USDA Natural Resources Conservation Service

Ecological site F120AY008KY
Loamy Skeletal Uplands

Last updated: 10/01/2024
Accessed: 05/11/2025

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): 120A–Kentucky and Indiana Sandstone and Shale Hills and Valleys, Southern Part

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This area is primarily in Kentucky (83 percent) and Illinois (17 percent). A very small part is in Indiana. The area makes up about 8,905 square miles.

Physiography:
This area is in the Highland Rim Section of the Interior Low Plateaus Province of the Interior Plains. Tributaries of the Ohio River dissect the nearly level to very steep uplands. The major streams and rivers have well defined valleys with broad flood plains and numerous stream terraces. The flood plains along the smaller streams are narrow. Elevation ranges from 345 feet (105 meters) on the flood plain along the Ohio River to about 950 feet (290 meters) on the highest ridges. Local relief varies widely within the area.

Soils:
Most of the soils are Udalfs. Most of the soils have a mesic soil temperature regime, a udic soil moisture regime, and mixed mineralogy. The soils in the area formed in loess or in sandstone, shale, siltstone, or limestone residuum. Fragiudalfs (Hosmer, Loring, and Zanesville series) and Fraglossudalfs (Sadler and Grenada series), which have a fragipan, and Hapludalfs (Wellston and Frondorf series) are the dominant soils on ridgetops and side slopes. Fragiudults (Tilsit series) and Hapludults (Gilpin and Shelocta series) are in the northern part of the area. Hapludolls (Huntington series), Eutrudepts (Nolin, Lindside, and Chagrin series), and Endoaquepts (Melvin and Newark series) are loamy soils on flood plains along the major streams. Endoaquepts and Epiaqualfs (Karnak and McGary series) are clayey soils in slackwater areas along the major rivers. Dystrudepts (Cuba and Steff series), Eutrudepts (Haymond and Wilbur series), Fluvaquents (Wakeland series), and Endoaquepts (Stendal series) are loamy soils on flood plains of local origin. Hapludalfs (Wheeling and Elk series) and Fragiudalfs (Otwood and Lawrence series) are loamy soils on terraces along the major streams.

Classification relationships

Landfire Biophysical Setting Model 4713050, Southern Interior Low Plateau Dry -Mesic Oak Forest.

Acidic sub-xeric Forest. (Natural Communities of Kentucky 2009, Kentucky State Nature Preserves Commission)

Possible: Quercus prinus -*Quercus coccinea*, *Quercus velutina*) Forest Alliance (I.B.2.N.a)

Ecological site concept

The Loamy Skeletal Uplands ecological site consists of loamy skeletal, well-drained to excessively drained soils predominately on hillsides. Represeentative soils include: Berks, Clarksville, Dekalb, Neotoma, Varilla, Wallen.

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. Field studies would be required to develop a comprehensive and science-based restoration plan for these sites.

State 1, Phase 1.1.
Forestland. Plant species dominants:
black oak (*Quercus velutina*) – scarlet oak (*Q. coccinea*) / blueberry (Vaccinium spp.) –greenbrier (Smilax spp.) / panic grass (Panicum spp.)

State 2, Phase 2.1:
Pasture. Plant species dominants:
Schedonorus arundinaceus (tall fescue).
Species present would be dependent upon seeding and management.

State 3, Phase 3.1:
Transitional (abandoned) field. Plant species dominants:
eastern red cedar (*Juniperus virginiana*) - black locust (*Robinia pseudoacacia*) / 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. Species present would depend on adjacent seed sources and the presence of on-going disturbances such as grazing, mowing, etc.

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

Restoration of states to the reference community would require long-term, intensive management inputs.

Associated sites

F120AY006KY	**Shallow Sandstone Uplands** Shallow Sandstone Uplands

Table 1. Dominant plant species

Tree	(1) *Quercus velutina* (2) *Quercus coccinea*
Shrub	(1) *Vaccinium* (2) *Smilax*
Herbaceous	(1) *Panicum*

Physiographic features

This initial grouping consists of loamy skeletal, well-drained to excessively drained soils predominately on hillsides.

Table 2. Representative physiographic features

Landforms	(1) Upland > Hillside
Runoff class	Low to very high
Elevation	350–1,000 ft
Slope	10–70%
Water table depth	72 in

Aspect	Aspect is not a significant factor

Climatic features

MLRA climate summary: The average annual precipitation in most of this area is 45 to 54 inches (1,145 to 1,370 millimeters). About 60 percent of the precipitation falls during the freeze-free period. Most of the rainfall occurs as high-intensity, convective thunderstorms in summer. Snowfall is common in winter. The average annual temperature is 55 to 58 degrees F (13 to 14 degrees C). The freeze-free period averages 210 days and ranges from 190 to 230 days. The longer freeze-free periods occur along the Ohio River. From: 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, 2006)

Table 3. Representative climatic features

Frost-free period (characteristic range)	150-169 days
Freeze-free period (characteristic range)	177-194 days
Precipitation total (characteristic range)	47-49 in
Frost-free period (actual range)	143-174 days
Freeze-free period (actual range)	173-195 days
Precipitation total (actual range)	45-50 in
Frost-free period (average)	160 days
Freeze-free period (average)	185 days
Precipitation total (average)	48 in

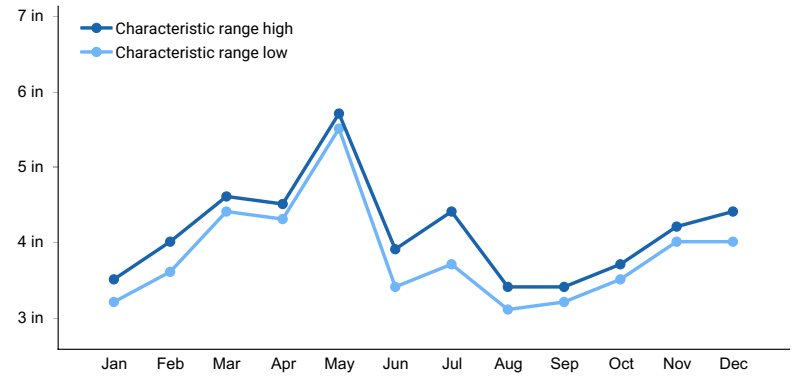

Figure 1. Monthly precipitation range

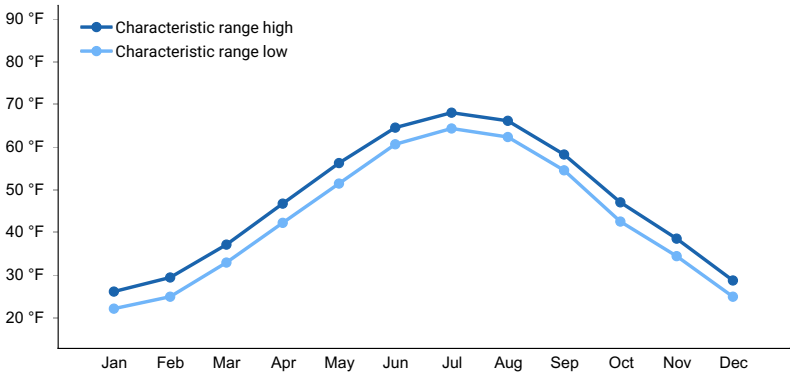

Figure 2. Monthly minimum temperature range

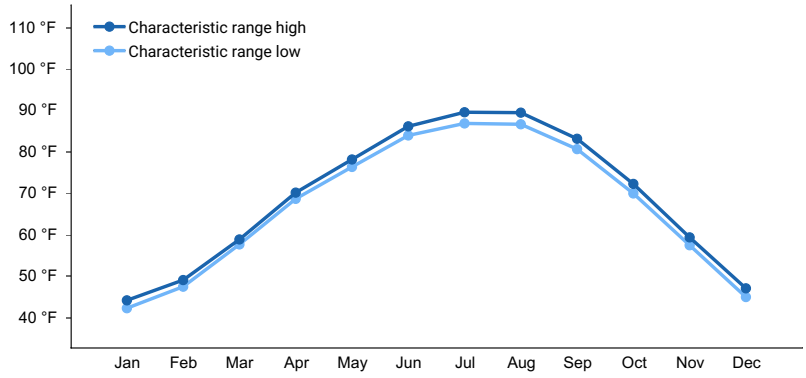

Figure 3. Monthly maximum temperature range

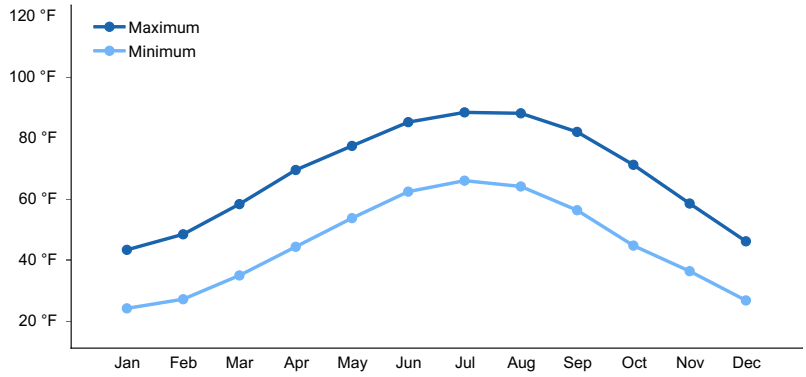

Figure 4. Monthly average minimum and maximum temperature

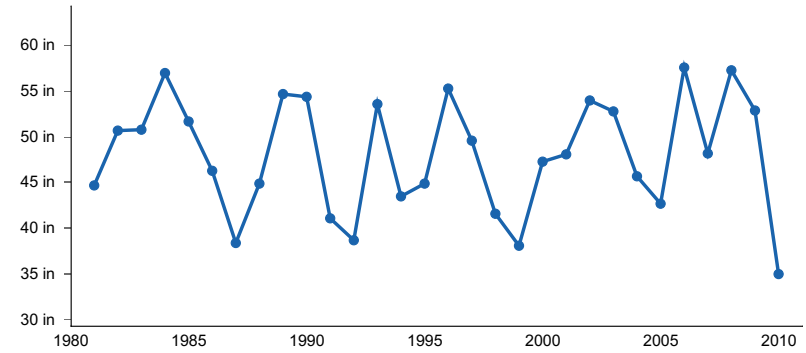

Figure 5. Annual precipitation pattern

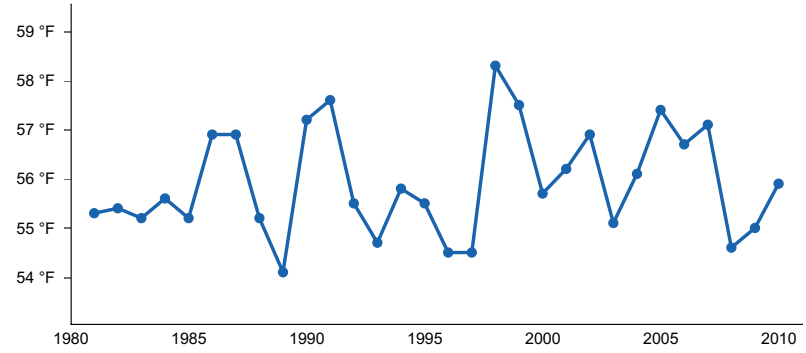

Figure 6. Annual average temperature pattern

Climate stations used

- (1) HENDERSON 8 SSW [USC00153762], Henderson, KY
- (2) OWENSBORO 1 W [USC00156091], Owensboro, KY
- (3) LEITCHFIELD 2 N [USC00154703], Leitchfield, KY

- (4) ROSICLARE 5NW [USC00117487], Herod, IL

Influencing water features

There are no influencing water features for these sites.

Soil features

This initial grouping consists of loamy skeletal, well-drained to excessively drained soils predominately on hillsides. Represeentative soils include: Berks, Clarksville, Dekalb, Neotoma, Varilla, Wallen.

In the future, this group may be split into multiple ecological site descriptions due to differences in AWC.

Table 4. Representative soil features

Parent material	(1) Colluvium–sandstone and shale (2) Loess–sandstone and siltstone (3) Residuum–shale
Surface texture	(1) Channery sandy loam (2) Flaggy silty clay loam (3) Gravelly loam
Family particle size	(1) Loamy
Drainage class	Well drained to excessively drained
Soil depth	20–62 in
Surface fragment cover <=3"	0–3%
Surface fragment cover >3"	2–3%
Available water capacity (0-40in)	2.3–7.6 in
Soil reaction (1:1 water) (0-40in)	3.6–7.8
Subsurface fragment volume <=3" (Depth not specified)	1–30%
Subsurface fragment volume >3" (Depth not specified)	0–36%

Ecological dynamics

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. Field studies would be required to develop a comprehensive and science-based restoration plan for these sites.

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State and transition model

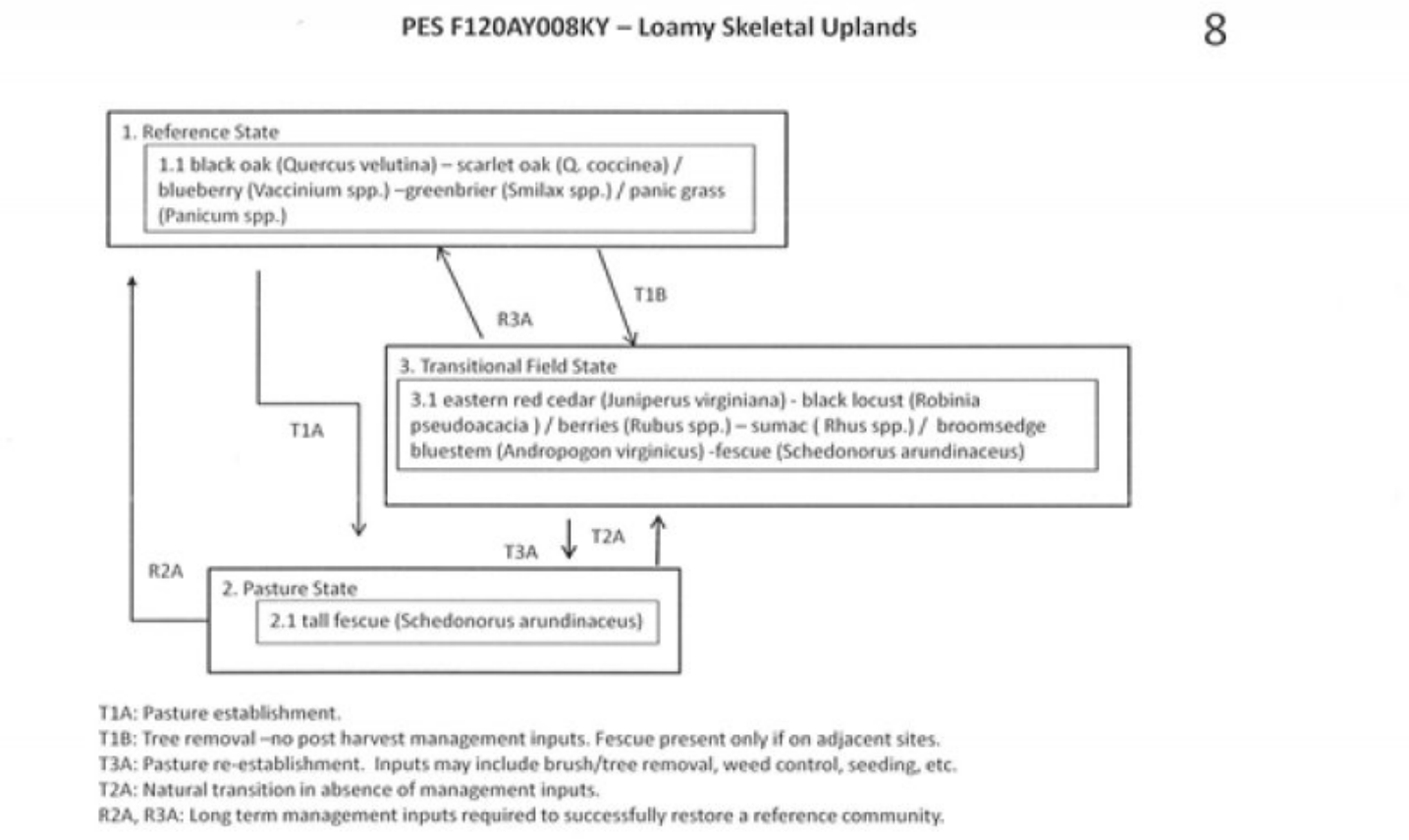

Figure 7. group8

Inventory data references

Site Development and Testing Plan
Future work is needed, as described in a future project plan, to validate the information presented in this provisional ecological site description. Future work includes field sampling, data collection and analysis by qualified vegetation ecologists and soil scientists. As warranted, annual reviews of the project plan can be conducted by the Ecological Site Technical Team. A final field review, peer review, quality control, and quality assurance reviews of the ESD are necessary to approve a final document.

Other references

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Comer, P., D. Faber-Langendoen, R. Evans, S. Gawler, C. Josse, G. Kittel, S. Menard, M. Pyne, M. Reid, K. Schulz, and K. Snow. 2003. Ecological Systems of the United States: A Working Classification of US Terrestrial Systems. NatureServe, Arlington, VA. (https://www.natureserve.org/sites/default/files/pcom_2003_ecol_systems_us.pdf).

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NatureServe 2020. NatureServe Explorer: An Online Encyclopedia of Life [web application]. NatureServe, Arlington, VA. (http://explorer.natureserve.org)
Soil Survey Staff-USDA-NRCS [United States Department of Agriculture, Natural Resources Conservation Service] 2016. National Soils Information Service (NASIS Data Model Version 7.3.4) Lincoln, NE. (https://www.nrcs.usda.gov/wps/portal/nrcs/detailfull/soils/survey/tools/?cid=nrcs142p2_053552).

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USNVC [United States National Vegetation Classification]. 2019. United States National Vegetation Classification Database, V2.03. Federal Geographic Data Committee, Vegetation Subcommittee, Washington DC. (http://usnvc.org).

Approval

Greg Schmidt, 10/01/2024

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	05/11/2025
Approved by	Greg Schmidt
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):**

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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:**
