

Ecological site F119XY023AR Loamy Shallow Backslope

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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 Woodland

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 on > 15 percent slopes on backslopes with udic moisture and thermic temperature regimes. it has shallow loamy soils with low available water.

Table 1. Dominant plant species

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

Physiographic features

This site is on 8 to 60 percent back slopes of hill sides.

Table 2. Representative physiographic features

Landforms	(1) Hill (2) Mountain slope
Flooding frequency	None
Ponding frequency	None
Elevation	91–608 m
Slope	8–60%
Ponding depth	0 cm
Aspect	SE

Climatic features

Table 3. Representative climatic features

Frost-free period (average)	191 days
Freeze-free period (average)	213 days
Precipitation total (average)	1,422 mm

Climate stations used

- (1) MT IDA 3 SE [USC00034988], Mount Ida, AR
- (2) NIMROD DAM [USC00035200], Perryville, AR
- (3) TUSKAHOMA [USC00349023], Tuskahoma, OK
- (4) WILBURTON 9 ENE [USC00349634], Red Oak, OK
- (5) BLAKELY MTN DAM [USC00030764], Mountain Pine, AR
- (6) 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: Clebit and Bismarck. They are shallow, Well drained to Somewhat excessively drained, and Moderate to Moderately rapid permeable soils, with strongly acidic to strongly acidic soil reaction, that formed in Residuum from Acid shale, Sandstone.

Table 4. Representative soil features

Parent material	(1) Residuum—sandstone and shale
Surface texture	(1) Very gravelly fine sandy loam (2) Very stony loam (3) Boulderly silt loam
Family particle size	(1) Loamy
Drainage class	Well drained to somewhat excessively drained
Permeability class	Moderate to moderately rapid
Soil depth	28–51 cm
Surface fragment cover ≤3"	0–30%
Surface fragment cover >3"	9–30%
Available water capacity (0-101.6cm)	2.03–5.33 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)	5.3–5.5
Subsurface fragment volume ≤3" (Depth not specified)	0–40%
Subsurface fragment volume >3" (Depth not specified)	1–75%

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.

Loamy Shallow Back slopes harbor a wide diversity of lichens, plants and animals. The dominant grasses include little bluestem, broom sedge. The glade/woodland complexes range from wide open grassy areas with very shallow soils and bare bedrock, to areas with widely scattered blackjack oaks on slightly deeper soils and more protected slopes.

The shallow soils of the limit the growth and abundance of trees and support the native grasses and forbs that dominate these systems. Trees found on and near glades are often stunted and express poor development because of shallow droughty soils and poor growing conditions. Like the adjacent prairies, fire also played an important role in the maintenance of these systems. These systems typically burned at least once every three

years.

These periodic fires removed the litter and stimulated the growth and flowering of the grasses and forbs. They also further limited the growth and dominance of trees. Fire tolerant blackjack oak occupied islands and edges of deeper soils, creating a complex mosaic of open glade and low-density woodland.

During fire-free intervals, woody species increased, especially on protected slopes. Once established, blackjack oak eastern red cedar and sumac can quickly fill in a glade/woodland system, especially if grazing has diminished the vigor of the diverse flora.

Many glades have been heavily grazed and suffer substantial woody invasion. Removal of the woodies and the application of prescribed fire have proven to be effective management tools.

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

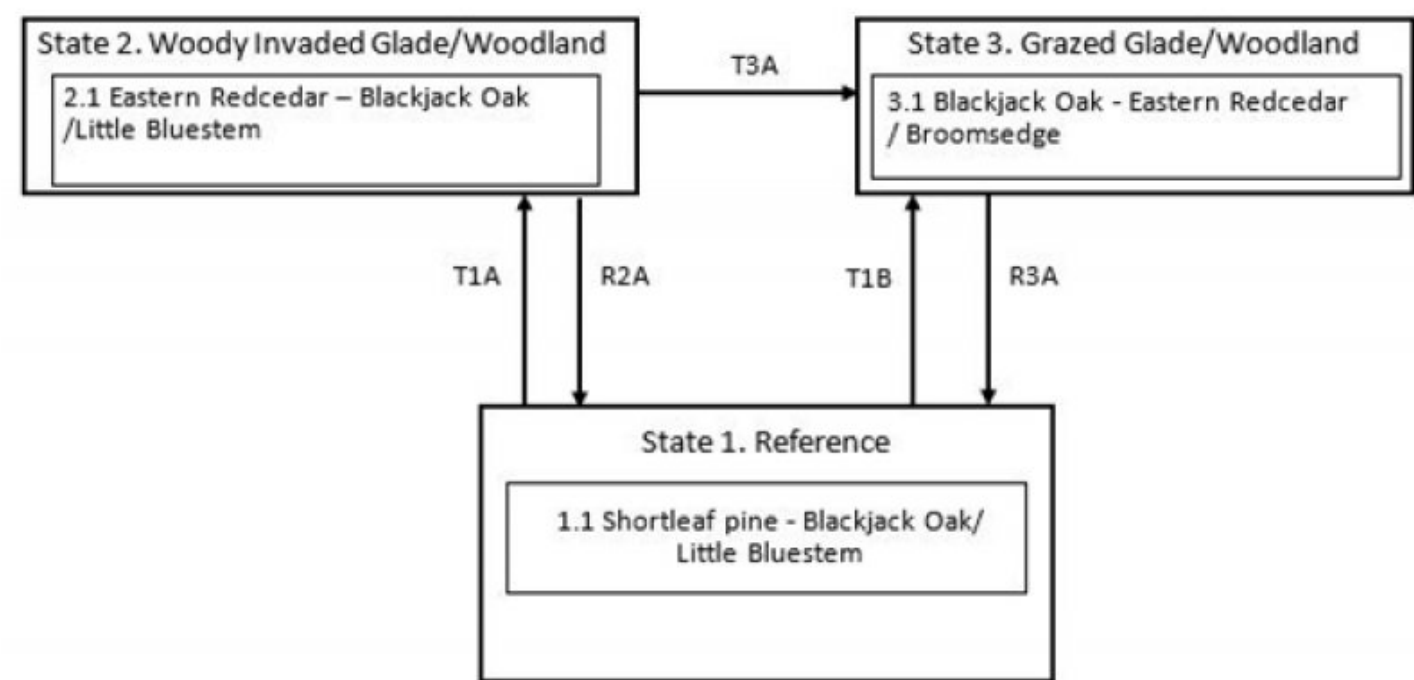


Figure 6. F119XY023AR, Loamy Shallow Backslope

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. F119XY023AR, Loamy Shallow Backslope

State 1 Reference

The historic Loamy Shallow Back slope reference site harbors a wide diversity of plants and animals. Many, like little bluestem, Indian grass, are also found on prairies. The glade/woodland 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

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:

-
2. **Presence of water flow patterns:**
-
3. **Number and height of erosional pedestals or terracettes:**
-
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:**
