15130

Lower Mississippi River Flatwoods

BpS Model/Description Version: Aug. 2020

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| **Modelers** |  | **Reviewers** |  |
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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 hydroxeric. 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 hydroxeric 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 | *Quercus phellos* | Willow oak |
| QUAL | *Quercus alba* | White oak |
| QULY | *Quercus lyrata* | Overcup oak |
| QUNI | *Quercus nigra* | Water oak |
| NYSY | *Nyssa sylvatica* | Blackgum |
| QUMI | *Quercus michauxii* | Swamp chestnut oak |
| CAREX | *Carex* | Sedge |
| TORA2 | *Toxicodendron radicans* | 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.