USDA Natural Resources Conservation Service

Ecological site F128XY510WV
Thermic Moderately Well Drained Alfic Limestone Uplands

Accessed: 04/29/2024

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): 128X–Southern Appalachian Ridges and Valleys

MLRA 128, partially shown as the gray shaded area on the accompanying figure, falls into the East and Central Farming and Forest Region. This MLRA is in Tennessee (36 percent), Alabama (27 percent), Virginia (25 percent), and Georgia (12 percent). It makes up about 21,095 square miles (54,660 square kilometers).

Most of this MLRA is in the Tennessee Section of the Valley and Ridge Province of the Appalachian Highlands. The thin stringers in the western part of the area are mostly in the Cumberland Plateau Section of the Appalachian Plateaus Province of the Appalachian Highlands. A separate area of the MLRA in northern Alabama is in the Highland Rim Section of the Interior Low Plateaus Province of the Interior Plains. The western side of the area is dominantly hilly to very steep and is rougher and much steeper than the eastern side, much of which is rolling and hilly. Elevation ranges from 660 feet (200 meters) near the southern end of the area to more than 2,400 feet (730 meters) in the part of the area in the western tip of Virginia. Some isolated linear mountain ridges rise to nearly 4,920 feet (1,500 meters) above sea level.

The MLRA is highly diversified. It has many parallel ridges, narrow intervening valleys, and large areas of low, irregular hills. The bedrock in this area consists of alternating beds of limestone, dolomite, shale, and sandstone of early Paleozoic age. Ridgetops are capped with more resistant carbonate and sandstone layers, and valleys have been eroded into the less resistant shale beds. These folded and faulted layers are at the southernmost extent of the Appalachian Mountains. The narrow river valleys are filled with unconsolidated deposits of clay, silt, sand, and gravel.

Ecological site concept

This PES occurs on residuum or colluvium, and alluvium on uplands underlain by argillaceous limestone in the southern Ridge and Valley, MLRA 128. This PES falls within the Southern Ridge and Valley Dry Calcareous Forest concept developed by NatureServe. This site will contain glades that are of great conservation value and rare in the Ridge and Valley. These will occur where there are areas of level rock outcrop. Good examples can be found at the Chickamauga National Battlefield in Georgia.

Table 1. Dominant plant species

Tree	(1) *Quercus stellata* (2) *Juniperus virginiana*
Shrub	(1) *Viburnum rufidulum*
Herbaceous	Not specified

Physiographic features

This PES occurs on residuum or colluvium, and alluvium on uplands underlain by argillaceous limestone in the

southern Ridge and Valley, MLRA 128.

Table 2. Representative physiographic features

Landforms	(1) Interfluve (2) Ridge (3) Hill
Elevation	152–427 m
Slope	0–25%
Water table depth	56–130 cm
Aspect	N, S

Climatic features

This area falls under the humid, mesothermal climate classification (Thornwaite, 1948). Precipitation is fairly evenly distributed throughout the year, with little or no water deficiency during any season. The average annual precipitation in most of this area is 45 to 55 inches. It increases to the south. Maximum precipitation occurs in midwinter and midsummer, and the minimum occurs in autumn. Most rainfall occurs as high-intensity, convective thunderstorms. Snowfall may occur in winter. Average annual temperatures range from 46 to 70 degrees F, increasing to the south. The freeze-free period averages 205 days and is longest in the southern part of the area and shortest at higher elevations to the north. The growing season corresponds to climate. Local climate can be variable and microclimates factor into the distribution of plants. In general, topographic features such as slope aspect, landform, steepness, and position of the ridges and valleys are important site variables in the distribution of vegetation across the landscape (Martin, 1989).

Table 3. Representative climatic features

Frost-free period (average)	181 days
Freeze-free period (average)	207 days
Precipitation total (average)	1,422 mm

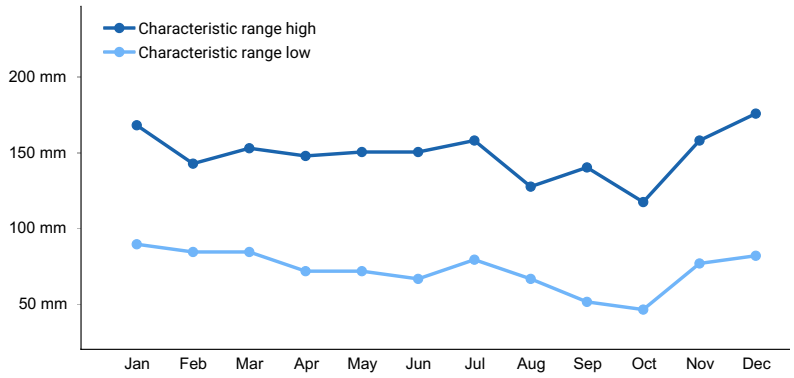

Figure 1. Monthly precipitation range

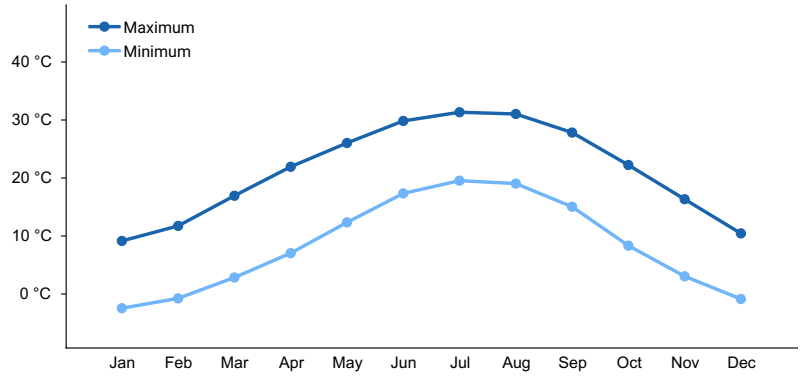

Figure 2. Monthly average minimum and maximum temperature

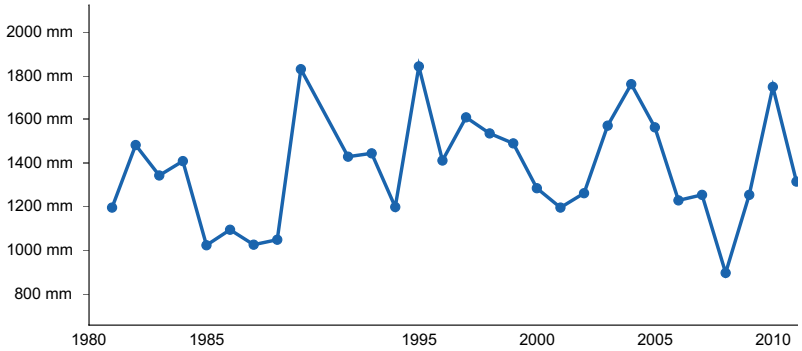

Figure 3. Annual precipitation pattern

Climate stations used

- (1) NORRIS [USC00406619], Andersonville, TN
- (2) CLEVELAND FLTR PLT [USC00401808], Charleston, TN
- (3) KINGSTON [USC00404871], Harriman, TN
- (4) ROME [USC00097600], Rome, GA
- (5) ATHENS [USC00400284], Athens, TN

Influencing water features

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

Soil features

These soils formed in residuum or colluvium, and alluvium on uplands underlain by argillaceous limestone. The slopes range from 0 to 25 percent. They are moderately deep and deep (20 to 60 inches) to bedrock, and are moderately well to well drained. The available water capacity of these soils ranges from low to high. The depth to a seasonal high water table is 1.5 to more than 6 feet. They are not subject to flooding or ponding. The soil reaction ranges from very strongly acid to moderately alkaline (pH from 4.5 to 8.4).

The soil series associated with this site are: Colbert, Hollywood, Lyerly, Swaim

Parent Material Kind: residuum, colluvium

Parent Material Origin: limestone, argillaceous; limestone, sandstone and shale; limestone, unspecified

Table 4. Representative soil features

Parent material	(1) Residuum–argillaceous limestone (2) Colluvium–limestone, sandstone, and shale

Surface texture	(1) Gravelly clay (2) Clay loam (3) Fine sandy loam
Drainage class	Moderately well drained to well drained
Permeability class	Very slow to moderate
Soil depth	71–183 cm
Surface fragment cover <=3"	0–5%
Surface fragment cover >3"	5%
Available water capacity (0-101.6cm)	9.4–16.26 cm
Soil reaction (1:1 water) (0-101.6cm)	5.5–7.5
Subsurface fragment volume <=3" (Depth not specified)	0–10%
Subsurface fragment volume >3" (Depth not specified)	0–12%

Ecological dynamics

The soils to be correlated with this ecological site are Colbert and Lyerly consociations and complexes. Glade plant communities will likely occur on the rock outcrop component of these mapunits, with mixed oak/hickory forests on deeper soil components. Herbaceous diversity can be quite high on these sites and highly variable, dependant on soil depth.

This PES is associated with the Southern Ridge and Valley Dry Calcareous Forest in Natureserve. Common species might include white oak, northern red oak, chinquapin oak, sugar maple and shumard oak. Pines might be important at the southern extent of this site. Glades occur where there is rock outcrop. Good examples can be found at the Chickamauga Battlefield National Park.

DeSelm had numerous plots on this PES. He characterized it as mostly being dominated by post oak, with cedar and Shumard oak also listed as important species. Several of his plots had been grazed in the past. Deer browse was not noted. He did note Japanese honeysuckle on one plot and on another, sugar maple invading.

State and transition model

Other references

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Contributors

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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):**

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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:**
