

## Ecological site R119XY050OK Loamy Bottomland

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### General information

**Provisional.** A provisional ecological site description has undergone quality control and quality assurance review. It contains a working state and transition model and enough information to identify the ecological site.



Figure 1. Mapped extent

Areas shown in blue indicate the maximum mapped extent of this ecological site. Other ecological sites likely occur within the highlighted areas. It is also possible for this ecological site to occur outside of highlighted areas if detailed soil survey has not been completed or recently updated.

### MLRA notes

Major Land Resource Area (MLRA): 119X–Ouachita Mountains

This ecological site is found in MLRA 119: Ouachita Mountains.

This area is in the Ouachita Mountains Section of the Ouachita Province of the Interior Highlands. The steep mountains are underlain by folded and faulted sedimentary and metamorphic rocks. Most of the stream valleys are narrow and have steep gradients, but wide terraces and flood plains border the Ouachita River in western Arkansas. Elevation ranges from 330 feet (100 meters) on the lowest valley floors to 2,625 feet (800 meters) on the highest mountain peaks. Local relief is generally 100 to 200 feet (30 to 60 meters), but it can exceed 980 feet (300 meters).

### Classification relationships

South-Central Interior Large Floodplain

Summary: This floodplain system is found in the Interior Highlands as far west as eastern Oklahoma, as well as throughout the Interior Low Plateau, Cumberland, Southern Ridge and Valley, and Western Allegheny Plateau, and lower elevations of the Southern Blue Ridge. Examples occur along large rivers or streams where topography and alluvial processes have resulted in a well-developed floodplain. A single occurrence may extend from river's edge across the outermost extent of the floodplain or to where it meets a wet meadow or upland system. Many examples of this system will contain well-drained levees, terraces and stabilized bars, and some will include herbaceous sloughs and shrub wetlands resulting, in part, from beaver activity. A variety of soil types may be found within the floodplain from very well-drained sandy substrates to very dense clays. It is this variety of substrates in combination

with different flooding regimes that creates the mix of vegetation. Most areas, except for the montane alluvial forests, are inundated at some point each spring; microtopography determines how long the various habitats are inundated. Although vegetation is quite variable in this broadly defined system, examples may include *Acer saccharinum*, *Platanus occidentalis*, *Liquidambar styraciflua*, and *Quercus* spp. Understory species are mixed, but include shrubs, such as *Cephalanthus occidentalis* and *Arundinaria gigantea* ssp. *gigantea*, and sedges (*Carex* spp.). This system likely floods at least once annually and can be altered by occasional severe floods. Impoundments and conversion to agriculture can also impact this system.

## Ecological site concept

This site is on 0 to 3 percent slopes on bottom land positions. it has loamy soils with varying degrees of flooding.

Table 1. Dominant plant species

Tree	Not specified
Shrub	Not specified
Herbaceous	Not specified

## Physiographic features

This site in on 0 to 3 percent slopes on flood-plains, steps and terraces.

Table 2. Representative physiographic features

Landforms	(1) Flood plain (2) Flood-plain step (3) Terrace
Flooding duration	Brief (2 to 7 days)
Flooding frequency	None to frequent
Ponding frequency	None
Elevation	60–608 m
Slope	0–3%
Ponding depth	0 cm
Water table depth	0–122 cm
Aspect	Aspect is not a significant factor

## Climatic features

Table 3. Representative climatic features

Frost-free period (average)	194 days
Freeze-free period (average)	223 days
Precipitation total (average)	1,448 mm

## Climate stations used

- (1) BATTIEST [USC00340567], Bethel, OK
- (2) TUSKAHOMA [USC00349023], Tuskahoma, OK
- (3) HOT SPRINGS ASOS [USW00003962], Donaldson, AR
- (4) MT IDA 3 SE [USC00034988], Mount Ida, AR

## Influencing water features

this site is influenced by flooding and high water tables.

## Soil features

The soil series associated with this site are: Verdigris, Toine, Speer, Spadra, Rexor, Neff, Kenn, Dela, Cupco. They are very deep, Very poorly drained to Well drained, and Moderately slow to Moderately rapid permeable soils, with very acidic to slightly acidic soil reaction, that formed in alluvium.

**Table 4. Representative soil features**

Surface texture	(1) Cobbly loam (2) Gravelly very fine sandy loam (3) Loam
Family particle size	(1) Loamy
Drainage class	Poorly drained to well drained
Permeability class	Moderately slow to moderately rapid
Soil depth	203 cm
Surface fragment cover <=3"	0–7%
Surface fragment cover >3"	0–7%
Available water capacity (0-101.6cm)	9.91–20.07 cm
Calcium carbonate equivalent (0-101.6cm)	0%
Electrical conductivity (0-101.6cm)	0 mmhos/cm
Sodium adsorption ratio (0-101.6cm)	0
Soil reaction (1:1 water) (0-101.6cm)	5–6.2
Subsurface fragment volume <=3" (Depth not specified)	1–30%
Subsurface fragment volume >3" (Depth not specified)	0–16%

## Ecological dynamics

Information contained in this section was adapted from Missouri ESD. The information presented is representative of very complex vegetation communities. Key indicator plants, animals and ecological processes are described to help inform land management decisions. Plant communities will differ across the MLRA because of the naturally occurring variability in weather, soils, and aspect. The Reference Plant Community is not necessarily the management goal. The species lists are representative and are not botanical descriptions of all species occurring, or potentially occurring, on this site. They are not intended to cover every situation or the full range of conditions, species, and responses for the site.

The reference community is characterized as a savanna unit dominated by big bluestem and a wide variety of prairie wildflowers while other species added to the mix of upland drainageway prairie species. Slightly higher areas within or at the edge of the ecological site supported a savanna with scattered pin oak and willow.

This ecological site occurs at the base of slopes below upland prairies and woodlands, or as high, isolated terraces surrounded by floodplain forest. The higher position and loamy soil texture created a better drainage situation. Consequently, the site is less wet than adjacent sites. These areas occasionally flooded.

Fire also played a key role in maintaining this ecological site, likely occurring at least once every 3 years. Fire removed dead plant litter and provided room for a lush growth of prairie vegetation. Fire also controlled woody species. During fire free intervals woody species would have increased in abundance and spread out onto the main prairie. Grazing by native large herbivores, such deer furthermore impacted these sites. Their activities altered the composition, fuel loads and structure of the vegetation, adding to the diversity of structure and composition.

These sites are very productive. Today, Loamy Bottomlands are nearly extirpated from the region as the former terrace prairies and savannas have been converted to intensive agriculture. Few quality remnants exist. While re-establishing prairie and savanna on converted agriculture sites is beneficial to wildlife, restoration to the reference state from agricultural land is a long term proposition with uncertain outcomes.

A State and Transition Diagram is depicted in Figure 1. Detailed descriptions of each state, transition, plant community, and pathway follow the model. This model is based on available experimental research, field observations, professional consensus, and interpretations. It is likely to change as knowledge increases.

## State and transition model

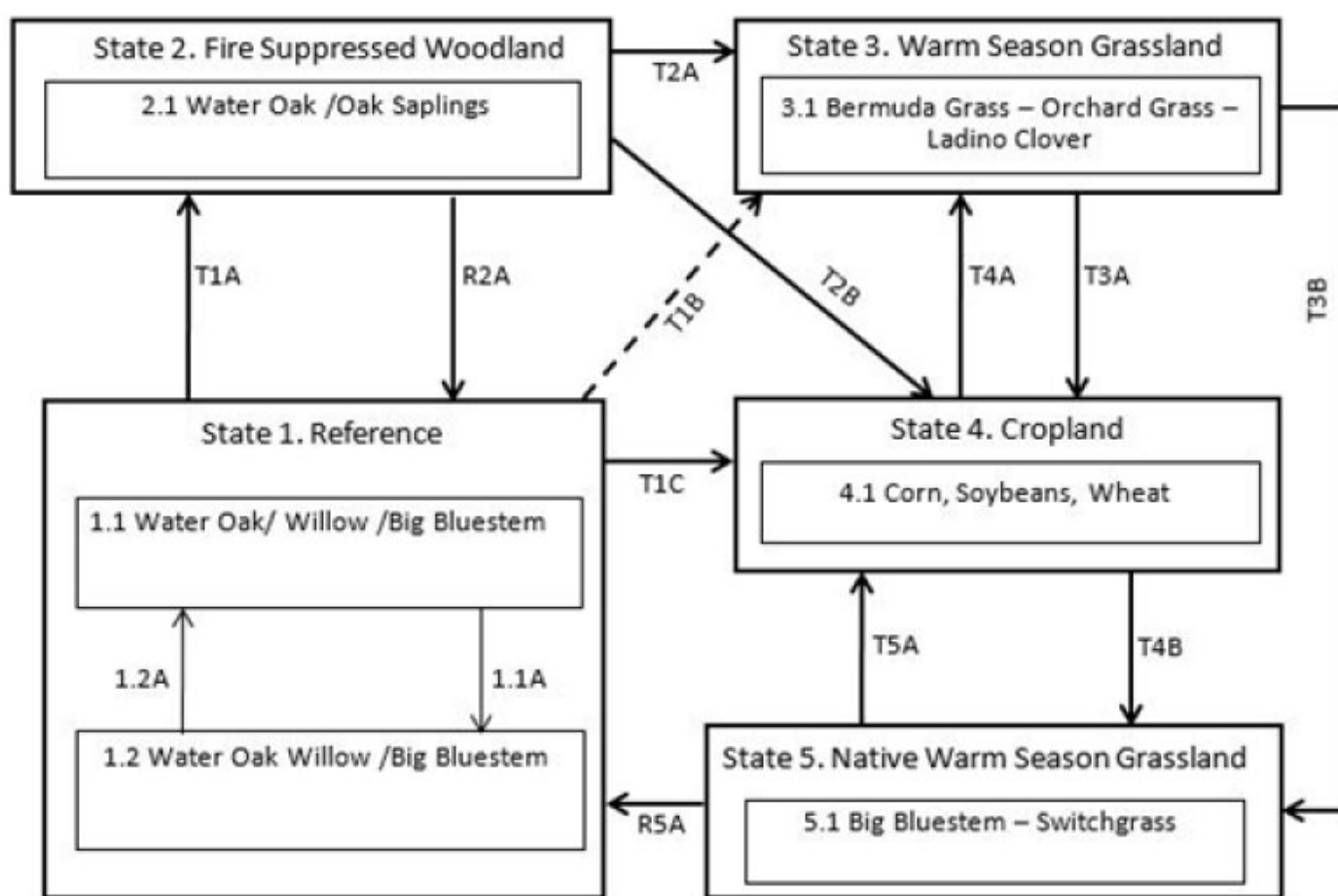


Figure 6. R119XY050OK, Loamy Bottomland

Code	Event/Activity/Process
T1A	Fire suppression > 20 years; woody invasion
T1B	Tillage; vegetative seeding; grassland management
T1C, T3A, T5A	Tillage; conservation cropping system
T2A	Woody removal; tillage; vegetative seeding; grassland management
T2B	Woody removal; tillage; conservation cropping system
T4A	Vegetative seeding ; grassland management
T3B, T4B	Vegetative seeding; prescribed fire; grassland management
1.1A	Fire-free interval 10+ years
1.2A	Fire interval 2-5 years
R2A	Thinning; prescribed fire 2-5 years
R5A	Vegetative seeding; prescribed fire 2-5 years; tree planting; long rotation

Figure 7. R119XY050OK, Loamy Bottomland

## State 1 Reference

This state is native oak savanna dominated by big bluestem and a wide variety of prairie forbs. This state occurs on level to gently sloping soils. Willow occurred in small groves or as scattered individuals across the landscape. Two phases can occur that will transition back and forth depending on fire frequencies. Longer fire free intervals will allow woody species to increase such as oaks, prairie willow, dogwoods and wild plum. When fire intervals shorten these woody species will decrease. This state is very rare. Nearly all former reference states have been converted to cool season grassland and intensive agriculture cropland. Small acres remain in a fire suppressed woodland community.

## Other references

NatureServe. 2015. NatureServe Explorer: An online encyclopedia of life [web application]. Version 7.1. NatureServe, Arlington, Virginia.  
Available <http://explorer.natureserve.org>. (Accessed: October 27, 2015).

Official Soil Survey, USDA-NRCS: <https://soilseries.sc.egov.usda.gov/osdname.asp>

Landfire: <http://www.landfire.gov> 2015 data

United States Department of Agriculture Handbook 296: Land Resource Regions and Major Land Resource Areas of the United States, the Caribbean, and the Pacific Basin

NASIS database 2016 NASIS Client Version Number 6.4.1 and database model 7.2.5

## Contributors

Kevin Godsey

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Doug Wallace and Fred Young at Missouri NRCS State office, personal communication and sharing of state and transition models.

## Rangeland health reference sheet

Interpreting Indicators of Rangeland Health is a qualitative assessment protocol used to determine ecosystem condition based on benchmark characteristics described in the Reference Sheet. A suite of 17 (or more) indicators are typically considered in an assessment. The ecological site(s) representative of an assessment location must be known prior to applying the protocol and must be verified based on soils and climate. Current plant community cannot be used to identify the ecological site.

Author(s)/participant(s)	
Contact for lead author	
Date	
Approved by	
Approval date	
Composition (Indicators 10 and 12) based on	Annual Production

### Indicators

1. **Number and extent of rills:**

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2. **Presence of water flow patterns:**

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3. **Number and height of erosional pedestals or terracettes:**

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4. **Bare ground from Ecological Site Description or other studies (rock, litter, lichen, moss, plant canopy are not bare ground):**

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5. **Number of gullies and erosion associated with gullies:**

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6. **Extent of wind scoured, blowouts and/or depositional areas:**

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7. **Amount of litter movement (describe size and distance expected to travel):**

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8. **Soil surface (top few mm) resistance to erosion (stability values are averages - most sites will show a range of values):**

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9. **Soil surface structure and SOM content (include type of structure and A-horizon color and thickness):**

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10. **Effect of community phase composition (relative proportion of different functional groups) and spatial**

distribution on infiltration and runoff:

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11. **Presence and thickness of compaction layer (usually none; describe soil profile features which may be mistaken for compaction on this site):**
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12. **Functional/Structural Groups (list in order of descending dominance by above-ground annual-production or live foliar cover using symbols: >>, >, = to indicate much greater than, greater than, and equal to):**

Dominant:

Sub-dominant:

Other:

Additional:

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13. **Amount of plant mortality and decadence (include which functional groups are expected to show mortality or decadence):**
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14. **Average percent litter cover (%) and depth ( in):**
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15. **Expected annual annual-production (this is TOTAL above-ground annual-production, not just forage annual-production):**
- 

16. **Potential invasive (including noxious) species (native and non-native). List species which BOTH characterize degraded states and have the potential to become a dominant or co-dominant species on the ecological site if their future establishment and growth is not actively controlled by management interventions. Species that become dominant for only one to several years (e.g., short-term response to drought or wildfire) are not invasive plants. Note that unlike other indicators, we are describing what is NOT expected in the reference state for the ecological site:**
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17. **Perennial plant reproductive capability:**
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