

13040

Ozark-Ouachita Dry-Mesic Oak Forest

BpS Model/Description Version: Aug. 2020

Modelers		Reviewers	
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Vegetation Type

Forest and Woodland

Map Zones

32, 43, 44, 49

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. Distribution is nonetheless influenced by local conditions affecting moisture and fertility. Generally, from east to west, that distribution becomes more and more limited in extent and more dependent on very favorable habitat conditions. Drier sites (often oak dominated) represent approximately 75% of the total type whereas <25% of the type is represented as the most mesic sites in the upland landscape. In Missouri, this type is typically on protected slopes and benches overlaying the Gasconade formation or Eminence-Poosi dolomite, though it may be found on exposed lower slopes. In Arkansas, this type is on lower slopes, benches, upper north slopes, and well-drained flats. Soils are well drained, with gravel and boulders of chert, dolomite, or sandstone at or near the soil surface.

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 (*Acer saccharum*), and other hardwood components. More commonly the vegetation is dominated by white oak (*Quercus alba*), red oak (*Quercus rubra*), *Carya tomentosa*, *Nyssa sylvatica*, *Pinus echinata*, *Quercus coccinea*, and *Fraxinus americana*, and other fire-tolerant hardwood species are dominant. Drier sites are generally more open than mesic sites and may have up to 15% pine canopy cover. At these sites, the canopy is open enough to support mixed grasses, sedges, and forbs, but not warm-season grasses (one reviewer questioned this statement). Herbaceous cover is moderate to abundant (20-80% cover) and is often dominated by *Desmodium nudiflorum*, *Amphicarpaea bracteata*, *Cimicifuga racemosa*, *Desmodium glutinosum*, and *Polystichum acrostichoides*.

BpS Dominant and Indicator Species

Symbol	Scientific Name	Common Name
QUAL	<i>Quercus alba</i>	White oak
QURU	<i>Quercus rubra</i>	Northern red oak
CATO	<i>Carya tomentosa</i>	Mokernut hickory
ACRU	<i>Acer rubrum</i>	Red maple
NYSY	<i>Nyssa sylvatica</i>	Blackgum
PIEC2	<i>Pinus echinata</i>	Shortleaf pine

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 10-20yrs, 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. Native ungulate grazing may have played a small role in replacement where buffalo and elk concentrated, but fire generally maintained systems. Drought and moist cycles play a strong role, interacting with both fire and native grazing. Other natural disturbances may include wind, ice, and mortality from insect and disease.

Fire Frequency

Severity	Avg FI	Percent of All Fires	Min FI	Max FI
Replacement	186	6	50	300
Moderate (Mixed)	66	17	20	150
Low (Surface)	15	77	5	35
All Fires	11	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

Topographically complex areas can be relatively small (<1,000ac). Larger landscapes occur up to several thousand acres in size.

Adjacency or Identification Concerns

This BpS is topographically adjacent to the wetter type (BpS 1334) downslope and the drier type (BpS 1364) on ridgetops depending on local conditions affecting moisture, aspect, elevation, and soil productivity.

Issues or Problems

Native Uncharacteristic Conditions

Densification due to fire suppression and timber harvesting. Shift in species composition due to the selection of oak for cutting.

Comments

Succession Classes	
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Mapping Rules

[illegible]

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 - All Structures
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Indicator Species

Symbol	Scientific Name	Common Name	Canopy Position
ACRU	Acer rubrum	Red maple	Upper
QUAL	Quercus alba	White oak	Upper
QURU	Quercus rubra	Northern red oak	Upper
PRSE2	Prunus serotina	Black cherry	Upper
SAAL5	Sassafras albidum	Sassafras	Mid

Description

Sprouts, seedlings, 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.

Maximum Tree Size Class

Sapling >4.5ft; <5" DBH

Class B	21	Mid Development 1 - Closed
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Indicator Species

Symbol	Scientific Name	Common Name	Canopy Position
ACRU	Acer rubrum	Red maple	lower
ACSA3	Acer saccharum	Sugar maple	Upper
QUAL	Quercus alba	White oak	Upper
QURU	Quecus rubra	Northern red oak	Upper

Description

Dominated by young to mid-seral species with some development of mid- and understory species. Closed-canopy conditions are a function of mesic (or topographically protected) conditions. Understory/mid-story development with at least two layers present (dependent on age) on these more mesic sites. On drier sites, forested-to-woodland conditions are interspersed, but with a relatively open understory.

Maximum Tree Size Class

Pole 5-9" DBH

Class C	22	Mid Development 1 - Open
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Indicator Species

Symbol	Scientific Name	Common Name	Canopy Position
QUAL	Quercus alba	White oak	Upper
QURU	Quercus rubra	Northern red oak	Upper
ACRU	Acer rubrum	Red maple	Upper

Description

Similar overstory species as Class B but in a single-canopy structure without well-developed mid story. On drier sites, generally more oak dominated. Variable herbaceous understory ranging from grass to rich herbaceous layers. The understory is a function of moisture gradients, and fire frequency and intensity.

Maximum Tree Size Class

Pole 5-9" DBH

Class D	33	Late Development 1 - Open
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Indicator Species

Symbol	Scientific Name	Common Name	Canopy Position
QUAL	Quercus alba	White oak	Upper
QURU	Quercus rubra	Northern red oak	Upper
OSVI	Ostrya virginiana	Hophornbeam	Mid
CACA1 8	Carpinus caroliniana	American hornbeam	Mid

Mature canopy sometimes reaching 100ft in height. Dominant overstory species variable by location and stand history. Open (woodland) conditions dependent on fire frequency and intensity. Generally more oak dominated, with white oak a common dominant.

Medium 9-21" DBH

Indicator Species

Canopy may have more non-oak hardwoods such as blackgum, red maple, American beech, and dogwood with well-developed lower layers containing many of the canopy species.

Medium 9-21"DBH

Deterministic Transitions

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
Alternative Succession	Early1:ALL	Mid1:CLS	1	1	Yes	10
Replacement Fire	Early1:ALL	Early1:ALL	0.025	40	Yes	0
Surface Fire	Early1:ALL	Early1:ALL	0.04	25	No	0
Alternative Succession	Mid1:OPN	Mid1:CLS	1	1	Yes	20
Wind or Weather or Stress	Mid1:OPN	Early1:ALL	0.004	250	Yes	0

Replacement Fire	Mid1:OPN	Early1:ALL	0.004	250	Yes	0
Mixed Fire	Mid1:OPN	Mid1:OPN	0.01	100	No	0
Surface Fire	Mid1:OPN	Mid1:OPN	0.1	10	No	0
Wind or Weather or Stress	Mid1:CLS	Early1:ALL	0.004	250	Yes	0
Replacement Fire	Mid1:CLS	Early1:ALL	0.004	250	Yes	0
Mixed Fire	Mid1:CLS	Mid1:OPN	0.025	40	Yes	0
Surface Fire	Mid1:CLS	Mid1:CLS	0.025	40	No	0
Alternative Succession	Late1:OPN	Late1:CLS	1	1	Yes	20
Wind or Weather or Stress	Late1:OPN	Early1:ALL	0.004	250	Yes	0
Replacement Fire	Late1:OPN	Early1:ALL	0.004	250	Yes	0
Mixed Fire	Late1:OPN	Late1:OPN	0.01	100	No	0
Surface Fire	Late1:OPN	Late1:OPN	0.1	10	No	0
Wind or Weather or Stress	Late1:CLS	Early1:ALL	0.004	250	Yes	0
Replacement Fire	Late1:CLS	Early1:ALL	0.004	250	Yes	0
Mixed Fire	Late1:CLS	Late1:OPN	0.025	40	Yes	0
Surface Fire	Late1:CLS	Late1:CLS	0.025	40	No	0

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