

# Ecological site F119XY002AR Loamy Hard Sandstone Upland

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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.

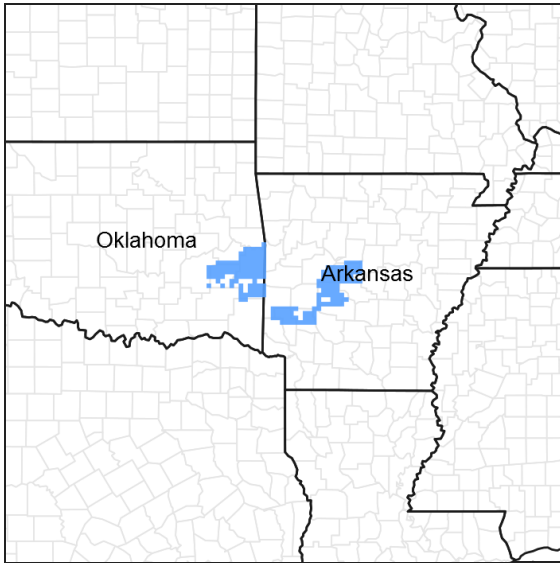


Figure 1. Mapped extent

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

NatureServe area: Ozark-Ouachita Shortleaf Pine-Oak Forest and Woodland.

Summary: This system represents forests and woodlands of the Ouachita and Ozark mountains region of Arkansas, adjacent Oklahoma, and southern Missouri in which *Pinus echinata* is an important or dominant component.

Although examples of this system occur throughout this region, there is local variation in the extent to which they were present. For example, in the Ozark Highlands, this system was historically prominent only in the southeastern part where sandstone-derived soils were common, and in the southern part on soils derived from chert, being excluded from or diminished in other areas by non-conductive soils. In contrast, pine was virtually ubiquitous in the historical forests of the Ouachitas. In nearly all cases (at least in the Ouachitas), *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 some examples of this system, the aggregate importance of hardwoods may be greater than pine, especially on subxeric and mesic sites

## Ecological site concept

This site is a Shortleaf Pine and Oak woodland on slopes less than 20 percent with udic moisture and thermic temperature regimes. It has loamy soils over sandstone bedrock greater than 20 inches deep with greater than 3 inches of Available water.

**Table 1. Dominant plant species**

Tree	(1) <i>Pinus echinata</i>
Shrub	Not specified
Herbaceous	(1) <i>Andropogon</i>

## Physiographic features

Geology: Sandstone

Landform/Landscape Position: Upland hills with slopes less than 20 percent

Edaphic: Loamy moderately deep acidic soils

Vegetation Dynamics: Shortleaf Pine and Oak woodland

**Table 2. Representative physiographic features**

Landforms	(1) Hill
Flooding frequency	None
Ponding frequency	None to rare
Elevation	183–823 m
Slope	1–20%
Aspect	SE

## Climatic features

**Table 3. Representative climatic features**

Frost-free period (average)	196 days
Freeze-free period (average)	223 days
Precipitation total (average)	1,422 mm

## Climate stations used

- (1) NIMROD DAM [USC00035200], Perryville, AR
- (2) TUSKAHOMA [USC00349023], Tuskahoma, OK
- (3) MC CURTAIN 1 SE [USC00345693], McCurtain, OK
- (4) WILBURTON 9 ENE [USC00349634], Red Oak, OK
- (5) BIG FORK 1 SSE [USC00030664], Mena, AR
- (6) MT IDA 3 SE [USC00034988], Mount Ida, AR
- (7) ALUM FORK [USC00030130], Paron, AR
- (8) HOT SPRINGS ASOS [USW00003962], Donaldson, AR

## Influencing water features

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

## Soil features

These soils have acidic. The soils were formed under woodland vegetation, and have thin, light-colored surface horizons. Parent material is residuum weathered from sandstone. These soils are not affected by seasonal wetness. Soil series associated with this site include Pirum.

**Table 4. Representative soil features**

Parent material	(1) Residuum–sandstone
Surface texture	(1) Cobbly fine sandy loam (2) Gravelly loam (3) Stony
Family particle size	(1) Loamy
Drainage class	Well drained
Permeability class	Moderately slow to moderately rapid
Soil depth	56–107 cm
Surface fragment cover <=3"	0%
Surface fragment cover >3"	0%
Available water capacity (0-101.6cm)	9.65–14.48 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
Subsurface fragment volume <=3" (Depth not specified)	2–20%
Subsurface fragment volume >3" (Depth not specified)	0–19%

## Ecological dynamics

### State and transition model

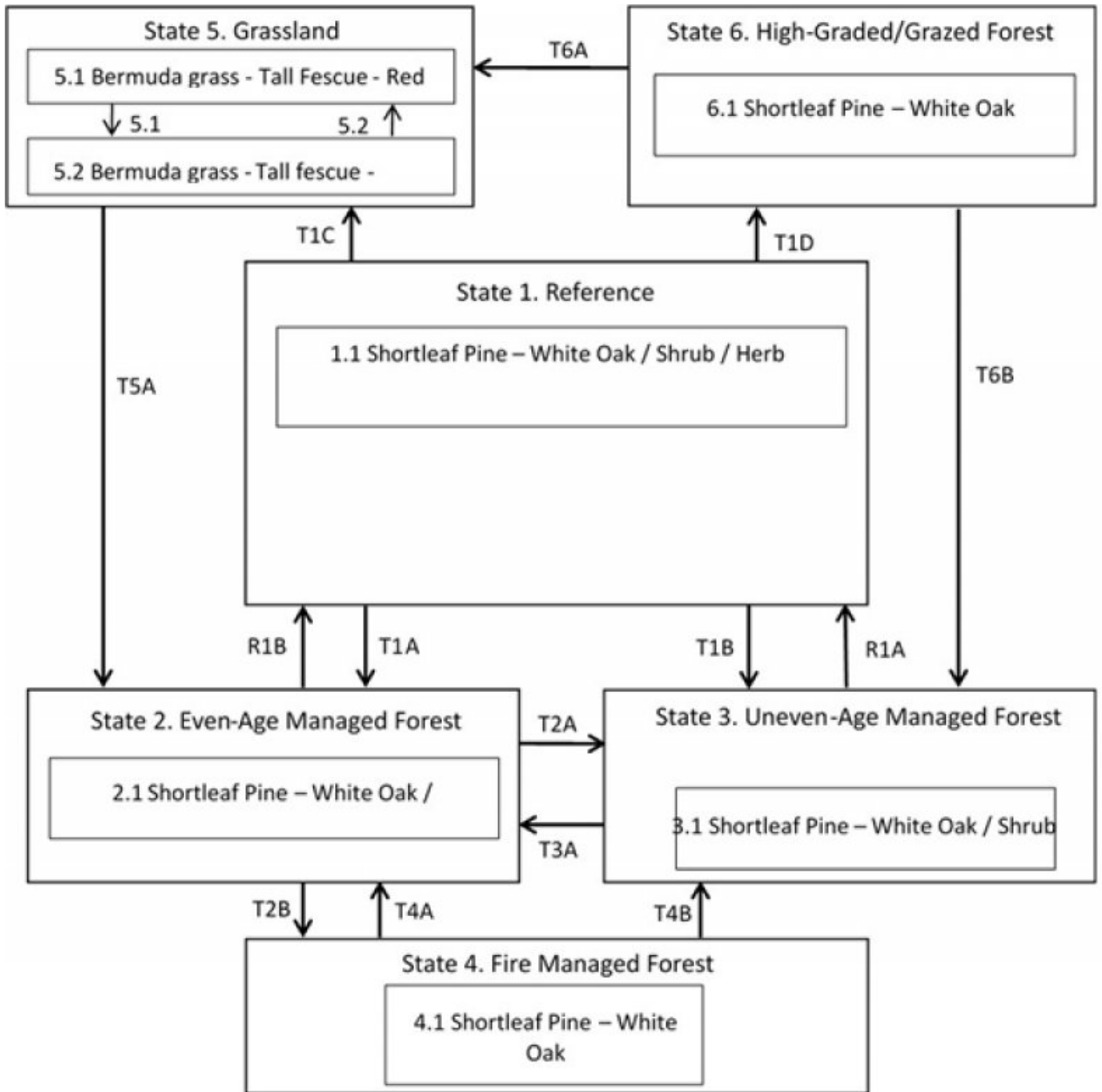


Figure 6. F119XY002AR, Loamy Hard Sandstone Upland

Code	Event/Process
T1A	Even-aged management
T1B	Fire suppression; uneven-age management
T2B	Prescribed fire; thinning; grazing management
T1C, T6A	Clearing & pasture planting
T1D	Poorly planned harvest & uncontrolled grazing
T2A	Uneven-age management
T3A	Even-age management
T5A	Tree planting; long-term succession; no grazing
T6B	Uneven-age management; no grazing
T4A	Uneven-age management; no grazing
T4B	Even-age management; no grazing
Code	Event/Process
5.1A	Over grazing; no fertilization
5.2A	Brush management; grassland seeding; grassland management
Code	Event/Process
R1A	Prescribed fire & extended rotations
R1B	Uneven-age mgt, extended rotations

Figure 7. F119XY002AR, Loamy Hard Sandstone Upland

## State 1

### Reference state

The historical reference state for this ecological site was old growth Forest. Periodic disturbances from fire, wind or ice maintained the woodland structure and diverse ground flora species. Long disturbance-free periods allowed an increase in both the density of trees and the abundance of shade tolerant species. Reference states have been subject to repeated, high-graded timber harvest coupled with domestic livestock grazing (State 6). Fire suppression has resulted in increased canopy density, which has affected the abundance and diversity of ground flora. Many reference states have been managed for timber harvest, resulting in either even-age (State 2) or uneven-age (State 3) woodlands.

### 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

## 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):**

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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):**
- 
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:**
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17. **Perennial plant reproductive capability:**
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