Ecological site F128XY511WV
Thermic Residuum And Colluvium From Metamorphic Rocks

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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): 128X–Southern Appalachian Ridges and Valleys

MLRA 128 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 soils that formed in materials weathered from metamorphic and igneous rocks. Most of the area was in forest but much of it has been cleared for agriculture. Common trees in forested areas are scarlet oak, white oak, yellow-poplar, eastern white pine, shortleaf pine, Virginia pine, and northern red oak.

Table 1. Dominant plant species

Tree	(1) *Quercus coccinea* (2) *Pinus*
Shrub	(1) *Kalmia latifolia* (2) *Rhododendron maximum*
Herbaceous	Not specified

Physiographic features

This PES occurs on soils that formed in materials weathered from metamorphic and igneous rocks.

Table 2. Representative physiographic features

Landforms	(1) Hill (2) Ridge
Slope	2–10%
Water table depth	152 cm
Aspect	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

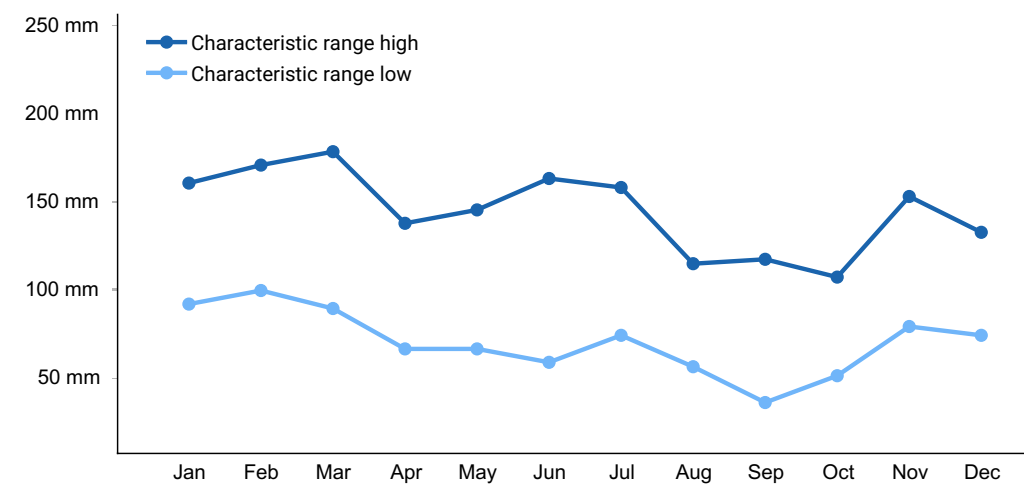|	
Frost-free period (average)	193 days
Freeze-free period (average)	228 days
Precipitation total (average)	1,372 mm

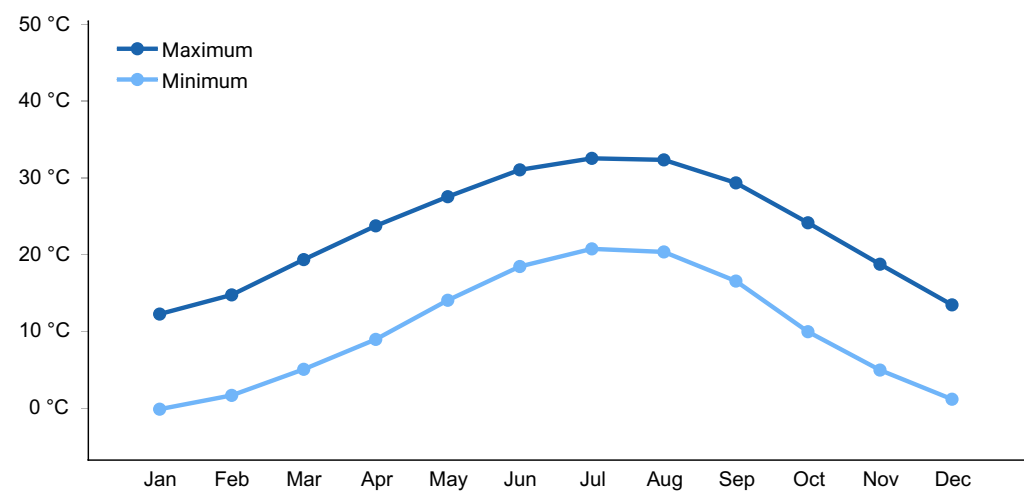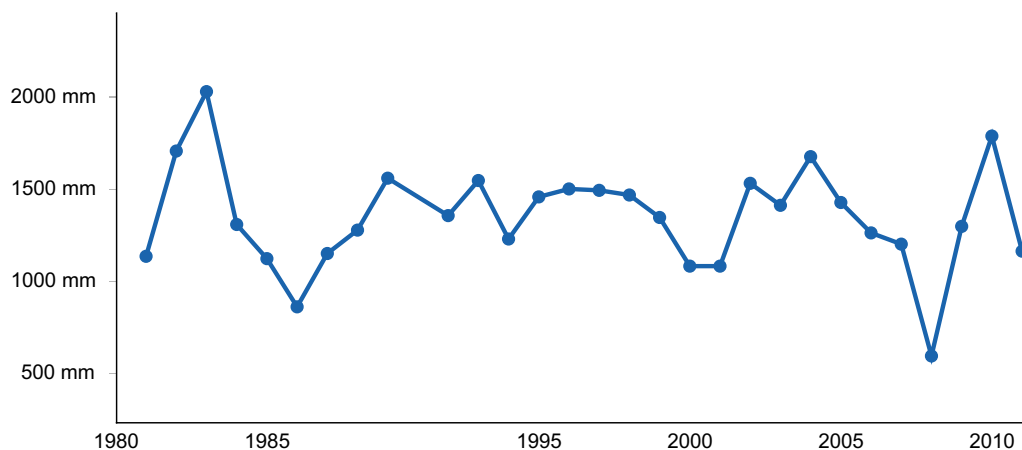**Figure 1. Monthly precipitation range**

Figure 2. Monthly average minimum and maximum temperature

Figure 3. Annual precipitation pattern

Climate stations used

- (1) TALLADEGA [USC00018024], Talladega, AL
- (2) ANNISTON METRO AP [USW00013871], Oxford, AL

Influencing water features

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

Soil features

These soils formed in materials weathered from metamorphic and igneous rocks. The slopes range from 2 to 40 percent. They are shallow to very deep (10 to more than 60 inches) to bedrock, and are moderately well drained. The available water capacity of these soils ranges from very low to moderate. The depth to a seasonal high water table is more than 6 feet. They are not subject to flooding or ponding. The soil reaction ranges from very strongly acid to strongly acid (pH from 4.5 to 5.5).

The soil series associated with this site are: Talladega, Tate

Parent Material Kind: residuum

Parent Material Origin: slate; metamorphic, unspecified

Table 4. Representative soil features

Parent material	(1) Residuum–slate
Surface texture	(1) Gravelly sandy clay loam
Drainage class	Well drained
Permeability class	Moderate to moderately rapid

|	
Soil depth	15–165 cm
Surface fragment cover <=3"	0%
Surface fragment cover >3"	0%
Available water capacity (0-101.6cm)	13.97 cm
Soil reaction (1:1 water) (0-101.6cm)	5
Subsurface fragment volume <=3" (Depth not specified)	6–15%
Subsurface fragment volume >3" (Depth not specified)	4–6%

Ecological dynamics

This PES consists of two soil series. For Tate soils, about half is cleared and used for growing corn, small grain, tobacco, truck crops, and pasture. Common trees in forested areas are scarlet oak, white oak, yellow-poplar, eastern white pine, shortleaf pine, Virginia pine, and northern red oak. Understory plants include mountain-laurel, rhododendron, blueberry, greenbrier, flowering dogwood, black locust, honeysuckle, sourwood, and flame azalea.

Talladega soils occur on narrow ridgetops and sideslopes chiefly of the Blue Ridge MLRA but to a minor extent on adjacent areas in the Appalachian ridges and valleys. They are chiefly forested to oaks, poplar, hickory, sourwood, dogwood, and blackgum and some shortleaf pine and Virginia pine. Many areas have laurel and azaleas in the undergrowth.

*Note: The only vegetation information available for this PES comes from the Official Series Descriptions. No plot data are available. Due to the lack of sufficient data, a very generalized State and Transition Model has been developed. The lack of detail is intentional and should be populated in future projects.

State and transition model

Ecosystem states

| 1. Forested State | → T1A → | 2. Grassland State |

T2A
R3B
R3A

3. Abandoned State
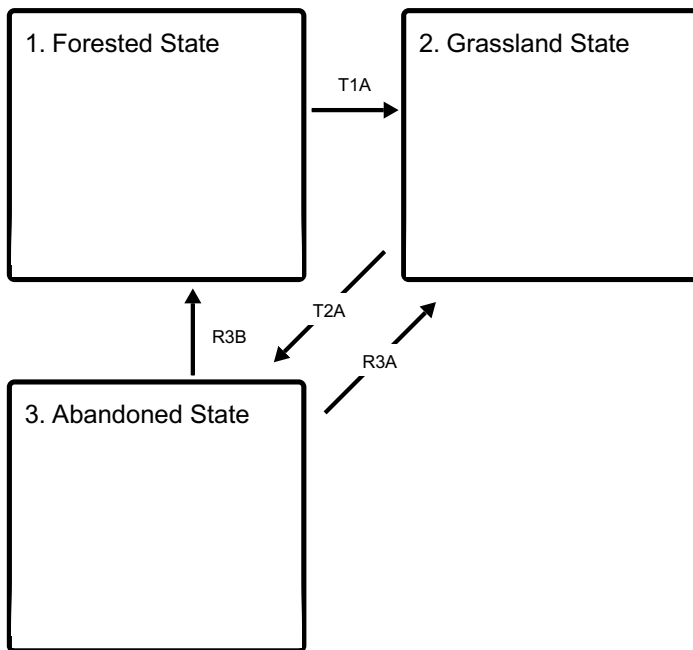
State 1
Forested State

This state approximates reference conditions. It varies widely across the MLRA from north to south. Generally, forests consist of some mixture of pine and hardwood species. Notable species include the hickories, red oak, white oak, chestnut oak, blackjack oak, shortleaf pine, longleaf pine, eastern white pine, and Virginia pine. Yellow poplar and the maples are also common. Some areas are planted in pine for pulpwood production. If this is found to be an important land-use, it may require it's own state in future iterations.

State 2
Grassland State

The primary land-use is pasture and hay.

State 3
Abandoned State

This state represents a managed site (E.g., pasture) that is no longer being managed and has been abandoned to succession. Species composition and overall health of this state will largely depend on the type and extent of previous land-use disturbance. It is likely that non-native invasive plants will be introduced to this state. Other native early successional species will also be represented but will naturally fall out over time as the site ages. In some cases, early successional habitat is desirable (E.g., for some wildlife species). If that is the case, then it must be managed to be maintained. Management practices should be locally determined based on the native species composition, presence of non-native invasive plants and landowner goals.

Transition T1A
State 1 to 2

Tree clearing, pasture species establishment, continued pasture management

Transition T2A
State 2 to 3

Natural succession after pasture/hay management ceases. Sometimes this includes invasion by undesirable non-native plants.

Restoration pathway R3B
State 3 to 1

If few or no invasive, non-native plant species are present this site will naturally regenerate to the forested state. In some cases, herbicide or mechanical control might be needed to select desirable species if the future goal is timber management. In some cases, tree planting might be merited.

Restoration pathway R3A
State 3 to 2

Brush clearing where needed, application of herbicides where needed, pasture management (may include re-seeding with desirable forage). Where native grasslands/prairies are the management objective, different techniques should be employed. Site preparation and seeding mixtures would likely be needed. If early successional habitat is the management goal, practices such as brush clearing, herbicide application where needed and prescribed fire might be necessary to maintain this condition.

Other references

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Contributors

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Approval

Matthew Duvall, 5/14/2025

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	05/21/2025
Approved by	Matthew Duvall
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:

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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:**