of this type is generally north of the distribution of Shortleaf and Loblolly pines, but Eastern red-cedar may be present in some early successional stands after disturbance.

Maximum Tree Size Class

Sapling >4.5ft; <5"DBH

Class B 16 Mid Development 1 - Closed

Indicator Species

Symbol	Scientific Name	Common Name	Canopy Position
QUAL	Quercus alba	White oak	Upper

QUFA	<i>Quercus falcata</i>	Southern red oak	Upper
CAAL27	<i>Carya alba</i>	Mockernut hickory	Mid-Upper
LIST2	<i>Liquidambar styraciflua</i>	Sweetgum	Mid-Upper

Description

Class B has a closed canopy dominated by oaks and hardwoods, with a mid-story of hardwoods (including fire-intolerant taxa) resulting from fire exclusion. Understory herbaceous growth is reduced due to substantial shading from the over- and mid-story layers.

Maximum Tree Size Class

Medium 9-21"DBH

Class C	27	Mid Development 1 - Open
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Indicator Species

Symbol	Scientific Name	Common Name	Canopy Position
QUAL	Quercus alba	White oak	Upper
CAGL8	Carya glabra	Pignut hickory	Mid-Upper
QUST	Quercus stellata	Post oak	Mid-Upper
CAAL27	Carya alba	Mockernut hickory	Mid-Upper

Description

Class C is an open-canopy forest or woodland of oaks (primarily more fire-tolerant ones) with a grass and forb dominated understory. The overstory trees in class C generally range from 15-59yrs of age.

Maximum Tree Size Class

Medium 9-21"DBH

Class D	34	Late Development 1 - Open
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Indicator Species

Symbol	Scientific Name	Common Name	Canopy Position
QUAL	Quercus alba	White oak	Upper
CAGL8	Carya glabra	Pignut hickory	Mid-Upper
QUST	Quercus stellata	Post oak	Mid-Upper
CAAL27	Carya alba	Mockernut hickory	Mid-Upper

Description

Class D is an open-canopy forest or woodland with large oaks (primarily more fire-tolerant ones) and an herbaceous-dominated understory with a mixture of grasses and forbs. The overstory is generally >60yrs old.

Maximum Tree Size Class

Large 21-33"DBH

Class E**17****Late Development 1 - Closed**Indicator Species

Symbol	Scientific Name	Common Name	Canopy Position
QUAL	Quercus alba	White oak	Upper
QUFA	Quercus falcata	Southern red oak	Upper
CAAL27	Carya alba	Mockernut hickory	Low-Mid
COFL2	Cornus florida	Flowering dogwood	Low-Mid

Description

Class E is a closed-canopy forest with large oaks (including less fire-tolerant ones), a mid-story of fire-intolerant hardwoods, and a sparse understory dominated by shrubs and tree seedlings. The canopy in class E is generally greater than 60yrs old.

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	14
Mid1:OPN	15	Late1:OPN	59
Mid1:CLS	15	Late1:CLS	59
Late1:OPN	60	Late1:OPN	999
Late1:CLS	60	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	13
Replacement Fire	Early1:ALL	Early1:ALL	0.008	125	Yes	0
Surface Fire	Early1:ALL	Early1:ALL	0.14	7	No	0
Alternative Succession	Mid1:OPN	Mid1:CLS	1	1	Yes	12
Wind or Weather or Stress	Mid1:OPN	Early1:ALL	0.002	500	Yes	0
Replacement Fire	Mid1:OPN	Early1:ALL	0.003	333	Yes	0
Surface Fire	Mid1:OPN	Mid1:OPN	0.15	7	No	0

Wind or Weather or Stress	Mid1:CLS	Early1:ALL	0.002	500	Yes	0
Replacement Fire	Mid1:CLS	Early1:ALL	0.003	333	Yes	0
Mixed Fire	Mid1:CLS	Mid1:OPN	0.05	20	Yes	0
Surface Fire	Mid1:CLS	Mid1:CLS	0.05	20	No	0
Alternative Succession	Late1:OPN	Late1:CLS	1	1	Yes	15
Replacement Fire	Late1:OPN	Early1:ALL	0.001	1000	Yes	0
Insects or Disease	Late1:OPN	Early1:ALL	0.001	1000	Yes	0
Wind or Weather or Stress	Late1:OPN	Early1:ALL	0.003	333	Yes	0
Surface Fire	Late1:OPN	Late1:OPN	0.15	7	No	0
Wind or Weather or Stress	Late1:CLS	Early1:ALL	0.002	500	Yes	0
Replacement Fire	Late1:CLS	Early1:ALL	0.003	333	Yes	0
Insects or Disease	Late1:CLS	Early1:ALL	0.003	333	Yes	0
Wind or Weather or Stress	Late1:CLS	Late1:OPN	0.02	50	Yes	0
Mixed Fire	Late1:CLS	Late1:OPN	0.02	50	Yes	0
Surface Fire	Late1:CLS	Late1:CLS	0.05	20	No	0

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