13260
South-Central Interior/Upper Coastal Plain Flatwoods

BpS Model/Description Version: Aug. 2020

Modelers		Reviewers	
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None	None	None	None
None	None	None	None

Vegetation Type
Forest and Woodland

Map Zones
47

Geographic Range
This system occurs in limited areas of the most inland portions of the East Gulf Coastal Plain in western KY and adjacent TN (the "Jackson Purchase" or "Jackson Plain" region; 222Cb; 74b in part), as well as in the nearby "Shawnee Hills" of the Interior Low Plateau (222Dh, 222Di; 72c) of KY and adjacent IN (NatureServe 2006).

Biophysical Site Description
Examples of this system occur along the northeastern flank of the Upper East Gulf Coastal Plain ecoregion where loess deposits thin out and gravelly or sandy soils predominate. Examples occur on relatively high flat areas (upland plains, flat ridgetops, and floodplain terraces) that are not directly affected by overbank flooding. These environments include ancient Quaternary or Tertiary post-glacial meltwater lakebeds and high terraces of the Upper Gulf Coastal Plain. The most typical soil is Okaw Silt Loam. The same system is found in the Shawnee Hills of KY (M. Evans pers. comm. 2006). The lakes were originally formed by glacial damming of the Ohio River.

This system represents hardwood-dominated "xerohydric flatwoods" of limited areas of the most inland portions of the East Gulf Coastal Plain in western KY, as well as in the nearby Shawnee Hills in the western Interior Low Plateau. The core of the area from which this system was initially described is referred to as the Jackson Purchase or "Jackson Plain," where these areas have long been recognized as a distinctive subdivision within this region (Davis 1923, Bryant and Martin 1988). There is some local variability in the expression of this system along a hydrologic/microtopographic gradient. The elevated ridges are composed of somewhat coarser-textured soils and retain less moisture than do the lower areas, although both occur in a tight local mosaic. Soils are usually deep, but appear to have well-developed subsurface hardpans, the impermeability of which contributes to shallowly perched water tables during portions of the year when precipitation is greatest and evapotranspiration is lowest (not due to overbank flooding). Thus, soil moisture fluctuates widely throughout the growing season, from saturated to very dry, a condition sometimes referred to as xerohydric (Evans 1991).

Vegetation Description

Stands of this system are dominated by Quercus stellata, a somewhat fire-tolerant oak. In addition, Quercus alba, Carya ovata, Carya glabra, and Quercus velutina may be present. The presence of Quercus falcata indicates longer fire-return times. The presence of Quercus imbricaria indicates that stands were formerly more open. Pinus spp. are not prevalent in this area, but could invade from nearby plantations. Herbaceous cover is sparse to moderate; leaf litter is the dominant ground cover (NatureServe 2006).

Some shrubs include Crataegus viridis, Ilex decidua, and Ulmus alata. Characteristic grasses could include Schizachyrium scoparium, Sorghastrum nutans, and Andropogon spp. Some other typical herbs include Manfreda virginica, Croton willdenowii, Danthonia spicata, Porteranthus stipulatus, and Pycnanthemum tenuifolium (Hendricks et al. 1991).

Lower areas (drainage ways and depressions) have Quercus michauxii, Quercus pagoda, Quercus phellos, Liquidambar styraciflua, or even Taxodium distichum. Local herb dominance in depressions is of wetland species such as Juncus spp. and Carex spp. For this related and possibly juxtaposed wetland vegetation, see South-Central Interior / Upper Coastal Plain Wet Flatwoods (CES203.480) (NatureServe 2006).

BpS Dominant and Indicator Species

Symbol	Scientific Name	Common Name
QUST	*Quercus stellata*	Post oak
QUAL	*Quercus alba*	White oak
CAOV2	*Carya ovata*	Shagbark hickory
CAGL8	*Carya glabra*	Pignut hickory
QUVE	*Quercus velutina*	Black oak
QUFA	*Quercus falcata*	Southern red oak
QUPA5	*Quercus pagoda*	Cherrybark oak
LIST2	*Liquidambar styraciflua*	Sweetgum

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

Disturbance Description

Fire was an important natural process in this system, and well-burned examples tend to be relatively open-canopied with well-developed herbaceous layers (M. Evans pers. comm.). Our knowledge about the specific role of fire in this system is incomplete, but it is assumed that low-intensity ground fires were significant. Such fires could have originated in other adjacent or interfingered oak-hardwood systems (NatureServe 2006). The frequency and intensity of fire could have varied with drought and climate cycles. The overall fire effect may also be patchy given the xerohydric nature of this system.

Ice storm damage and wind throw, primarily from thunderstorms and tornados are also important disturbance factors.

Fire Frequency

Severity	Avg FI	Percent of All Fires	Min FI	Max FI
Replacement	185	3		
Moderate (Mixed)	180	3		
Low (Surface)	5	94		
All Fires	5	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

Listed by NatureServe (2006) as a large patch system. There is probably considerable variation in size among individual patches.

Adjacency or Identification Concerns

There is considerable microtopographical variation associated with stands of this system. This is part of what distinguishes it from the more uniformly wet "Wet Flatwoods" (CES203.480 -- South-Central Interior / Upper Coastal Plain Wet Flatwoods -- BpS1457). More information is needed to completely distinguish these systems.

The medium tree canopy is an open to mostly closed canopy (70-90% cover). The understory is poorly developed. Ground cover is variable with a low to medium diversity consisting of plants characteristic of dry soils on higher ground and wet soils in depressions.

Issues or Problems

The component associations are poorly known and described. More work is needed to clarify which types are present.

Native Uncharacteristic Conditions

Comments

The model description for this BpS was begun by utilizing one developed for CES203.557 (BpS 1455) -- East Gulf Coastal Plain Southern Loblolly-Hardwood Flatwoods. This was based on the RA model R5GCPF. The principle difference being that this BpS 1326 is a hardwood flatwood, north of the range of loblolly pine as described in BpS 1455.

A large portion of the description for this BpS was developed from NatureServe description for CES203.479 -- South-Central Interior/Upper Coastal Plain Flatwoods. The VDDT model was adopted almost in its entirety from the RA model R5GCPF -- Gulf Coastal Plain Pine Flatwoods.

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	UN	UN	UN	UN	UN	UN	UN	UN	UN	UN
Herb	0.5-1.0	UN	UN	UN	UN	UN	UN	UN	UN	UN	UN
Herb	>1.0	UN	UN	UN	UN	UN	UN	UN	UN	UN	UN
Shrub	0-0.5	UN	UN	UN	UN	UN	UN	UN	UN	UN	UN
Shrub	0.5-1.0	UN	UN	UN	UN	UN	UN	UN	UN	UN	UN
Shrub	1.0-3.0	UN	UN	UN	UN	UN	UN	UN	UN	UN	UN
Shrub	>3.0	UN	UN	UN	UN	UN	UN	UN	UN	UN	UN
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 **15** **Early Development 1 - All Structures**

Indicator Species

Symbol	Scientific Name	Common Name	Canopy Position
QUFA	Quercus falcata	Southern red oak	Upper
QUAL	Quercus alba	White oak	Mid-Upper
QUST	Quercus stellata	Post oak	Upper
LIST2	Liquidambar styraciflua	Sweetgum	Mid-Upper

Description

This class is characterized by post-fire grass regrowth, with numerous forbs, hardwood sprouts and seedlings. Rapid canopy closure (dominated by oaks and sweetgum).

Maximum Tree Size Class

Pole 5-9" DBH

Class B **14** **Mid 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
QUVE	Quercus velutina	Black oak	Mid-Upper
LIST2	Liquidambar styraciflua	Sweetgum	Mid-Upper

Description

This class is characterized by dense, thick stands of oaks and other hardwoods. Fuel loads moderate, with deep layers of leaves on forest floor. Little herbaceous vegetation due to intense shading and thick layers of leaves on forest floor.

Maximum Tree Size Class

Medium 9-21"DBH

Class C **20** **Mid Development 1 - Open**

Indicator Species

Symbol	Scientific Name	Common Name	Canopy Position
QUAL	Quercus alba	White oak	Upper
QUST	Quercus stellata	Post oak	Upper
CAOV2	Carya ovata	Shagbark hickory	Mid-Upper
LIST2	Liquidambar styraciflua	Sweetgum	Mid-Upper

Description

This class is a two-layered open woodland (canopy and shrub/herbaceous) dominated by loblolly pine and oaks, with various hardwoods (oaks, red maple, black gum) present as shrubs or sprouts. Diverse ground layer composed of grasses and forbs. Ground layer becomes more diverse over time as more sunlight reaches the ground layer.

Maximum Tree Size Class

Medium 9-21"DBH

Class D 38 Late Development 1 - Open

Indicator Species

Symbol	Scientific Name	Common Name	Canopy Position
QUAL	Quercus alba	White oak	Upper
QUST	Quercus stellata	Post oak	Upper
CAOV2	Carya ovata	Shagbark hickory	Upper
QUPA5	Quercus pagoda	Cherrybark oak	Mid-Upper

Description

This class is a two-layered open forest or woodland (canopy and herbaceous) dominated by oaks (primarily Quercus stellata, Quercus alba), with various hardwoods (other oaks, red maple, black gum) present as shrubs or sprouts. Very diverse ground layer composed of many species of grasses and forbs.

Maximum Tree Size Class

Large 21-33"DBH

Class E 13 Late Development 1 - Closed

Indicator Species

Symbol	Scientific Name	Common Name	Canopy Position
QUAL	Quercus alba	White oak	Upper
QUST	Quercus stellata	Post oak	Upper
QUFA	Quercus falcata	Southern red oak	Upper
LIST2	Liquidambar styraciflua	Sweetgum	Mid-Upper

Description

This class exhibits dense, thick stands of mature Oaks (primarily Quercus stellata, Quercus alba, but including less fire-tolerant species) intermixed with other oaks and hardwoods. Vines, mid-story, and shrub layer prominent. There is little herbaceous vegetation due to intense shading and thick layers of leaves on forest floor.

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	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	13
Replacement Fire	Early1:ALL	Early1:ALL	0.005	200	Yes	0
Wind or Weather or Stress	Early1:ALL	Early1:ALL	0.01	100	Yes	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	0.007	143	Yes	0
Surface Fire	Mid1:OPN	Mid1:OPN	0.2	5	No	0
Replacement Fire	Mid1:CLS	Early1:ALL	0.005	200	Yes	0
Insects or Disease	Mid1:CLS	Early1:ALL	0.005	200	Yes	0
Wind or Weather or Stress	Mid1:CLS	Mid1:OPN	0.01	100	Yes	0
Mixed Fire	Mid1:CLS	Mid1:OPN	0.02	50	Yes	0
Surface Fire	Mid1:CLS	Mid1:CLS	0.2	5	No	0
Alternative Succession	Late1:OPN	Late1:CLS	1	1	Yes	15
Insects or Disease	Late1:OPN	Late1:OPN	0.003	333	No	0
Replacement Fire	Late1:OPN	Early1:ALL	0.005	200	Yes	0
Wind or Weather or Stress	Late1:OPN	Early1:ALL	0.01	100	Yes	0

Surface Fire	Late1:OPN	Late1:OPN	0.2	5	No	0
Replacement Fire	Late1:CLS	Early1:ALL	0.005	200	Yes	0
Insects or Disease	Late1:CLS	Late1:OPN	0.01	100	Yes	0
Insects or Disease	Late1:CLS	Early1:ALL	0.01	100	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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