Ecological site F128XY512WV
Frigid Interbedded Sedimentary Residuum

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): 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.

Classification relationships

This PES may correlate with Northern Red Oak Forests and Northern Hardwood Forests according to the "The Natural Communities of Virginia, Second Approximation" (http://www.dcr.virginia.gov/natural-heritage/natural-communities/nctig). Representative community types described by NatureServe include the Central Appalachian Northern Red Oak Forest (USNVC: = CEGL008506), and the Southern Appalachian Northern Red Oak Forest (Deciduous Shrub Type), USNVC: = CEGL007300. The Southern Appalachian Northern Red Oak Forest (Evergreen Shrub Type), USNVC: = CEGL007299 may also occur on this site.

The U.S. Forest Service's ecoregional classification, Central Appalachian Broadleaf Forest-Coniferous Forest-Meadow M221) also encompasses this PES:
http://www.fs.fed.us/land/ecosysmgmt/colorimagemap/images/m221.html

The U.S. Environmental Protection Agency (EPA), classifies this PES under "Southern Sandstone Ridges" in their tier IV ecoregional classification. The Southern Sandstone Ridges region encompasses the major sandstone ridges, but these ridges also have areas of shale, siltstone, and conglomerate. The steep, forested ridges tend to have narrow crests, and the soils are typically stony, sandy, and of low fertility. The chemistry of streams flowing down the ridges can vary greatly depending on the geologic material. In Georgia and Tennessee, most of the sandstone ridges are relatively narrow, but in Alabama, the region also includes the Coosa and Cahaba ridges that are broader

and of younger Pennsylvanian-age sandstone and shale. Although most all of the ridges were once logged, a variety of forest types of different ages and composition occurs here. The natural vegetation consists primarily of oak-hickory-pine forest. Red oak, chestnut oak, black oak, and some white oak communities are typical, along with pines such as loblolly pine, Virginia pine and shortleaf pine. Some pitch pine can be found on the higher, exposed ridges in the north (cite EPA).

Ecological site concept

This site occurs on moderately deep, well drained soils formed in residuum of red noncalcareous shale, siltstone, and sandstone on mountain summits, shoulders and side slopes and moderately deep, somewhat excessively drained to well drained soils formed in residuum from acid sandstone interbedded with shale and siltstone on summits and shoulders of ridges at elevations between 3,200 to 5,000 feet. Permeability is moderately rapid. Slope ranges from 0 to 80 percent. Mean annual precipitation is about 47 inches, and mean annual air temperature is about 46 degrees F.

This PES is of small extent.

Vegetation is mainly in forest. Native forest species include northern red oak, sugar maple, black cherry, white ash, American beech black birch, red maple, chestnut oak and red spruce. The understory includes striped maple, black birch, azalea, mountain laurel, ferns, black cherry, red maple, sugar maple, and witch hazel. Forestry is an important land-use.

Table 1. Dominant plant species

Tree	(1) *Quercus rubra* (2) *Acer saccharum*
Shrub	(1) *Acer pensylvanicum*
Herbaceous	Not specified

Physiographic features

These soils formed dominantly in residuum from interbedded sedimentary rocks at high elevations. The slopes range from 3 to 80 percent. They are moderately deep (20 to 40 inches) to bedrock, and are well to somewhat excessively drained. The available water capacity of these soils is very low or low. The depth to a seasonal high water table is 3 feet or more. They are not subject to flooding or ponding. The soil reaction ranges from extremely acid to strongly acid (pH from 3.5 to 5.5).

Table 2. Representative physiographic features

Landforms	(1) Ridge
Flooding frequency	None
Ponding frequency	None
Slope	3–80%
Water table depth	60 in
Aspect	N, SW

Climatic features

The average annual precipitation in most of this area is 41 to 55 inches (1,040 to 1,395 millimeters). It increases to the south and is as much as 66 inches (1,675 millimeters) at the highest elevations in east Tennessee and the northwest corner of Georgia. The maximum precipitation occurs in midwinter and midsummer, and the minimum occurs in autumn. Most of the rainfall occurs as high-intensity, convective thunderstorms. Snowfall may occur in winter. The average annual temperature is 52 to 63 degrees F (11 to 17 degrees C), increasing to the south. The freeze-free period averages 205 days and ranges from 165 to 245 days. It is longest in the southern part of the area and shortest at high elevations and at the northern end. As this site falls into the frigid temperature regime, the frost

free period is shorter than the MLRA average.

Table 3. Representative climatic features

Frost-free period (average)	140 days
Freeze-free period (average)	164 days
Precipitation total (average)	42 in

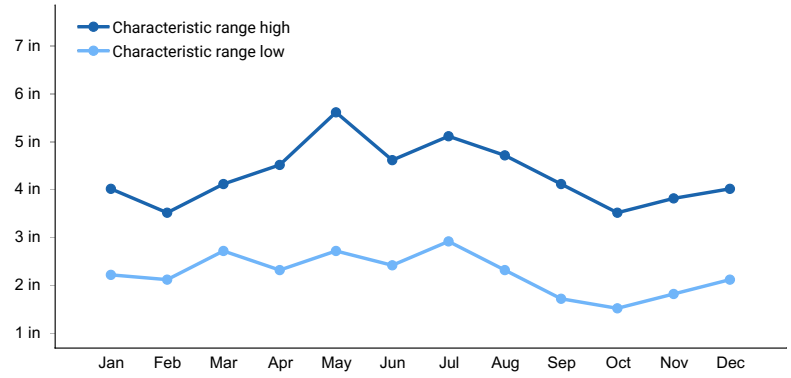

Figure 1. Monthly precipitation range

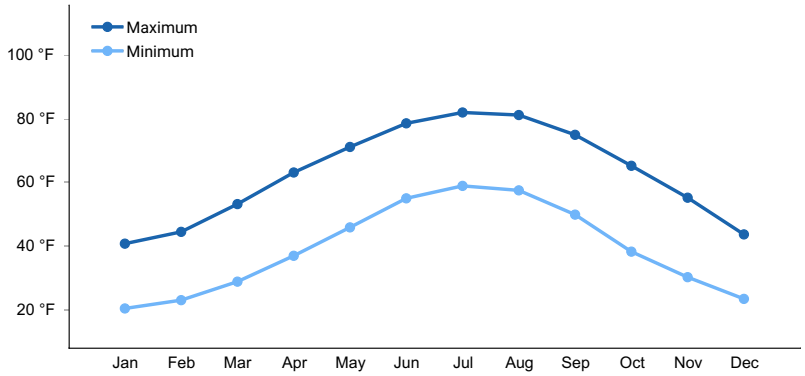

Figure 2. Monthly average minimum and maximum temperature

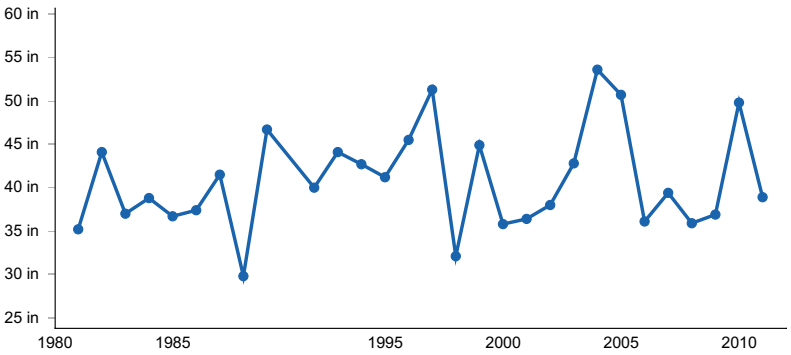

Figure 3. Annual precipitation pattern

Climate stations used

- (1) BURKES GARDEN [USC00441209], Tazewell, VA
- (2) RADFORD 3 N [USC00446999], Blacksburg, VA
- (3) STAFFORDSVILLE 3 ENE [USC00448022], Pearisburg, VA
- (4) BLAND [USC00440792], Bland, VA

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: Madsheep, Mandy, Paddyknob, Summers

Parent Material Kind: Residuum
Parent Material Origin: Sandstone, Shale, Shale and siltstone

Table 4. Representative soil features

Parent material	(1) Residuum–sandstone
Surface texture	(1) Channery loam (2) Gravelly sandy loam
Drainage class	Well drained to somewhat excessively drained
Permeability class	Very slow to rapid
Soil depth	20–40 in
Surface fragment cover <=3"	0–9%
Surface fragment cover >3"	2–9%
Available water capacity (0-40in)	2.5–4.1 in
Soil reaction (1:1 water) (0-40in)	4.2–5.2
Subsurface fragment volume <=3" (Depth not specified)	0–25%
Subsurface fragment volume >3" (Depth not specified)	0–65%

Ecological dynamics

Vegetation is mainly in forest. Native forest species include northern red oak, sugar maple, black cherry, white ash, American beech black birch, red maple, chestnut oak and red spruce. The understory includes striped maple, black birch, azalea, mountain laurel, ferns, black cherry, red maple, sugar maple, and witch hazel. Forestry is an important land-use.

*Note: No vegetation plot data are available for this PES. Vegetation description comes entirely from OSDs.

State and transition model

Other references

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Martin, William H. 1989. Forest patterns in the Great Valley of Tennessee. Journal of the Tennessee Academy of Science 64(3): 137 – 143.

Thornthwaite, Charles W. 1948. An approach toward a rational classification of climate. Geographical Review 38(1): 55-94.

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.

Vegetation plot data. 2015. Retrieved from: http://vegbank.org/vegbank/index.jsp

Vegetation community description. 2015.
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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:**
