11620

Western Great Plains Floodplain Systems

BpS Model/Description Version: Aug. 2020

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| **Modelers** |  | **Reviewers** |  |
| Charlotte Reemts | creemts@tnc.org | None | None |
| Lee Elliott | lelliott@tnc.org | None | None |
| None | None | None | None |

Vegetation Type

Mixed Upland and Wetland

Map Zones

32, 35

Geographic Range

Small to large rivers with permanent flow and alluvial deposits throughout much of the Edwards Plateau, map zone (MZ) 35, and into adjacent MZs 32 and 36 on their western margins.

Biophysical Site Description

This system occurs on floodplain terraces along perennial rivers and streams in central Texas, usually on deep alluvial soils.

Vegetation Description

Canopy dominants may include pecan (*Carya illinoinensis*), cedar elm (*Ulmus crassifolia*), American elm (*U. americana*), sugarberry (*Celtis laevigata*), plateau oak (*Quercus fusiformis*), Texas ash (*Fraxinus texensis*), sycamore (*Platanus occidentalis*), boxelder (*Acer negundo*), Arizona walnut (*Juglans major*), bur oak (*Q. macrocarpa*), red mulberry (*Morus rubra*), green ash (*Fraxinus pennsylvanica*), western soapberry (*Sapindus drummondii*), or baldcypress (*Taxodium distichum*). Tree canopy is usually around 60-70% and up to 10-12m in height. Pecan may be more likely to occur in deeper and better developed alluvial soils. Apparent dominance of pecan may also be an artifact of preferential harvesting of other species, leaving this species in greater abundance. 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 American beautyberry (*Callicarpa americana*), deciduous holly (*Ilex decidua*), gum bully (*Sideroxylon lanuginosum*), Carolina buckthorn (*Frangula caroliniana*), Texas persimmon (*Diospyros texana*), eastern red-cedar (*Juniperus virginiana*), roughleaf dogwood (*Cornus* *drummondii*), and rusty blackhaw (*Viburnum* *rufidulum*), which may occur as dense patches following disturbance, but are generally fairly sparse. Herbaceous cover includes Virginia wildrye (*Elymus virginicus*), white crownbeard (*Verbesina virginica*), Indian woodoats (*Chasmanthium latifolium*), eastern gamagrass (*Tripsacum dactyloides*), Drummond’s aster (*Symphyotrichum drummondii var. texanum*), white avens (*Geum canadense*), Canadian black-snakeroot (*Sanicula canadensis*), switchgrass (*Panicum virgatum*), licorice bedstraw (*Galium circaezans*), 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 |
| ULCR | *Ulmus crassifolia* | Cedar elm |
| CELA | *Celtis laevigata* | Sugarberry |
| ILDE | *Ilex decidua* | Possumhaw |
| CAAM2 | *Callicarpa americana* | American beautyberry |
| 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. Fire occurs relatively infrequently compared 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 | 181 | 7 |  |  |
| Moderate (Mixed) |  |  |  |  |
| Low (Surface) | 14 | 93 |  |  |
| All Fires | 13 | 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

Wider and longer than Edwards Plateau Riparian and can be hundreds to low thousands of acres.

Adjacency or Identification Concerns

Edwards Plateau Riparian occurs along upper reaches of streams where stream flows become intermittent and alluvial deposits are thinner. Like other wooded wetland systems, this tends to merge with riparian systems as streams become smaller upstream.

Issues or Problems

Native Uncharacteristic Conditions

Comments

This model was developed for MZs 32 and 35 by Charlotte Reemts and Lee Elliott. This BpS may also occur in MZ36; the same model could be applied there. Suggested reviewers for MZs 32, 35, 36 include E.O. Van Auken (UTSA).

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 | A | A | A | B | B | B | B | B | B | B |
| Tree | 10-25 | A | A | A | B | B | B | B | B | B | B |
| Tree | 25-50 | A | A | A | B | B | B | B | B | B | B |
| Tree | >50 | A | A | A | 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 27 Early Development 1 - Open

Indicator Species

|  |  |  |  |
| --- | --- | --- | --- |
| **Symbol** | **Scientific Name** | **Common Name** | **Canopy Position** |
| CAIL2 | Carya illinoinensis | Pecan | Upper |
| ULCR | Ulmus crassifolia | Cedar elm | Upper |
| ILDE | Ilex decidua | Possumhaw | Middle |
| CODR | Cornus drummondii | Roughleaf dogwood | Middle |

Description

Growth rates among species are variable, with species like *A. negundo* having a rapid growth rate and species like *C. illinoinensis* growing more slowly. Open canopy results from flood events and rare fire events. Still has trees in the canopy, but shrub layer may be denser. Surface fire has little effect. Replacement fire is much less frequent and resets age to zero. Wind/weather represents floods capable of replacing this system (reset age to zero) with small trees.

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

Class B 73 Late Development 1 - Closed

Indicator Species

|  |  |  |  |
| --- | --- | --- | --- |
| **Symbol** | **Scientific Name** | **Common Name** | **Canopy Position** |
| CAIL2 | Carya illinoinensis | Pecan | Upper |
| ULCR | Ulmus crassifolia | Cedar elm | Upper |
| VEVI2 | Verbascum virgatum | Wand mullein | Lower |
| ELVI3 | Elymus virginicus | Virginia wildrye | Lower |

Description

Canopy closed; height can be up to 12m. May be moved from this state by infrequent large flood events. Surface fire occurs here and maintains class. Replacement fire also occurs more rarely. Stand-replacement flood occurs infrequently. This class persists in the absence of disturbance.

*Maximum Tree Size Class*  
Very Large >33" DBH

Model Parameters

Deterministic Transitions

|  |  |  |  |
| --- | --- | --- | --- |
| **From Class** | **Begins at (yr)** | **Succeeds to** | **After (years)** |
| Early1:OPN | 0 | Late1:CLS | 25 |
| Late1:CLS | 26 | 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 | 0.007 | 143 | Yes | 0 |
| Wind or Weather or Stress | Early1:OPN | Early1:OPN | 0.01 | 100 | Yes | 0 |
| Surface Fire | Early1:OPN | Early1:OPN | 0.07 | 14 | No | 0 |
| Replacement Fire | Late1:CLS | Early1:OPN | 0.005 | 200 | Yes | 0 |
| Wind or Weather or Stress | Late1:CLS | Early1:OPN | 0.007 | 143 | Yes | 0 |
| Surface Fire | Late1:CLS | Late1:CLS | 0.07 | 14 | No | 0 |

References

Ford, A.L. and O.W. Van Auken. 1982. The distribution of woody species in the Guadalupe River floodplain forest in the Edwards Plateau of Texas. Southwestern Naturalist 27(4): 383-392.

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