14710

Central Interior and Appalachian Floodplain Systems

BpS Model/Description Version: Aug. 2020

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| --- | --- | --- | --- |
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Vegetation Type

Mixed Upland and Wetland

Map Zones

42, 43

Geographic Range

This system includes the Mississippi river floodplain and the lower stretches of larger river tributaries to the Mississippi River.

Biophysical Site Description

Mostly forested, these systems occur on large river floodplains where topography and process have resulted in the development of a relatively flat, well-developed floodplain with a complex of upland and wetland temperate alluvial vegetation. Many examples of this system will contain well-drained levees, terraces and stabilized bars, and some will include herbaceous sloughs and shrub wetlands, particularly in abandoned channels. The substrate is primarily alluvium. The generally fertile soils are usually sandy to loamy but include local clayey and gravelly areas. This complex includes floodplain forests as well as herbaceous sloughs and shrub wetlands. Emergent and vegetated bars of sand and mud are included in this model.

Vegetation Description

The dominant structure is forest, where characteristic trees include sugar maple (*Acer saccharinum*), cottonwood (*Populus deltoides*), river birch (*Betula nigra*), sugarberry (*Celtis laevigata*), green ash (*Fraxinus pennsylvanica*), black willow (*Salix nigra*), peachleaf willow (*Salix amygdaloides*), sycamore (*Platanus occidentalis*), American elm (*Ulmus americana*), and box elder (*Acer negundo).* The particular mix of tree species will vary across the geographic range of this systems group, with some trees absent over parts of the range. Understory species and shrubs are well developed, often with a prominent woody and herbaceous vine component, species include buttonbush (*Cephalanthus occidentalis*), silky dogwood (*Cornus obliqua*), and pawpaw (*Asimina triloba*), deciduous holly (*Ilex deciduas*), swamp privet (*Forestiera accuminata*), riverbank grape (*Vitis riparia),* catbird grape (*V. palmata*), heartleaf peppervine (*Ampelopsis cordata*), moonseed (*Menispermum canadense*), bristly greenbrier (*Smilax hispida*), trumpet creeper (*Campsis radicans*), oneseed burr cucumber (*Sicyos angulatus*), sedges (*Carex* spp.) and grasses including eastern bottlebrush grass (*Elymus hystrix*), Canada wildrye (*Elymus canadensis*), Indian woodoats (*Chasmanthium latifolium*), and others. Oxbows may support herbaceous vegetation dominated by species including American lotus (*Nelumbo lutea*) and broadleaf cattail (*Typha latifolia*). Frequently reworked mud and sandbars may be dominated by Missouri river willow (*Salix eriocephala*), young *Salix nigra* and *Fraxinus pennsylvanica*, *Platanus occidentalis,* or *Populus deltoides*, or they may have sparse vegetation of a wide variety of annual and perennial herbs of weedy habits.

BpS Dominant and Indicator Species

|  |  |  |
| --- | --- | --- |
| **Symbol** | **Scientific Name** | **Common Name** |
| ACSA2 | *Acer saccharinum* | Silver maple |
| PODE3 | *Populus deltoides* | Eastern cottonwood |
| BENI | *Betula nigra* | River birch |
| CELA | *Celtis laevigata* | Sugarberry |
| FRPE | *Fraxinus pennsylvanica* | Green ash |
| SALIX | *Salix* | Willow |
| ULAM | *Ulmus americana* | American elm |
| PLOC | *Platanus occidentalis* | American sycamore |

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

Disturbance Description

This system was an extremely dynamic floodplain with historic changes in channel course resulting in 200-300ft of bank erosion in a single river rise. Water flow was characterized by a spring flood pulse from rain or melting snow followed by declining flows in the summer and fall. Most floodplains are underwater each spring, and some areas may be submerged by high-water events during the growing season. The river was dominated by large sediment transport.

Microtopography determines how long the various habitats are inundated. Floodplain morphology can be altered by frequent severe floods. The sediment deposition in the floodplain was a significant disturbance factor influencing natural communities and fire regimes. This physical environment of frequent sediment deposition in the floodplain and the braided channeling of the river presented significant barrier to the spread of fire.

Fire Frequency

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Severity** | **Avg FI** | **Percent of All Fires** | **Min FI** | **Max FI** |
| Replacement |  |  |  |  |
| Moderate (Mixed) |  |  |  |  |
| Low (Surface) |  |  |  |  |
| All Fires |  |  |  |  |

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

None

Adjacency or Identification Concerns

Issues or Problems

Federal reservoirs have had a serious and negative effect, along with agriculture that has converted much floodplain acreage to drained agricultural land. The entire Mississippi River within this map zone (MZ) is affected by damming and has essentially been turned into pools.

Native Uncharacteristic Conditions

Comments

Models and descriptions for MZ42 and MZ43 were identified as duplicates in the Biophysical Settings (BpS) review process, except the Geographic Range information. The description from MZ42 was used for both map zones as the range information was more specific.

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 | UN | UN | UN | UN |
| Herb | 0.5-1.0 | A | A | A | A | A | A | 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 | B | B | B | B | B | B | B | B | B | B |
| Tree | 5-10 | C | C | C | C | C | C | C | C | C | C |
| Tree | 10-25 | D | D | D | D | D | D | D | D | D | D |
| Tree | 25-50 | D | D | D | D | D | D | D | D | D | D |
| Tree | >50 | D | D | D | D | D | D | D | D | D | D |

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 5 Early Development 1 - All Structures

Indicator Species

|  |  |  |  |
| --- | --- | --- | --- |
| **Symbol** | **Scientific Name** | **Common Name** | **Canopy Position** |
| POLYG | Polygala | Polygala | Upper |
| AMBRO | Ambrosia | Ragweed | Upper |
| BIDEN | Bidens | Beggarticks | Upper |

Description

Immediate post scouring flood or depositional event. Bare soil or low annual weeds like bidens, ragweeds, and smartweeds. Scouring events and flooding events maintain the class. This class will succeed to shrubs if it is not replaced with another scouring event or a depositional event.

*Maximum Tree Size Class*  
None

Class B 23 Mid Development 1 - Closed

Indicator Species

|  |  |  |  |
| --- | --- | --- | --- |
| **Symbol** | **Scientific Name** | **Common Name** | **Canopy Position** |
| SALIX | Salix | Willow | Upper |
| FRPE | Fraxinus pennsylvanica | Green ash | Upper |
| PODE3 | Populus deltoides | Eastern cottonwood | Upper |

Description

Shrub stage. Dominant species include willow, ash and cottonwood. A scouring or depositional event will replace the systems. Flooding event maintains class.

*Maximum Tree Size Class*  
Sapling >4.5ft; <5"DBH

Class C 40 Mid Development 1 - Open

Indicator Species

|  |  |  |  |
| --- | --- | --- | --- |
| **Symbol** | **Scientific Name** | **Common Name** | **Canopy Position** |
| FRPE | Fraxinus pennsylvanica | Green ash | Upper |
| PODE3 | Populus deltoides | Eastern cottonwood | Upper |
| SALIX | Salix | Willow | Mid-Upper |

Description

This is a young floodplain stage. Trees begin to develop. Flooding may maintain or move backward in time. Scouring event replaces the class.

*Maximum Tree Size Class*  
Medium 9-21"DBH

Class D 32 Late Development 1 - Open

Indicator Species

|  |  |  |  |
| --- | --- | --- | --- |
| **Symbol** | **Scientific Name** | **Common Name** | **Canopy Position** |
| PODE3 | Populus deltoides | Eastern cottonwood | None |
| FRPE | Fraxinus pennsylvanica | Green ash | None |
| BENI | Betula nigra | River birch | None |

Description

The floodplain has large trees and includes species like silver maple, *Populus deltoides, Betula nigra, Celtis laevigata, Fraxinus pennsylvanica, Salix nigra, Salix amygdaloides, Platanus occidentalis, Ulmus americana,* and *Acer negundo*. Scouring event replaces the class. Flooding maintain the class or moves it back in time.

*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:CLS | 5 |
| Mid1:CLS | 6 | Mid1:OPN | 20 |
| Mid1:OPN | 21 | Late1:OPN | 60 |
| Late1:OPN | 61 | 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** |
| Optional 2 | Early1:ALL | Early1:ALL | 0.01 | 100 | No | 0 |
| Optional 1 | Early1:ALL | Early1:ALL | 0.01 | 100 | Yes | 0 |
| Optional 2 | Mid1:OPN | Mid1:OPN | 0.01 | 100 | No | 0 |
| Optional 2 | Mid1:OPN | Mid1:CLS | 0.01 | 100 | Yes | 0 |
| Optional 1 | Mid1:OPN | Early1:ALL | 0.01 | 100 | Yes | 0 |
| Optional 2 | Mid1:CLS | Mid1:CLS | 0.01 | 100 | No | 0 |
| Optional 1 | Mid1:CLS | Early1:ALL | 0.01 | 100 | Yes | 0 |
| Optional 2 | Late1:OPN | Mid1:CLS | 0.01 | 100 | Yes | 0 |
| Optional 2 | Late1:OPN | Late1:OPN | 0.01 | 100 | No | 0 |
| Optional 1 | Late1:OPN | Early1:ALL | 0.01 | 100 | Yes | 0 |

Optional Disturbances

Optional 1: Scouring/depositional replacement event

Optional 2: Flooding

References

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