14710

Central Interior and Appalachian Floodplain Systems

BpS Model/Description Version: Aug. 2020

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| **Modelers** |  | **Reviewers** |  |
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| None | None | None | None |
| None | None | None | None |

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Vegetation Type

Mixed Upland and Wetland

Map Zones

32, 35

Geographic Range

Small to large rivers with permanent flow and alluvial deposits throughout map zones (MZs) 32 and 37 on its western margins.

Biophysical Site Description

This system occurs on floodplains along perennial rivers and streams in east-central Texas, Oklahoma through the interior Midwest and Appalachians. All occurrences are on deep alluvial soils.

Vegetation Description

Canopy dominants may include pecan (*Carya illinoinensis*), bitternut hickory (*C. cordiformis*), American elm (*Ulmus americana*), red elm (*U. rubra*), Sugarberry (*Celtis laevigata*), green ash (*Fraxinus pennsylvanica*), white ash (*F. americana*), sycamore (*Platanus occidentalis*), box elder (*Acer negundo*), black walnut (*Juglans nigra*), bur oak (*Quercus macrocarpa*), Shumard’s oak (*Q. shumardii*), red mulberry (*Morus rubra*), and western soapberry (*Sapindus drummondii*). Tree canopy closure is usually ~60-70% and up to 10-12m in height. Alluvial sedimentation processes dominate the formation and maintenance of this system. However, overgrazing and/or overbrowsing may influence recruitment of overstory species and composition of the understory and herbaceous layers. Shrub species may include deciduous holly (*Ilex decidua*), gum bumelia (*Sideroxylon lanuginosum*), green hawthorn (*Crataegus viridis*), Carolina buckthorn (*Frangula caroliniana*), persimmon (*Diospyros virginiana*), eastern red cedar (*Juniperus virginiana*), roughleaf dogwood (*Cornus drummondii*), corralberry (*Symphorocarpos occidentalis*), poison ivy (*Toxicodendron radicans*), greenbriar (*Smilax* spp.), and rusty blackhaw (*Viburnum rufidulum*). Shrub abundance may be dense in patches following disturbance but is generally sparse. Herbaceous cover includes Virginia wildrye (*Elymus virginicus*), white crownbeard (*Verbesina virginica*), Indian woodoats (*Chasmanthium latifolium*), Drummond’s aster (*Symphyotrichum drummondii* var. *texanum*), white avens (*Geum canadense*), Canadian blacksnakeroot (*Sanicula canadensis*), switchgrass (*Panicum virgatum*), bedstraw (*Galium* spp.), and sedges (*Carex* spp.). Herbaceous cover may be quite high, especially in situations where shrub cover is low.

BpS Dominant and Indicator Species

|  |  |  |
| --- | --- | --- |
| **Symbol** | **Scientific Name** | **Common Name** |
| CAIL2 | *Carya illinoinensis* | Pecan |
| ULRU | *Ulmus rubra* | Slippery elm |
| CELA | *Celtis laevigata* | Sugarberry |
| ILDE | *Ilex decidua* | Possumhaw |
| FRPE | *Fraxinus pennsylvanica* | Green ash |
| ELVI3 | *Elymus virginicus* | Virginia wildrye |
| CHLA5 | *Chasmanthium latifolium* | Indian woodoats |
| VEVI3 | *Verbesina virginica* | White crownbeard |

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

Disturbance Description

Flooding is the most significant process controlling this system. Flooding is expected to reach across this site between 5 and 25yrs. Fire occurs infrequently relative to surrounding systems. Fuels tend to stay moister due to shady conditions and low topographic position.

Fire Frequency

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Severity** | **Avg FI** | **Percent of All Fires** | **Min FI** | **Max FI** |
| Replacement | 184 | 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

Size can range from 100s to 1,000s of acres.

Adjacency or Identification Concerns

Crosstimbers Riparian Woodland/Forest occurs along upper reaches of streams where stream flows become intermittent and alluvial deposits are thinner.

Issues or Problems

The increasing abundance of ravennagrass (*Saccharum ravennae*) on open floodplains and sandbars may be a future threat and should be monitored. Conversion to bermudagrass (*Cynodon dactylon*) pasture has been a past and continuing land use practice.

The climate change for this area is predicted to have fewer rainstorms, but the storms will be more intense than present. When this occurs, the water flow may be increased to such that more disturbance will occur to the habitat. This increase in intense storms and more disturbance on the floodplain is being observed in Texas. The disturbance has increased debris piles and decreased bank stability. Both fire and erosion issues may occur due to the increased habitat disturbance.

Native Uncharacteristic Conditions

Comments

For MZ35, this model was adopted without changes from the same Biophysical Setting (BpS) for MZ32. This model was created for MZ32. E.O. Van Auken (UTSA) is a suggested reviewer for MZ32.

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 | B | B | B | B | B | B | B |
| Tree | 5-10 | B | B | B | B | B | B | B | B | B | B |
| Tree | 10-25 | B | B | B | B | B | B | B | B | B | B |
| Tree | 25-50 | B | B | B | B | B | B | B | B | B | B |
| Tree | >50 | B | B | B | B | B | B | B | B | B | B |

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 30 Early Development 1 - All Structures

Indicator Species

|  |  |  |  |
| --- | --- | --- | --- |
| **Symbol** | **Scientific Name** | **Common Name** | **Canopy Position** |
| ACNE2 | Acer negundo | Boxelder | Middle |
| SANI | Salix nigra | Black willow | Middle |
| TORA2 | Toxicodendron radicans | Eastern poison ivy | Low-Mid |
| CHLA5 | Chasmanthium latifolium | Indian woodoats | Lower |

Description

Dominants represent one of the many possible plant communities, depending on underlying substrate and east-to-west moisture gradient.

Growth rates among species are variable. Boxelder (*Acer negundo*), for example, is a fast-growing species, whereas shumard oak (*Q. shumardii*) is a slow-growing species. Open canopy resulting from flood events and rare fire events. This class has trees in the canopy, but the shrub layer may be denser. Surface fires have little effect. Replacement fire is much less frequent. Wind/weather represents floods capable of replacing this system with small trees.

*Maximum Tree Size Class*  
Pole 5-9" DBH

Class B 70 Late Development 1 - Closed

Indicator Species

|  |  |  |  |
| --- | --- | --- | --- |
| **Symbol** | **Scientific Name** | **Common Name** | **Canopy Position** |
| ULRU | Ulmus rubra | Slippery elm | Upper |
| FRPE | Fraxinus pennsylvanica | Green ash | Upper |
| QUSH | Quercus shumardii | Shumard's oak | Middle |
| SYOC | Symphoricarpos occidentalis | Western snowberry | Lower |

Description

Dominants represent one of the many possible plant communities, depending on underlying substrate and east-to-west moisture gradient.

Canopy closed, with moderately tall trees. May be moved from this state by infrequent large flood events. Surface fire occurs. Replacement fires would be associated with extreme drought conditions. Ice storms/blowdowns are capable of replacing the type. Beaver pond flooding, though small patch, is expected to cycle throughout the forest over the long term, perhaps at a scale of 100s or 1,000s of years. This class persists in the absence of disturbance.

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

Model Parameters

Deterministic Transitions

|  |  |  |  |
| --- | --- | --- | --- |
| **From Class** | **Begins at (yr)** | **Succeeds to** | **After (years)** |
| Early1:ALL | 0 | Late1:CLS | 24 |
| Late1:CLS | 25 | 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:ALL | Early1:ALL | 0.0067 | 149 | Yes | 0 |
| Wind or Weather or Stress | Early1:ALL | Early1:ALL | 0.013 | 77 | No | 0 |
| Surface Fire | Early1:ALL | Early1:ALL | 0.033 | 30 | No | 0 |
| Replacement Fire | Late1:CLS | Early1:ALL | 0.005 | 200 | Yes | 0 |
| Optional 1 | Late1:CLS | Early1:ALL | 0.005 | 200 | Yes | 0 |
| Wind or Weather or Stress | Late1:CLS | Early1:ALL | 0.0067 | 149 | Yes | 0 |
| Surface Fire | Late1:CLS | Late1:CLS | 0.033 | 30 | No | 0 |

Optional Disturbances

Optional 1: beaver impoundment

References

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