

15130

Lower Mississippi River Flatwoods

BpS Model/Description Version: Aug. 2020

Modelers		Reviewers	
Doug Zollner	dzollner@tnc.org	None	None
Tom Foti	Tom@naturalheritage.org	None	None
None	None	None	None

Vegetation Type

Forest and Woodland

Map Zones

45

Geographic Range

This system is comprised of forests, prairies and woodlands on Pleistocene terraces in the Mississippi Alluvial Plain of AR, MO and LA. It occurs primarily west of Crowley's Ridge on Pleistocene glacial outwash deposits in AR and MO, and on Macon Ridge in LA and adjacent AR.

Biophysical Site Description

This system represents predominately wet hardwood flatwoods of the Mississippi River Alluvial Plain. Soils are fine-textured and hardpans may be present in the subsurface. The limited permeability of these soils contributes to perched water tables during substantial portions of the year (when precipitation is greatest and evapotranspiration is lowest). Saturation occurs not from overbank flooding but typically whenever precipitation events occur. The local landscape is often a complex of ridges and swales, usually occurring in close proximity.

The sites are above modern floodplains, but have poor internal drainage and are flat with poor runoff, leading to very wet conditions in winter and spring. They also often have a claypan that restricts both internal drainage and, later in the year, water availability. Therefore, they are very wet in the winter/spring and very dry in the summer, a moisture regime termed hydroxic. Because of this moisture regime, the communities are variable, ranging from willow oak flats to post oak flats to prairies.

Vegetation Description

These communities have a large variety of upland and lowland tree species, ranging from post oak to overcup oak in a small area. Such species diversity may be explained by regeneration of species with dramatically different moisture tolerances on the same site in dry and wet years on these hydroxic sites. The communities of this system are variable, ranging from willow oak flats to post oak flats to prairies. In examples on Macon Ridge (LA), overstory dominants include mockernut hickory (*Carya tomentosa*), black gum (*Nyssa sylvatica*), white oak (*Quercus alba*), cherrybark oak (*Quercus pagoda*), water oak (*Quercus nigra*), basket oak (*Quercus michauxii*), and sweetgum (*Liquidambar styraciflua*). In addition, Shumard's oak (*Quercus shumardii*) and southern-red oak (*Quercus falcata*) are frequent but not usually abundant. Common midstory trees include flowering dogwood (*Cornus florida*), hophorn beam (*Ostrya*

virginiana), devil's walkingstick (*Aralia spinosa*), winged elm (*Ulmus alata*), sassafras (*Sassafras albidum*), and red maple (*Acer rubrum*). Important shrubs/small trees are farkleberry (*Vaccinium arboreum*), rabbiteye blueberry (*Vaccinium virgatum*), rusty blackhaw (*Viburnum rufidulum*), parsley hawthorn (*Crataegus marshallii*), red buckeye (*Aesculus pavia*), Carolina buckthorn (*Frangula caroliniana*), pawpaw (*Asimina triloba*), St. John's wort (*Hypericum hypericoides*), and American stawberry-bush (*Euonymus americanus*). Although infrequent, witch-hazel (*Hamamelis virginiana*) can be locally abundant. Important woody vines include poison ivy (*Toxicodendron radicans*), Virginia creeper (*Parthenocissus quinquefolia*), muscadine (*Vitis rotundifolia*), summer grape (*Vitis aestivalis*) and lanceleaf greenbrier (*Smilax smallii*). *Toxicodendron radicans* and *Parthenocissus quinquefolia* are usually thick on the ground, as well as being represented by high climbing individuals. Common and characteristic herbaceous plants include longleaf woodoats (*Chasmanthium sessiliflorum*), Bosc's panicgrass (*Dichanthelium boscii*), mayapple (*Podophyllum peltatum*), Cherokee sedge (*Carex cherokeensis*), elephant's foot (*Elephantopus carolinianus* and *Elephantopus tomentosus*), littlehead nutrush (*Scleria oligantha*), Virginia snakeroot (*Aristolochia serpentaria*), rattlesnake fern (*Botrychium virginianum*), yellow passionflower (*Passiflora lutea*), wild yam (*Dioscorea villosa*), butterfly pea (*Clitoria mariana*), Canadian blacksnakeroot (*Sanicula canadensis*), white avens (*Geum canadense*), licorice bedstraw (*Galium circaezans*), beaked agrimony (*Agrimonia rostellata*), woodland pinkroot (*Spigelia marilandica*), devil's darning needles (*Clematis virginiana*), American lopseed (*Phryma leptostachya*), Carolina wild petunia (*Ruellia caroliniensis*) and hairy leafcup (*Smallanthus uvedalius*).

BpS Dominant and Indicator Species

Symbol	Scientific Name	Common Name
QUPH	<i>Quercus phellos</i>	Willow oak
QUAL	<i>Quercus alba</i>	White oak
QULY	<i>Quercus lyrata</i>	Overcup oak
QUNI	<i>Quercus nigra</i>	Water oak
NYSY	<i>Nyssa sylvatica</i>	Blackgum
QUMI	<i>Quercus michauxii</i>	Swamp chestnut oak
CAREX	<i>Carex</i>	Sedge
TORA2	<i>Toxicodendron radicans</i>	Eastern poison ivy

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

Disturbance Description

The primary disturbances are flooding (beaver-caused) and windthrow. Low-intensity fires would occur when adjacent systems burned. Mixed and surface fire are both low intensity. However, since dominant tree species are so fire sensitive, fires can cause root-death and open the canopy. Rare replacement fire would also occur following a prolonged drought.

Fire Frequency

Severity	Avg FI	Percent of All Fires	Min FI	Max FI
Replacement	397	13		
Moderate (Mixed)	163	32		
Low (Surface)	95	55		
All Fires	52	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

Large patch system in MZs 45 and 98.

Adjacency or Identification Concerns

Issues or Problems

Native Uncharacteristic Conditions

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	B	B	B	B	B	B	B	B	B	B
Tree	10-25	D	D	D	D	D	D	D	C	C	C
Tree	25-50	D	D	D	D	D	D	D	C	C	C
Tree	>50	D	D	D	D	D	D	D	C	C	C

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 3 Early Development 1 - All Structures

Indicator Species

Symbol	Scientific Name	Common Name	Canopy Position
QUPH	Quercus phellos	Willow oak	Upper
QULY	Quercus lyrata	Overcup oak	Upper
QULA3	Quercus laurifolia	Laurel oak	Upper
CAHY3	Carex hyalinolepis	Shoreline sedge	Lower

Description

Surface fire maintains this class. Buttonbush (*Cephalanthus occidentalis*), swamp privet (*Forestiera* spp.), sweetgum (*Liquidambar styraciflua*), delta post oak (*Q. similis*), water oak, willow oak, laurel oak, overcup oak and palmetto (*Sabal minor*) in southern part of the zone and grades out to the north several wetland herbaceous species. The predominant fuel source is river sedge (*Carex hy*) (sedges and rushes).

Class B	12	Mid Development 1 - Closed
----------------	-----------	-----------------------------------

Indicator Species

Symbol	Scientific Name	Common Name	Canopy Position
QUPH	Quercus phellos	Willow oak	Upper
QULY	Quercus lyrata	Overcup oak	Upper
QULA3	Quercus laurifolia	Laurel oak	Upper

Description

Mixed fire maintains this class but shifts the canopy to the open end of the range. The canopy will fill in quickly. Replacement fire are rare. Herbaceous cover declines and the understory is dominated by leaf litter.

Class C	53	Late Development 1 - Closed
----------------	-----------	------------------------------------

Indicator Species

Symbol	Scientific Name	Common Name	Canopy Position
QUPH	Quercus phellos	Willow oak	Upper
QULY	Quercus lyrata	Overcup oak	Upper
QULA3	Quercus laurifolia	Laurel oak	Upper

Description

Surface fire maintains this class. Replacement fire is rare. Mixed fire and wind or ice events each open the canopy.

Class D	32	Late Development 1 - Open
----------------	-----------	----------------------------------

Indicator Species

Symbol	Scientific Name	Common Name	Canopy Position
QULY	Quercus lyrata	Overcup oak	Upper
QULA3	Quercus laurifolia	Laurel oak	Upper
CAHY3	Carex hyalinolepis	Shoreline sedge	Lower

Description

As this class matures and declines, the canopy opens and sedges return to the understory. River sedge and other dry fine fuels again provides the fuel source to carry a fire. Surface fire and mixed fire maintain this class. Replacement fire are rare.

Model Parameters

Deterministic Transitions

From Class	Begins at (yr)	Succeeds to	After (years)
Early1:ALL	0	Mid1:CLS	10
Mid1:CLS	11	Late1:CLS	65
Late1:CLS	66	Late1:CLS	999
Late1:OPN	66	Late1:OPN	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
Replacement Fire	Early1:ALL	Early1:ALL	0.005	200	Yes	0
Surface Fire	Early1:ALL	Early1:ALL	0.015	67	No	0
Replacement Fire	Mid1:CLS	Early1:ALL	0.003	333	Yes	0
Mixed Fire	Mid1:CLS	Mid1:CLS	0.007	143	No	0
Replacement Fire	Late1:OPN	Early1:ALL	0.003	333	Yes	0
Mixed Fire	Late1:OPN	Late1:OPN	0.005	200	No	0
Surface Fire	Late1:OPN	Late1:OPN	0.015	67	No	0
Alternative Succession	Late1:OPN	Late1:CLS	0.02	50	Yes	0
Replacement Fire	Late1:CLS	Early1:ALL	0.002	500	Yes	0
Wind or Weather or Stress	Late1:CLS	Late1:OPN	0.007	143	Yes	0
Mixed Fire	Late1:CLS	Late1:OPN	0.007	143	Yes	0
Surface Fire	Late1:CLS	Late1:CLS	0.01	100	No	0

References

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

NatureServe. 2006. International Ecological Classification Standard: Terrestrial Ecological Classifications. NatureServe Central Databases. Arlington, VA, U.S.A. Data current as of 18 July 2006.