

Ecological site F129XY005WV Shale Ridge

Last updated: 9/10/2019
Accessed: 05/04/2024

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): 129X–Sand Mountain

Major Land Resource Area (MLRA) 129 is in Alabama (96 percent), Georgia (3 percent), and Tennessee (1 percent). It makes up about 8,030 square miles (20,805 square kilometers). The towns of Jasper, Cullman, and Fort Payne, Alabama, are in this MLRA. Interstate 65 crosses this area from north to south, and Interstates 24 and 59 join in the area just west of Chattanooga, Tennessee, which is just outside the northeast tip of the MLRA. Areas of the Redstone Arsenal Military Reservation are in the northern part of the MLRA. The William B. Bankhead National Forest and the Sipsey National Forest Wilderness are in the western part.

Most of this area is in the Cumberland Plateau Section of the Appalachian Plateaus Province of the Appalachian Highlands. This MLRA is deeply dissected and consists mainly of a series of rather narrow valleys, steep escarpments, and broad plateaus that are underlain by consolidated bedrock. Elevation ranges from 230 to 1,740 feet (70 to 530 meters). Valley floors are commonly about 100 to 400 feet (30 to 120 meters) below the adjacent plateau summits, but local relief may be as much as 1,200 feet (365 meters). The extent of the major Hydrologic Unit Areas (identified by four-digit numbers) that make up this MLRA is as follows: Mobile-Tombigbee (0316), 50 percent; Middle Tennessee-Elk (0603), 25 percent; Alabama (0315), 21 percent; and Middle Tennessee-Hiwassee (0602), 4 percent. The Sipsey Fork, Locust Fork, and Mulberry Fork Rivers, headwaters of the Black Warrior River, are in this area. The Tennessee River forms part of the northern boundary of the area.

Classification relationships

The United States Forest Service has determined that this PES falls within the 231-Southeastern Mixed Forest Province Ecological Subregion (McNab et al. 2014). This ecoregion has generally uniform maritime climate with mild winters and hot, humid summers. Annual precipitation is evenly distributed, but a brief period of mid to late summer drought occurs in most years. Landscape is hilly with increasing relief farther inland. Forest vegetation is a mixture of deciduous hardwoods and conifers. Because their classification system does not specifically address Sand Mountain, parts of 231C-Southern Cumberland Plateau Section and/or 231D-Southern Ridge and Valley Section could be included.

Ecological site concept

This site occurs on uplands weathered from shale or interbedded shale and sandstone. It is primarily forested but some areas are used for growing pasture, cotton, corn, and small grains. An approximation from the NatureServe* classification system is Southern Appalachian Low-Elevation Pine Forest (CES202.332) although it is possible that more hardwoods dominate. Further investigation in the field is required to determine an appropriate vegetation classification. For initial classification purposes, the referenced NatureServe ecological community will be described here.

Associated sites

F129XY007WV	Sandstone Ridge These sites occur over sandstone on ridges.
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Similar sites

F129XY006WV	Steep Shale These sites also occur on shale but are steeper.
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Table 1. Dominant plant species

Tree	(1) <i>Pinus echinata</i> (2) <i>Quercus nigra</i>
Shrub	(1) <i>Cornus florida</i>
Herbaceous	Not specified

Physiographic features

This PES occurs primarily on residuum on uplands underlain by interbedded sedimentary rocks in MLRA 129.

Table 2. Representative physiographic features

Landforms	(1) Hill (2) Hillslope (3) High hill
Elevation	70–530 m
Slope	2–15%
Water table depth	46 cm
Aspect	Aspect is not a significant factor

Climatic features

Table 3. Representative climatic features

Frost-free period (characteristic range)	180-189 days
Freeze-free period (characteristic range)	204-206 days
Precipitation total (characteristic range)	1,422-1,524 mm
Frost-free period (actual range)	177-191 days
Freeze-free period (actual range)	204-206 days
Precipitation total (actual range)	1,372-1,524 mm
Frost-free period (average)	184 days
Freeze-free period (average)	205 days
Precipitation total (average)	1,473 mm

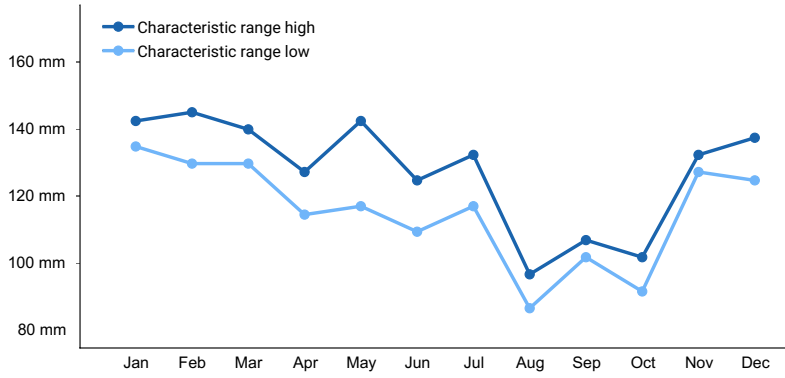


Figure 1. Monthly precipitation range

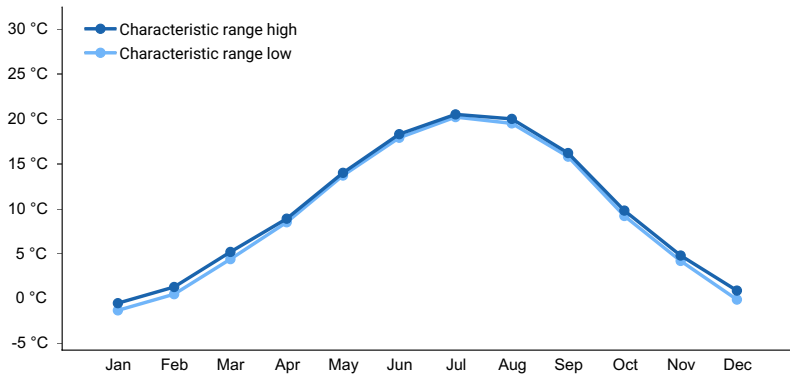


Figure 2. Monthly minimum temperature range

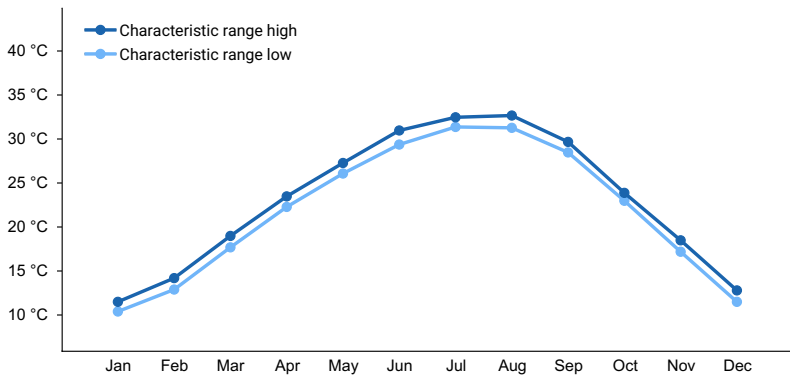


Figure 3. Monthly maximum temperature range

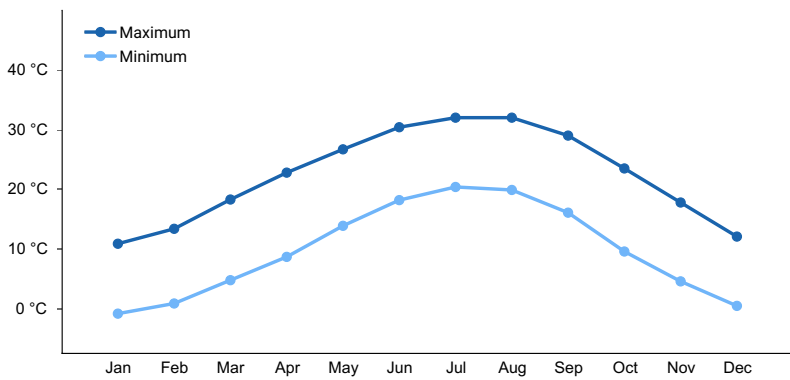


Figure 4. Monthly average minimum and maximum temperature

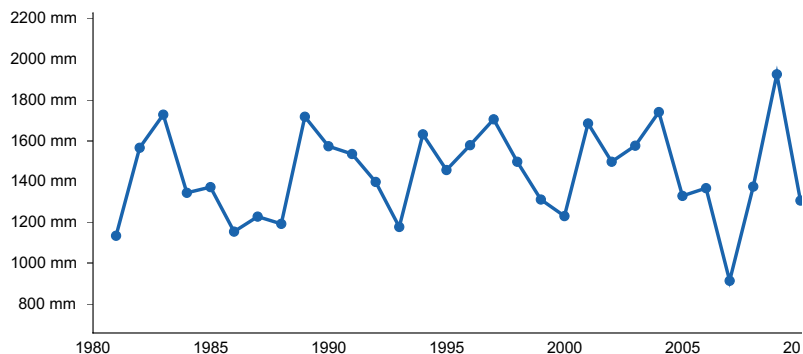


Figure 5. Annual precipitation pattern

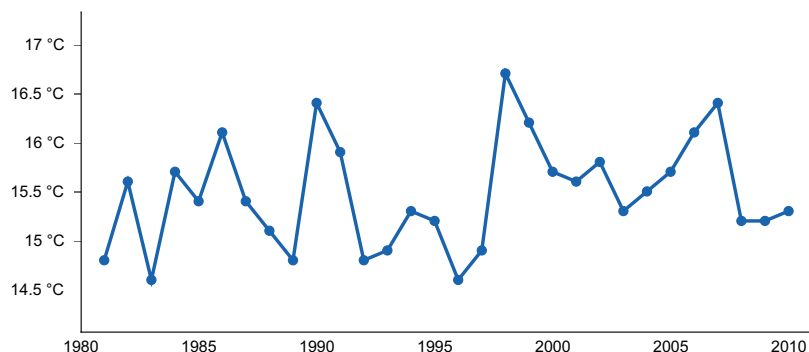


Figure 6. Annual average temperature pattern

Climate stations used

- (1) WEST POINT [USC00018812], Cullman, AL
- (2) BANKHEAD LOCK & DAM [USC00010505], Northport, AL
- (3) JASPER [USC00014226], Jasper, AL
- (4) HANCEVILLE [USC00013655], Hanceville, AL
- (5) SAND MT SUBSTN [USC00017207], Crossville, AL

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: Wynnville, Townley, Sunlight, Sipse, Sequoia, Pottsville, Nectar, Nauvoo, Muse, Montevallo, Enders, Christian, Albertville. They are shallow to very deep, Moderately well drained to Well drained, and Impermeable to Rapid permeable soils, with very acidic to strongly acidic soil reaction, that formed in Marine deposits, Residuum from Interbedded sedimentary rock, Sandstone, Sandstone and shale, Sedimentary rock, Shale, Shale and siltstone, Siltstone.

Table 4. Representative soil features

Parent material	(1) Residuum–interbedded sedimentary rock
Surface texture	(1) Clay loam (2) Fine sandy loam (3) Loam
Drainage class	Moderately well drained to well drained
Permeability class	Rapid
Soil depth	36–168 cm

Available water capacity (Depth not specified)	1.52–19.05 cm
Soil reaction (1:1 water) (Depth not specified)	4.6–5.3

Ecological dynamics

The best approximation of a NatureServe classification for this ecological system as follows:

"Summary: This ecological system consists of *Pinus echinata*- and *Pinus virginiana*-dominated forests in the lower elevation Southern Appalachians and adjacent Piedmont and Cumberland Plateau, extending into the Interior Low Plateau of Indiana, Kentucky and Tennessee. Examples can occur on a variety of topographic and landscape positions, including ridgetops, upper and midslopes, as well as lower elevations (generally below 700 m [2300 feet]) in the Southern Appalachians such as mountain valleys. Examples occur on a variety of acidic bedrock types. Frequent, low-intensity fires coupled with severe fires may have been the sole factor favoring the occurrence of this system instead of hardwood forests in the absence of fire. Under current conditions, stands are dominated by *Pinus echinata* or *Pinus virginiana*. *Pinus rigida* may sometimes be present. Hardwoods are sometimes abundant, especially dry-site oaks such as *Quercus falcata*, *Quercus montana* (= *Quercus prinus*), and *Quercus coccinea*, but also *Carya glabra*, *Acer rubrum*, and others. The shrub layer may be well-developed, with *Gaylussacia baccata*, *Kalmia latifolia*, *Rhododendron minus*, *Vaccinium pallidum*, or other acid-tolerant species most characteristic. Herbs are usually sparse but may include *Pityopsis graminifolia* and *Tephrosia virginiana*."

Classification Approach: International Terrestrial Ecological Systems Classification (ITESC)

Element Description Edition Date: 28Apr2016

Element Description Author(s): M. Schafale, R. Evans, R. White, M. Pyne and C. Nordman

(Accessed February 5, 2019)

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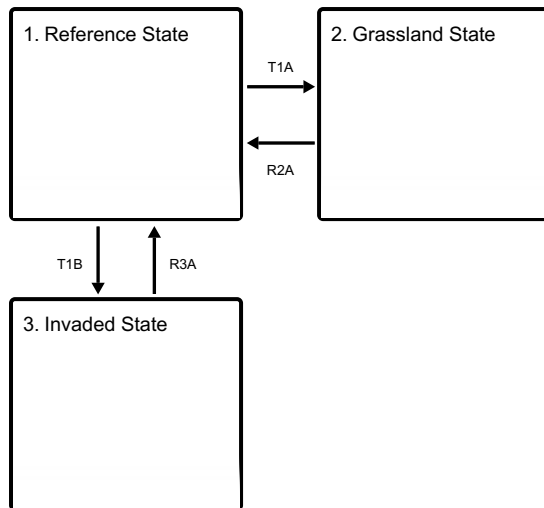
Please note that this is a generalized approximation of the vegetation community that exists in reference conditions on this site. Further investigation is required to determine the extent to which it applies as well as the complexities of vegetation dynamics, including the role of disturbances such as fire.

A brief field visit indicated that pasture is the most common land-use on this site. Where forested, pine dominated but some hardwoods were also noted, including white oak, tulip poplar, blackgum, water oak and sweetgum. Dogwood and sourwood occurred in the mid-story, as did prolific red maple saplings. Water oak was much more common on this site than on others. In the southern ranges of this site, loblolly pine becomes important. Shortleaf pine plantations were common.

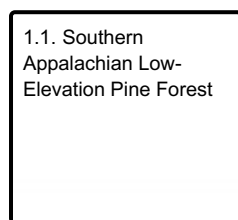
Invasive, non-native plants, especially the privets, were problematic and merit their own alternate invaded state. Any management on this site should consider exotic plant pests.

State and transition model

Ecosystem states



State 1 submodel, plant communities



State 1 Reference State

Community 1.1 Southern Appalachian Low-Elevation Pine Forest

Disturbance likely plays an important role in maintaining these systems but the extent and type could not be determined within the context of this initial description. Future projects should identify the need to refine the description to reflect the role of disturbance.

State 2 Grassland State

Pasture is an important land-use on this site. Species mixes are typical, with fescue being the most common grass.

State 3 Invaded State



Figure 7. Pine plantation invaded by non-native species. Privet is most prolific.

Invasive, non-native plants such as privet pose a threat to this site. They can take over the understory and prevent natural regeneration. If natural regeneration is a goal, they must be considered in any management plan.

Transition T1A

State 1 to 2

Tree clearing, weed control, planting pasture grasses, implementing pasture management best practices

Transition T1B

State 1 to 3

Invasion by non-native pest plants such as privet.

Restoration pathway R2A

State 2 to 1

Abandonment, weed control, tree planting where needed. In some cases, sites will naturally succeed to forest.

Restoration pathway R3A

State 3 to 1

Control of non-native pest plants. Exact recommendations should be stand-based and developed for local conditions.

Additional community tables

Other references

Comer, P., D. Faber-Langendoen, R. Evans, S. Gawler, C. Josse, G. Kittel, S. Menard, C. Nordman, M. Pyne, M. Reid, M. Russo, K. Schulz, K. Snow, J. Teague, and R. White. 2003-present. Ecological systems of the United States: A working classification of U.S. terrestrial systems. NatureServe, Arlington, VA.

Eyre, F. H., editor. 1980. Forest cover types of the United States and Canada. Society of American Foresters, Washington, DC. 148 pp.

McNab, W.H.; Cleland, D.T.; Freeouf, J.A.; Keys, J.E.; Nowacki, G.J.; Carpenter, C.A., comps. 2005. Description of ecological subregions: sections of the conterminous United States [CD-ROM]. Washington, DC: U.S. Department of Agriculture, Forest Service. 80 p.

NatureServe. 2018. NatureServe Explorer: An online encyclopedia of life [web application]. Version 7.1. NatureServe, Arlington, Virginia. Available <http://explorer.natureserve.org>. (Accessed: February 5, 2019).

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.

Contributors

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Approval

Nels Barrett, 9/10/2019

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):**

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):**
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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:

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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