USDA Natural Resources Conservation Service

Ecological site R119XY088OK
Shallow Savannah

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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.

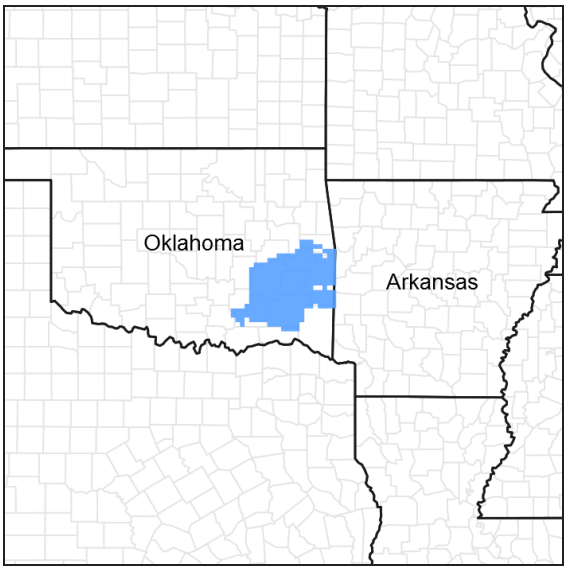

Figure 1. Mapped extent

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

Ozark-Ouachita Shortleaf Pine-Bluestem
Summary: This system represents woodlands of the Ouachita and Ozark mountains region of Arkansas, adjacent Oklahoma, and southern Missouri in which Pinus echinata is the canopy dominant, and the understory is characterized by Andropogon gerardii, Schizachyrium scoparium, and other prairie plants. Although examples of this system occur throughout this region, there is local variation in the extent to which they were present. The center of distribution is the northern and western Ouachita Mountains, and it is best developed in large, dry, and flat to gently undulating portions of the landscape which carry fire well, creating extensive natural fire compartments. In the Ouachitas, the system occurs on the northern Hogback Ridges excluding the Novaculite areas to the south. These are large, gently sloping, east/west-trending ridges of sandstone and shale, the south-facing slopes of which

constitute large fire compartments. In nearly all examples, Pinus echinata occurs with a variable mixture of hardwood species. The exact composition of the hardwoods is much more closely related to aspect and topographic factors than is the pine component. In the Ozark Highlands this system is less extensive but was historically prominent where sandstone-derived soils are common. In Missouri and Oklahoma, this system occurs on gently dissected upland cherty plains (in addition to sandstone ridges).

Ecological site concept

This site is found on backslopes of upland with udic moisture and thermic temperature regimes. it has shallow loamy soils over sandstone bedrock with low available water.

Table 1. Dominant plant species

Tree	Not specified
Shrub	Not specified
Herbaceous	Not specified

Physiographic features

This site is on 3 to 30 percent back slopes and shoulders of hill and mountainsides.

Table 2. Representative physiographic features

Landforms	(1) Hill (2) Mountain
Flooding frequency	None
Ponding frequency	None
Elevation	298–2,400 ft
Slope	3–30%
Ponding depth	0 in
Water table depth	9 in
Aspect	SE

Climatic features

Table 3. Representative climatic features

Frost-free period (average)	186 days
Freeze-free period (average)	209 days
Precipitation total (average)	54 in

Climate stations used

- (1) TUSKAHOMA [USC00349023], Tuskahoma, OK
- (2) WILBURTON 9 ENE [USC00349634], Red Oak, OK
- (3) BATTIEST [USC00340567], Bethel, OK

Influencing water features

This ecological site is not influenced by wetland or riparian water features.

Soil features

The soil series associated with this site are: Tuskahoma, Hector, Clebit. They are very shallow to shallow, Moderately well drained to Well drained, and Very slow to Moderately rapid permeable soils, with very acidic to slighlty acidic soil reaction, that formed in Residuum from sandstone and shale.

Table 4. Representative soil features

Parent material	(1) Residuum–sandstone and shale
Surface texture	(1) Very gravelly fine sandy loam (2) Stony loam (3) Very stony
Family particle size	(1) Loamy
Drainage class	Moderately well drained to well drained
Permeability class	Very slow to moderately rapid
Soil depth	10–18 in
Surface fragment cover <=3"	0–2%
Surface fragment cover >3"	2%
Available water capacity (0-40in)	0.6–2.6 in
Calcium carbonate equivalent (0-40in)	0%
Electrical conductivity (0-40in)	0 mmhos/cm
Sodium adsorption ratio (0-40in)	0
Soil reaction (1:1 water) (0-40in)	5–6.7
Subsurface fragment volume <=3" (Depth not specified)	3–33%
Subsurface fragment volume >3" (Depth not specified)	1–18%

Ecological dynamics

The assumed historic plant community for this site is a mixture of tall grasses, perennial forbs, and scattered trees. The major grass species include Indiangrass, Switchgrass, Big bluestem, Broomsage bluestem, and Little Bluestem. Tree species include Shortleaf Pine, various Oaks, Hickories, Gums, Maples, and Elms. The variety of species on this site make it excellent habitat for quail, deer, and turkey. Most of the native grass species are good for livestock grazing unless the fields have been overgrazed.

All sites in this region developed under a fire/grazing interaction ecology. Large herbivores grazed the grasslands, especially following burns, and then moved on seeking fresh forage. Wild fires played a major role in the development and maintenance of the tall grasses. They kept the woody species suppressed. Recovery of grasses took place naturally because a sufficient time normally passed before the animals returned to the area again. Prescribed grazing techniques can simulate this natural process. In the total absence of fire, shrubs tend to increase slowly. Overgrazing the site will also increase the amount of woody species and increase the weed population. When this site is in a good ecological condition it will produce plenty of fuel for using prescribed burns to suppress woody vegetation. The site can be influenced toward the historic plant community by using planned rest periods on grazing and prescribed burning. The application of herbicides to control brush can produce similar results.

Continuous overgrazing or a summer wild fire can change the site to less palatable mid-grasses and weeds. This can be beneficial to some wildlife especially quail. However this greatly reduces the productivity for livestock

grazing. Deer and turkey respond to an increase in diversity of vegetation.

Ecological processes such as the nutrient cycle and the hydrological cycle are enhanced by the maintenance of a diverse, higher producing plant community.

State and transition model

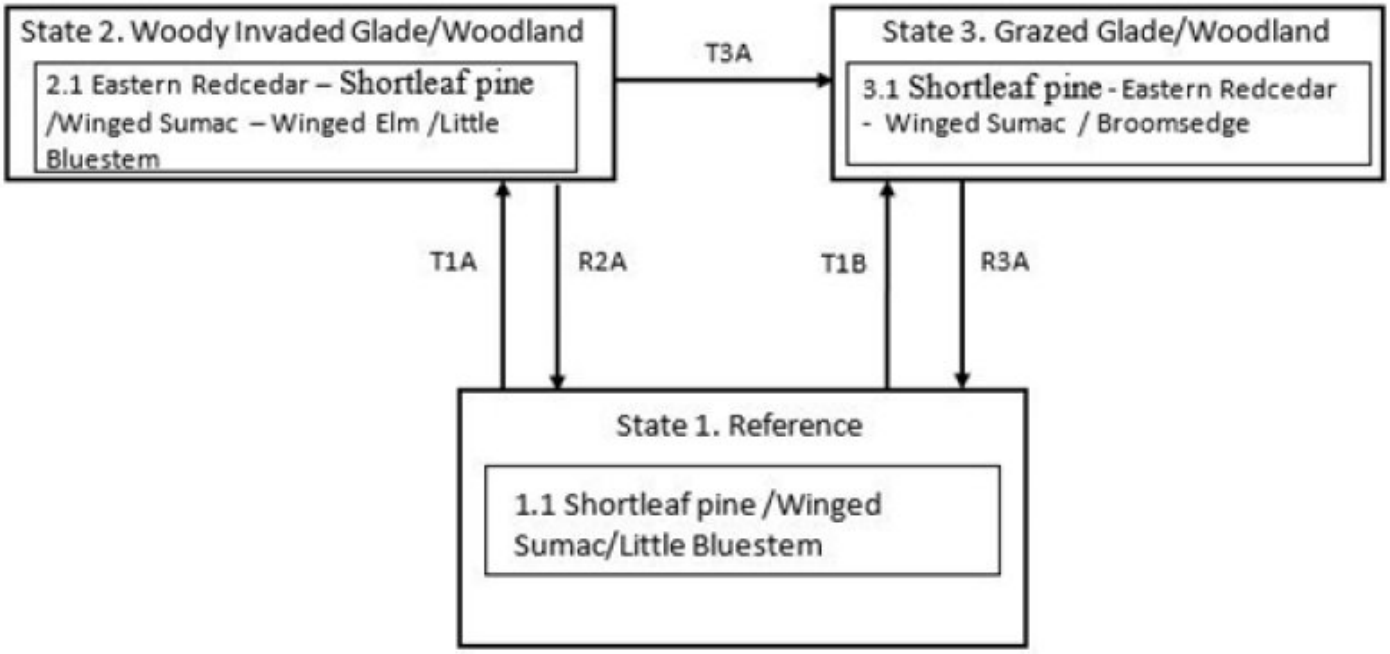

Figure 6. R119XY088OK, Shallow Savannah

Code	Event/Activity
T1A	Fire suppression (> 20 years)
T1B	Uncontrolled grazing; fire suppression
T3A	Uncontrolled grazing
R2A	Cedar removal; prescribed fire
R3A	Grazing exclusion; prescribed fire; woody removal

Figure 7. R119XY088OK, Shallow Savannah

State 1
Reference

The historic Shallow Savannah reference site harbors a wide diversity of plants and animals. Many, like little bluestem and Indian grass are also found on prairies. The savannah complexes range from wide open grassy areas with shallower soil profiles and bare bedrock, to areas with widely scattered blackjack and post oaks on locations with soil depths at the deeper extreme of the range for this soil component. On protected slopes, open woodlands are more common. Here the deeper soil depth range for this soil component and protected aspects allow more woody components to dominate. While many have suffered from grazing and fire suppression, good examples can still be found.

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

Mike Barrick, NRCS
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Acknowledgments

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):

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

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

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

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

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

10. **Effect of community phase composition (relative proportion of different functional groups) and spatial distribution on infiltration and runoff:**

11. **Presence and thickness of compaction layer (usually none; describe soil profile features which may be mistaken for compaction on this site):**

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:

13. **Amount of plant mortality and decadence (include which functional groups are expected to show mortality or decadence):**

14. **Average percent litter cover (%) and depth (in):**

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:**

17. **Perennial plant reproductive capability:**