

# Ecological site F122XY008KY

## Loamy Skeletal Uplands

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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.

### MLRA notes

Major Land Resource Area (MLRA): 122X–Highland Rim and Pennyroyal

MLRA 122 is in Tennessee (47 percent), Kentucky (43 percent), Indiana (7 percent), and Alabama (3 percent). It makes up about 21,530 square miles (55,790 square kilometers).

### SOILS:

Many of the soils in this MLRA are Udalfs. The moderately deep to very deep, well drained, clayey soils formed in limestone residuum. They are dominantly in rolling to steep areas of the “Outer Basin” (Mimosa, Braxton, Gladdice, and Hampshire series) and the undulating to hilly areas of the “Inner Basin” (Talbot and Bradyville series). The most agriculturally productive soils are the very deep, well drained, clayey or loamy soils that formed in alluvium and/or loess over alluvium or limestone residuum in nearly level to undulating areas (Armour, Cumberland, Harpeth, Lomond, and Maury series). The less extensive soils generally are moderately well drained to somewhat poorly drained and formed in loamy or clayey alluvium and/or residuum (Byler, Capshaw, Colbert, and Tupelo series). This MLRA has a significant acreage of Mollisols. Shallow or moderately deep, well drained, clayey Udolls (Ashwood and Barfield series) formed in limestone residuum dominantly in rolling to steep areas. Very shallow, well drained, clayey Rendolls (Gladeville series) formed in limestone residuum dominantly in undulating to rolling areas of the “Inner Basin.” Very deep, well drained or moderately well drained Udolls (Arrington, Egam, Lynnville, and Staser series) and somewhat poorly drained or poorly drained Aquolls (Agee, Godwin, and Lanton series) formed in loamy or clayey alluvium derived from limestone on flood plains. Most of the remaining soils on flood plains are moderately well drained or well drained Udepts (Lindell and Ocana series). Udufts are of small extent in this area. Most are very deep, well drained, and loamy and formed in gravelly colluvium or colluvium and the underlying residuum on steep hillsides (Dellrose soils). Rock outcrops are common on uplands.

### BIOLOGICAL RESOURCES:

This area supports mixed oak forest vegetation. White oak, black oak, northern red oak, and some scarlet oak are the dominant tree species. Shagbark hickory, bitternut hickory, pignut hickory, and mockernut hickory also occur. Oak, blackgum, flowering dogwood, sassafras, Virginia pine, pitch pine, and shortleaf pine grow mostly on ridgetops.

(Excerpt from United States Department of Agriculture, Natural Resources Conservation Service. 2006. Land Resource Regions and Major Land Resource Areas of the United States, the Caribbean, and the Pacific Basin. U.S. Department of Agriculture Handbook 296.)

### Classification relationships

Scientific Name: Southern Interior Low Plateau Dry-Mesic Oak Forest  
Unique Identifier: CES202.898

Possible Associations:

Southern Red Oak - White Oak - Post Oak - Black Oak Forest  
Common Name: Southern Red Oak - Mixed Oak Forest  
Unique Identifier: C EGL005018

Post Oak - Blackjack Oak - (Pignut Hickory, Black Hickory) / Farkleberry Forest  
Common Name: Midwest Post Oak - Blackjack Oak Forest  
Unique Identifier: C EGL002075

## Ecological site concept

### GROUP 8 -LOAMY SKELETAL UPLANDS

The communities described in this provisional document reflect plant communities that are likely to be found on these soils and have not been field verified. This PES describes hypotheses based on available data of many different scales and sources and has not been developed utilizing site-specific ecological field monitoring. This PES does not encompass the entire complexity or diversity of these sites. Additional field studies are required prior to utilization for detailed conservation planning or developing a comprehensive and science-based restoration plan for these sites.

Forest Vegetation as listed in Official Series Descriptions (OSD):

Clarksville: Native vegetation is mixed forest of black oak, white oak, blackjack oak, post oak, shortleaf pine, hickory, ash, sugar maple, and dogwood.

Bodine: Most of this soil is in forest of chestnut oak, post oak, blackjack oak, white oak, hickory, maple, beech, eastern redcedar, and Virginia pine

Only two tree species can be selected for entry into the database as dominants; however, multiple tree species may be dominant on these sites and it will vary depending on aspect, soil depth, seed sources, management, and disturbance history.

State 1, Phase 1.1. Forestland. Plant species dominants:

black oak (*Quercus velutina*) – post oak (*Q. stellata*) / blueberry (*Vaccinium* spp.) –greenbrier (*Smilax* spp.) / little bluestem(*Schizachyrium scoparium*)

State 2, Phase 2.1:

Pasture. Plant species dominants:

*Schedonorus arundinaceus* (tall fescue).

Species present would be dependent upon seeding and management. A variety of native and non-native grasses may be planted on these sites.

Management of pasture sites should follow conservation planning standards and protocols which include watershed protection, soil health, and adequate forage species.

Transitioning this state to a reference condition would require long-term timber stand improvement practices to control non-native vegetation and manage for desired hardwood species.

State 3, Phase 3.1:

Transitional (abandoned) field. Plant species dominants:

eastern red cedar (*Juniperus virginiana*) – pines (*Pinus* spp.) / berries (*Rubus* spp.) – sumac (*Rhus* spp.) / broomsedge bluestem (*Andropogon virginicus*) -fescue (*Schedonorus arundinaceus*)

This phase is best described as an old field habitat with a mixture of native and introduced grasses and a variety of native and non-native herbs, forbs, seedlings, and saplings. Tree species regeneration on these sites will depend on the severity and duration of disturbance, soil characteristics, adjacent plant communities and seed sources, post-disturbance management inputs, presence or absence of continued site disturbances (grazing), slope, and aspect.

Transitioning this state to a reference condition would require long-term timber stand improvement practices to control non-native vegetation and manage for desired hardwood species.

Due to the shallow soils and high slope percentages, cropland was not included as a major state in this ecological model.

Additional soil mapunits may be added or removed from this group pending field development of ESDs.

**Table 1. Dominant plant species**

Tree	(1) <i>Quercus velutina</i> (2) <i>Quercus stellata</i>
Shrub	(1) <i>Vaccinium arboreum</i> (2) <i>Cornus florida</i>
Herbaceous	(1) <i>Schizachyrium scoparium</i>

## Physiographic features

These sites are located on uplands and are loamy-skeletal.

**Table 2. Representative physiographic features**

Landforms	(1) Hill (2) Ridge
Flooding frequency	None
Ponding frequency	None
Elevation	152–427 m
Slope	2–30%
Water table depth	152–203 cm

## Climatic features

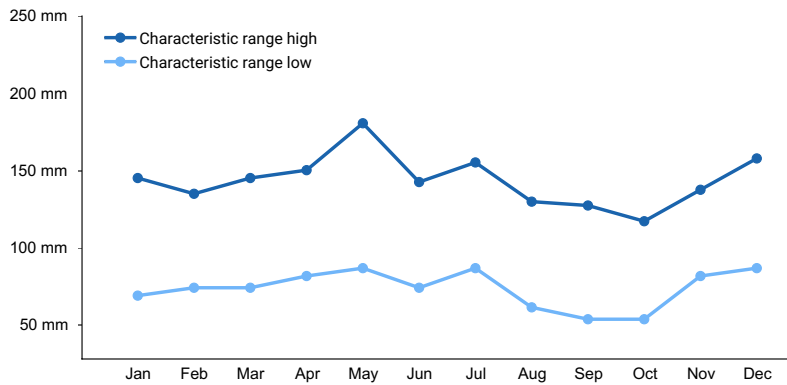
### Climate

The average annual precipitation in this area is 43 to 63 inches (1,090 to 1,600 millimeters), increasing to the south. The maximum precipitation occurs in winter and early in spring, and the minimum occurs in fall. Most of the rainfall occurs as high-intensity, convective thunderstorms. Snowfall may occur in winter. The average annual temperature is 52 to 60 degrees F (11 to 16 degrees C), increasing to the south. The freeze-free period averages 210 days and ranges from 185 to 235 days. The longer freeze-free periods occur in the more southerly parts of the area.

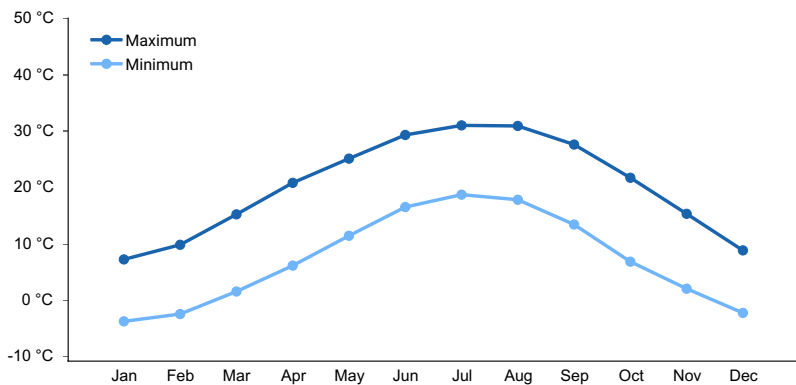
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**Table 3. Representative climatic features**

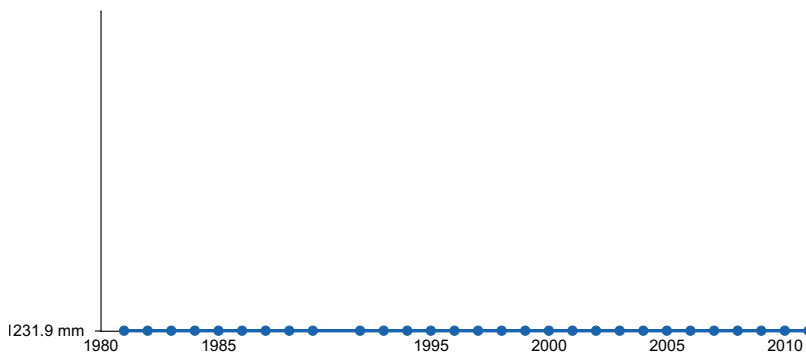
Frost-free period (average)	172 days
Freeze-free period (average)	191 days
Precipitation total (average)	1,397 mm



**Figure 1. Monthly precipitation range**



**Figure 2. Monthly average minimum and maximum temperature**



**Figure 3. Annual precipitation pattern**

### Climate stations used

- (1) COOKEVILLE [USC00402009], Cookeville, TN
- (2) WAYNESBORO [USC00409502], Waynesboro, TN
- (3) GREENSBURG [USC00153430], Greensburg, KY
- (4) SALEM [USC00127755], Salem, IN

### Influencing water features

There are no influencing water features on these sites.

### Soil features

These soils are loamy skeletal and somewhat excessively drained.

**Table 4. Representative soil features**

Parent material	(1) Colluvium–cherty limestone (2) Residuum–limestone
Surface texture	(1) Cobbly silt
Family particle size	(1) Loamy
Drainage class	Somewhat excessively drained
Permeability class	Moderate to rapid
Soil depth	203 cm
Surface fragment cover <=3"	0%
Surface fragment cover >3"	0%
Available water capacity (0-101.6cm)	10.16–20.32 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)	4.5–5
Subsurface fragment volume <=3" (Depth not specified)	0%
Subsurface fragment volume >3" (Depth not specified)	3–17%

## Ecological dynamics

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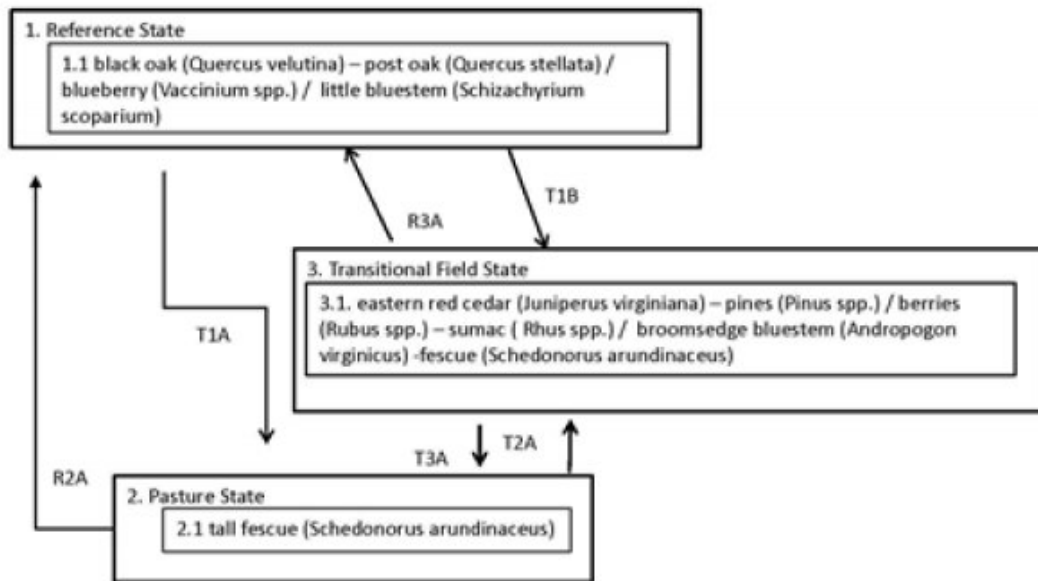
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## **State and transition model**



T1A: Pasture establishment (lower slopes only).  
 T1B: Tree removal –no post harvest management inputs. Fescue present only if on adjacent sites.  
 T3A: Pasture re-establishment. Inputs may include brush/tree removal, weed control, seeding, etc.  
 T2A: Natural transition in absence of management inputs.  
 R2A, R3A: Long term management inputs required to successfully restore a reference community.

Figure 5. Group8

### 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:**

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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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