14720

Central Interior and Appalachian Riparian Systems

BpS Model/Description Version: Aug. 2020

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| **Modelers** |  | **Reviewers** |  |
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Vegetation Type

Mixed Upland and Wetland

Map Zones

32, 35

Geographic Range

Occurs throughout map zone (MZ) 32, primarily ECOMAP (Cleland et al. 2007) subsections 255Ba, 255Ee, 255Eb, 255Ed. Extending into western edges of MZ35.

Biophysical Site Description

Occurs along medium to very small, intermittent to ephemeral streams. This type is ubiquitous throughout, but species composition and flood regimes are thought to be dependent on soil and geologic substrates. Generally, the soils in this system are thinner alluvium than on floodplain terraces.

Vegetation Description

Usually sparse to sometimes fairly dense woodlands that may be dominated by species such as sugarberry (*Celtis laevigata*), netleaf hackberry (*Celtis reticulata*), bur oak (*Quercus macrocarpa*), shumard oak (*Q. shumardii*), black walnut (*Juglans nigra*), wingleaf soapberry (*Sapindus saponaria*), black willow (*Salix nigra*), green ash (*Fraxinus pennsylvanica)*, pecan (*Carya illinoinensis*), American elm (*Ulmus americana*), and red elm (*U. rubra*). Eastern cottonwood (*Populus deltoides*) tends to predominate in sparse woodlands. Height of vegetation is variable on an east-to-west moisture gradient. Herbaceous species can include wood avens (*Geum canadense*), hairy woodland brome (*Bromus pubescens)*, switchgrass (*Panicum virgatum*), Indian woodoats (*Chasmanthium latifolium*), bluebill (*Clematis pitcheri*), and wildrye (*Elymus virginicus*). Herbaceous species may occur as clumps or as a continuous herbaceous layer, controlled by soil development.

BpS Dominant and Indicator Species

|  |  |  |
| --- | --- | --- |
| **Symbol** | **Scientific Name** | **Common Name** |
| ULRU | *Ulmus rubra* | Slippery elm |
| CELA | *Celtis laevigata* | Sugarberry |
| FRPE | *Fraxinus pennsylvanica* | Green ash |
| QUMA2 | *Quercus macrocarpa* | Bur oak |
| JUNI | *Juglans nigra* | Black walnut |
| CHLA5 | *Chasmanthium latifolium* | Indian woodoats |
| BRPU6 | *Bromus pubescens* | Hairy woodland brome |

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

Disturbance Description

Flooding will be the dominant process in this system. Fuels in this system are variable and fire return interval is partially determined by the mean fire return interval of surrounding systems where fuels are present.

Fire Frequency

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Severity** | **Avg FI** | **Percent of All Fires** | **Min FI** | **Max FI** |
| Replacement | 186 | 14 |  |  |
| Moderate (Mixed) |  |  |  |  |
| Low (Surface) | 31 | 86 |  |  |
| All Fires | 26 | 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

Linear. Up to 100s of acres but generally smaller.

Adjacency or Identification Concerns

This system is similar to Western Great Plains Floodplain but differs due to less well-developed alluvial soils. Stream flow regimes within this system range from intermittent to ephemeral.

Issues or Problems

Urban and ranchette development uses impact this system. Giant reed (*Arundo donax*) can dominate these systems. Within much of the agricultural regions, alteration of surrounding watersheds has eliminated stream meanders, increased incisement, and intensified flashy behavior.

Native Uncharacteristic Conditions

Comments

This model was created for MZs 32 and 35.

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 | B | B | B | B | B | B | B | B |
| Tree | 5-10 | C | C | C | C | C | C | C | C | C | C |
| Tree | 10-25 | C | C | C | C | C | C | C | C | C | C |
| Tree | 25-50 | C | C | C | C | C | C | C | C | C | C |
| Tree | >50 | C | C | C | C | C | C | C | 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 7 Early Development 1 - Open

Indicator Species

|  |  |  |  |
| --- | --- | --- | --- |
| **Symbol** | **Scientific Name** | **Common Name** | **Canopy Position** |
| AMFR | Amorpha fruticosa | Desert false indigo | Middle |
| FRPE | Fraxinus pennsylvanica | Green ash | Upper |
| PAVI2 | Panicum virgatum | Switchgrass | Lower |
| CAREX | Carex | Sedge | Lower |

Description

The upper-layer lifeform is not dominant. Desert false indigo (*Amorpha fruticosa*) and black willow (*Salix nigra*) are dominant woody species -- may comprise up to 50% canopy cover. There are many plant communities that make up this system. *Amorpha* is typical in some locales. It is likely that other communities have a shrubby successional stage, which may include creek plum (*Prunus rivularis*) and tree seedlings and saplings of later successional communities.

Sparse woodland with some herbaceous cover, canopy low.

Fire plays a minor role in this system because of the general lack of fine fuels and mesic conditions due to its topographic position.

Flood is the more prominent process. Flood returns system to open (resets age to 0). Replacement fires uncommon (reset age to 0). Surface fire more common but does not set stage back.

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

Class B 20 Mid Development 1 - Closed

Indicator Species

|  |  |  |  |
| --- | --- | --- | --- |
| **Symbol** | **Scientific Name** | **Common Name** | **Canopy Position** |
| CELA | Celtis laevigata | Sugarberry | Upper |
| ULRU | Ulmus rubra | Slippery elm | Upper |
| FRPE | Fraxinus pennsylvanica | Green ash | Upper |
| ELVI | Elymus villosus | Hairy wildrye | Lower |

Description

The upper-layer lifeform is not the dominant lifeform. This community is only representative of a number of possible communities. In this case, it represents a seral community dominated by at least some of the later successional species.

Woodland developing with higher canopy and denser canopy but still relatively open.

Class persists in the absence of disturbance. Replacement fire uncommon returning to Class A. Surface fire more common but not shifting state. Larger flood required to return to Class A.

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

Class C 73 Late Development 1 - Closed

Indicator Species

|  |  |  |  |
| --- | --- | --- | --- |
| **Symbol** | **Scientific Name** | **Common Name** | **Canopy Position** |
| QUMA2 | Quercus macrocarpa | Bur oak | Upper |
| CAIL2 | Carya illinoinensis | Pecan | Upper |
| CELA | Celtis laevigata | Sugarberry | Mid-Upper |
| ULRU | Ulmus rubra | Slippery elm | Middle |

Description

Woodland to forest developing with higher and denser canopy -- approaching closed canopy.

Class is a continuation of foregoing and begins to express well by 50yrs. Replacement fire is uncommon returning to Class B. Surface fire remains and does not change the successional state, especially along the ecotone with grass and shrublands. Flood is unlikely to return to Class B.

*Maximum Tree Size Class*  
Large 21-33" DBH

Model Parameters

Deterministic Transitions

|  |  |  |  |
| --- | --- | --- | --- |
| **From Class** | **Begins at (yr)** | **Succeeds to** | **After (years)** |
| Early1:OPN | 0 | Mid1:CLS | 20 |
| Mid1:CLS | 21 | Late1:CLS | 50 |
| Late1:CLS | 51 | 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** |
| Replacement Fire | Early1:OPN | Early1:OPN | 0.0067 | 149 | Yes | 0 |
| Surface Fire | Early1:OPN | Early1:OPN | 0.033 | 30 | No | 0 |
| Optional 1 | Early1:OPN | Early1:OPN | 0.033 | 30 | No | 0 |
| Replacement Fire | Mid1:CLS | Early1:OPN | 0.0067 | 149 | Yes | 0 |
| Optional 1 | Mid1:CLS | Early1:OPN | 0.01 | 100 | Yes | 0 |
| Surface Fire | Mid1:CLS | Mid1:CLS | 0.033 | 30 | No | 0 |
| Optional 1 | Late1:CLS | Mid1:CLS | 0.002 | 500 | Yes | 0 |
| Replacement Fire | Late1:CLS | Mid1:CLS | 0.005 | 200 | Yes | 0 |
| Surface Fire | Late1:CLS | Late1:CLS | 0.033 | 30 | No | 0 |

Optional Disturbances

Optional 1: flooding

References

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