

# Ecological site F119XY030AR

## Rubbly Backslope

Accessed: 09/01/2026

### 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.

### 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 Dry-Mesic Oak Forest Summary: This system is found throughout the Ozark and Ouachita Highlands ranging to the western edge of the Interior Low Plateau. It is the matrix system of this region and occurs on dry-mesic to mesic, gentle to moderately steep slopes. Soils are typically moderately to well-drained and more fertile than those associated with oak woodlands. A closed canopy of oak species (*Quercus rubra* and *Quercus alba*) often associated with hickory species (*Carya* spp.) typifies this system. *Acer saccharum* (or *Acer barbatum* to the south) may occur on more mesic examples of this system. Wind, drought, lightning, and occasional fires can influence this system.

### Ecological site concept

This site is on greater than 15 percent rubbly backslopes with udic moisture and thermic temperature regimes. It has loamy soils with greater than 3 inches of available water.

Table 1. Dominant plant species

|            |                         |
|------------|-------------------------|
| Tree       | (1) <i>Quercus alba</i> |
| Shrub      | Not specified           |
| Herbaceous | (1) <i>Desmodium</i>    |

### Physiographic features

This site is on 3 to 60 percent rubbly back slopes of hill and mountainsides.

Table 2. Representative physiographic features

|           |                                |
|-----------|--------------------------------|
| Landforms | (1) Hill<br>(2) Mountain slope |
|-----------|--------------------------------|

|                    |              |
|--------------------|--------------|
| Flooding frequency | None         |
| Ponding frequency  | None         |
| Elevation          | 150 – 670 m  |
| Slope              | 0 – 60 %     |
| Ponding depth      | 0 cm         |
| Water table depth  | 130 – 140 cm |
| Aspect             | SE           |

## Climatic features

Table 3 Representative climatic features

|                               |          |
|-------------------------------|----------|
| Frost-free period (average)   | 210 days |
| Freeze-free period (average)  | 230 days |
| Precipitation total (average) | 1,470 mm |

- (1) HOT SPRINGS 1 NNE [USC00033466], Hot Springs National Park, AR
- (2) MT IDA 3 SE [USC00034988], Mount Ida, AR
- (3) NIMROD DAM [USC00035200], Perryville, AR

## 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: Zafra, Sherwood, Sherless, Pirum, Octavia, Nashoba, Caston. They are Moderately deep to very deep, Well drained, and Slow to Moderately rapid permeable soils, with very acidic to slightly acidic soil reaction, that formed in Colluvium, Residuum from Sandstone and shale.

Table 4. Representative soil features

|                 |                                     |
|-----------------|-------------------------------------|
| Parent material | (1) Colluvium – sandstone and shale |
|-----------------|-------------------------------------|

|                                                          |                                                                          |
|----------------------------------------------------------|--------------------------------------------------------------------------|
| Surface texture                                          | (1) Cobbly fine sandy loam<br>(2) Very stony loam<br>(3) Extremely stony |
| Family particle size                                     | (1) Loamy                                                                |
| Drainage class                                           | Well drained                                                             |
| Permeability class                                       | Slow to moderately rapid                                                 |
| Soil depth                                               | 80 – 200 cm                                                              |
| Surface fragment cover <=3"                              | 0 – 80 %                                                                 |
| Surface fragment cover >3"                               | 0 – 80 %                                                                 |
| Available water capacity<br>(0-101.6cm)                  | 7.11 – 14.99 cm                                                          |
| Calcium carbonate equivalent<br>(0-101.6cm)              | Not specified                                                            |
| Electrical conductivity<br>(0-101.6cm)                   | Not specified                                                            |
| Sodium adsorption ratio<br>(0-101.6cm)                   | Not specified                                                            |
| Soil reaction (1:1 water)<br>(0-101.6cm)                 | 4.8 – 6.2                                                                |
| Subsurface fragment volume <=3"<br>(Depth not specified) | 0 – 50 %                                                                 |

|                                                         |          |
|---------------------------------------------------------|----------|
| Subsurface fragment volume >3"<br>(Depth not specified) | 0 – 50 % |
|---------------------------------------------------------|----------|

## 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.

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.

The reference state was dominated by Shortleaf Pine and southern red oak. Periodic disturbances from fire, wind or ice maintained the dominance of oaks by opening up the canopy and allowing more light for oak reproduction. Long disturbance-free periods allowed an increase in more shade tolerant species such as hickory and sugar maple. Two community phases are recognized in this state, with shifts between phases based on disturbance frequency.

The reference state is rare today. Some sites have been converted to grassland (State 4). Others have been subject to repeated, high-graded timber harvest coupled with uncontrolled domestic livestock grazing (State 5). Fire suppression has also resulted in increased canopy density, which has affected the abundance and diversity of ground flora. Many reference sites have been managed for timber harvest, resulting in either even-age (State 2) or uneven-age (State 3) forests.

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 5. F119XY030AR, Rubbly Backslope

Figure 6. F119XY030AR, Rubbly Backslope

## Additional community tables

## 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):

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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):

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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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