13340

Ozark-Ouachita Mesic Hardwood Forest

BpS Model/Description Version: Aug. 2020

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|  |  |  |  |
| --- | --- | --- | --- |
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| None | None | None | None |

Vegetation Type

Forest and Woodland

Map Zones

32, 43, 44

Geographic Range

This Biophysical Setting (BpS) primarily occurs in the Interior Low Plateau, southern Central Lowland, Ozark Plateaus and Ouachita physiographic provinces. It includes parts of Missouri, Arkansas and Oklahoma.

Biophysical Site Description

This type is found on a wide range of topographic positions, including mixed mesophytic forests, seeps/springs and smaller riparian areas associated with intermittent and/or ephemeral streams. This system is found on primarily north- and east-facing aspects, toeslopes, small valley bottoms, as well as other protected slopes and ravines along intermittent and/or ephemeral streams. Distribution is influenced by local conditions affecting moisture, aspect, elevation and soil productivity. Closed conditions are multiple canopy usually late-seral forests. These systems are generally small, isolated, and/or disjunct and are generally "embedded" in a larger landscape matrix. These communities are maintained primarily through naturally occurring circumstances such as aspect, elevation, soil moisture conditions, and soil productivity, except for mortality or other disturbance-induced openings or gaps.

Vegetation Description

The vegetation is variable along moisture gradients, but includes (on more mesic sites) generally more fire-intolerant species such as red maple (*Acer rubrum*), sugar maple (*A. saccharum*) and other hardwood components. Mesic sites in mid and late seral stages tend to be closed forest with understories (sometimes more herbaceous than woody). This system is found on primarily north and east facing aspects, toeslopes and small valley bottoms, as well as other protected slopes and ravines along intermittent and/or ephemeral streams. Here, American beech (*Fagus grandifolia*) may be a major tree species with red and white oak (Quercus alba), sweetgum (*Liquidambar styraciflua*), American basswood (*Tilia americana*), cucumbertree (*Magnolia acuminata*), or other mesic tree species in upper canopies. In some situations, red, sugar, black (*A. nigrum*) and other maples may be present. Umbrella magnolia (Magnolia tripetala), blackgum (*Nyssa sylvatica*), American holly (*Ilex opaca*), grape arbors and woody vines may be found in the midstory and understory. Vegetation associated primarily with riparian and seep/spring systems include strawberry bush (*Euonymus obovatus*), American hornbeam (*Carpinus caroliniana*), hophornbeam (*Ostrya virginiana*), and herbaceous obligates such as yellow ladyslippers (*Cypripedium pubescens*). American ginseng (*Panax quinquefolius*) may occur within the riparian areas or on benches on the steep mesic north slopes.

BpS Dominant and Indicator Species

|  |  |  |
| --- | --- | --- |
| **Symbol** | **Scientific Name** | **Common Name** |
| FAGR | *Fagus grandifolia* | American beech |
| QURU | *Quercus rubra* | Northern red oak |
| ACSA3 | *Acer saccharum* | Sugar maple |
| ACRU | *Acer rubrum* | Red maple |
| QUAL | *Quercus alba* | White oak |
| MAAC | *Magnolia acuminata* | Cucumber-tree |

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

Disturbance Description

This BpS is fire regime group I primarily, but with lower frequency than drier types and primarily low intensity surface fire with occasional mosaic (mixed severity) or replacement fire. Mean fire return interval (MFRI) is about 25yrs with wide year-to-year and within-type variation related to moisture cycles, degree of sheltering, and proximity to more fire-prone types. Anthropogenic fire is considered and contributes to within-type MFRI variation. Drought and moisture cycles play a strong role interacting with fire and insect and disease. Other natural disturbances may include wind and ice.

Fire Frequency

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Severity** | **Avg FI** | **Percent of All Fires** | **Min FI** | **Max FI** |
| Replacement | 316 | 6 | 50 | 300 |
| Moderate (Mixed) | 109 | 18 | 20 | 150 |
| Low (Surface) | 25 | 76 | 5 | 35 |
| All Fires | 19 | 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

Landscape adequate in size to contain natural variation in vegetation and disturbance regime. Topographically complex areas can be relatively small (<1,000ac). Larger landscapes up to a few thousand acres in size such as Black Fork, Rich, Fourche, Magazine and Winding Stairs (Oklahoma) Mountains.

Adjacency or Identification Concerns

This BpS was defined using NatureServe - Ozark-Ouachita Mesic Hardwood Forest (CES202.043), Ozark-Ouachita Seeps/Springs, South-Central Interior Small Stream and Riparian (202.706). Other types adjacent could include CES202.306 Ouachita Montane Oak Forest, and CES202.708 Ozark-Ouachita Dry-Mesic Oak Forest. This system includes the western mesophytic types (R8 Old-Growth Type).

Issues or Problems

Type is highly variable across the complex terrains. Riparian and seep/spring types are embedded within the surrounding mixed western mesophytic forests. Natural fire typically burns at lower intensities and probably less frequently in this type, particularly in the small drainages and other wet inclusions. Disturbance dynamics are not well understood.

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 | 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 8 Early Development 1 - All Structures

Indicator Species

|  |  |  |  |
| --- | --- | --- | --- |
| **Symbol** | **Scientific Name** | **Common Name** | **Canopy Position** |
| ACRU | Acer rubrum | Red maple | Upper |
| FAGR | Fagus grandifolia | American beech | Upper |
| QURU | Quercus rubra | Northern red oak | Upper |
| PRSE2 | Prunus serotina | Black cherry | Upper |

Description

Sprouts, seedlings and saplings of major overstory species in gaps and openings created or maintained by wind/weather/stress, aboriginal or lightning-caused stand replacement fire and insect/disease. Mostly fire-intolerant species present, but with minor components of fire-tolerant species present.

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

Class B 24 Mid Development 1 - Closed

Indicator Species

|  |  |  |  |
| --- | --- | --- | --- |
| **Symbol** | **Scientific Name** | **Common Name** | **Canopy Position** |
| ACRU | Acer rubrum | Red maple | Mid-Upper |
| ACSA3 | Acer saccharum | Sugar maple | Upper |
| QURU | Quercus rubra | Northern red oak | Upper |
| FAGR | Fagus grandifolia | American beech | Mid-Upper |

Description

Dominated by young to mid-seral with some development of mid and understory species. Closed canopy conditions are more a function of mesic (or topographically protected) conditions. Understory/midstory development with at least two layers present (dependent on age) on these more mesic sites. In places, sweet gum may be a pre-dominant species.

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

Class C 68 Late Development 1 - Closed

Indicator Species

|  |  |  |  |
| --- | --- | --- | --- |
| **Symbol** | **Scientific Name** | **Common Name** | **Canopy Position** |
| QUAL | Quercus alba | White oak | Upper |
| ACSA3 | Acer saccharum | Sugar maple | Middle |
| FAGR | Fagus grandifolia | American beech | Low-Mid |
| MAAC | Magnolia acuminata | Cucumber-tree | Mid-Upper |

Description

Canopy generally more fire-intolerant species with minor amounts of oak species. Multi-canopied stands with tree gaps may include other hardwood species such as maples and American beech with well-developed lower layers containing many of the canopy species often with the vine component.

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

Model Parameters

Deterministic Transitions

|  |  |  |  |
| --- | --- | --- | --- |
| **From Class** | **Begins at (yr)** | **Succeeds to** | **After (years)** |
| Early1:ALL | 0 | Mid1:CLS | 14 |
| Mid1:CLS | 15 | Late1:CLS | 64 |
| Late1:CLS | 65 | 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 | 0.005 | 200 | Yes | 0 |
| Surface Fire | Early1:ALL | Early1:ALL | 0.033 | 30 | No | 0 |
| Wind or Weather or Stress | Mid1:CLS | Early1:ALL | 0.003 | 333 | Yes | 0 |
| Replacement Fire | Mid1:CLS | Early1:ALL | 0.003 | 333 | Yes | 0 |
| Mixed Fire | Mid1:CLS | Mid1:CLS | 0.01 | 100 | No | 0 |
| Surface Fire | Mid1:CLS | Mid1:CLS | 0.04 | 25 | No | 0 |
| Wind or Weather or Stress | Late1:CLS | Early1:ALL | 0.003 | 333 | Yes | 0 |
| Replacement Fire | Late1:CLS | Early1:ALL | 0.003 | 333 | Yes | 0 |
| Mixed Fire | Late1:CLS | Late1:CLS | 0.01 | 100 | No | 0 |
| Surface Fire | Late1:CLS | Late1:CLS | 0.04 | 25 | No | 0 |

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