USDA Natural Resources Conservation Service

Ecological site F129XY003WV
Terraces

Last updated: 9/10/2019
Accessed: 05/13/2025

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): 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 245 to1400 feet (75 to 425 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.

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

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 primarily in alluvium on high and intermediate stream terraces associated with major rivers and streams in MLRA 129; some colluvial material is present. . This site is on the line with MLRA 128 and should be

viewed in that context, as it will have much in common with the Ridge and Valley. This PES is largely used for crops, principally corn, burley tobacco, small grains, fruit, sorghum, and hay or pasture.

Reference conditions in this description are inferred due to the highly settled/disturbed nature of this PES. Examples of the reference state have not been discovered in literature searches and existing data resources. Further fieldwork will be required going forward to determine true reference conditions, if they exist on the landscape. This site is of large extent. Most of this area has been cleared. Where forests remain, mixed oak/pine is a reasonable classification. Longleaf pine may be important on this site toward the south in some places.

Associated sites

F129XY001WV	**Floodplains** This site is in floodplains that occur below terraces in the landscape.

Similar sites

F128XY503WV	**Thermic High And Intermediate Stream Terrace Alluvium** This site is in the southern ridge and valley in MLRA 128 but will have many similarities with this site as it occurs on the line between MLRA 128 and MLRA 129. In some cases, there will be overlap between the two.

Table 1. Dominant plant species

Tree	(1) *Quercus* (2) *Pinus*
Shrub	Not specified
Herbaceous	Not specified

Physiographic features

This site occurs primarily in alluvium on high and intermediate stream terraces associated with major rivers and streams in MLRA 129; some colluvial material is present. It is on the line with MLRA 128 (Southern Ridges and Valleys) and should be interpreted within that context as it will have much overlap with that physiographic province.

Table 2. Representative physiographic features

Landforms	(1) Stream terrace (2) Terrace (3) Interfluve
Flooding duration	Brief (2 to 7 days)
Flooding frequency	None to occasional
Elevation	75–425 m
Slope	0–45%
Water table depth	46–168 cm
Aspect	Aspect is not a significant factor

Climatic features

Table 3. Representative climatic features

Frost-free period (characteristic range)	177-194 days
Freeze-free period (characteristic range)	212-224 days
Precipitation total (characteristic range)	1,346-1,397 mm
Frost-free period (actual range)	174-196 days

Freeze-free period (actual range)	208-228 days
Precipitation total (actual range)	1,346-1,397 mm
Frost-free period (average)	186 days
Freeze-free period (average)	218 days
Precipitation total (average)	1,372 mm

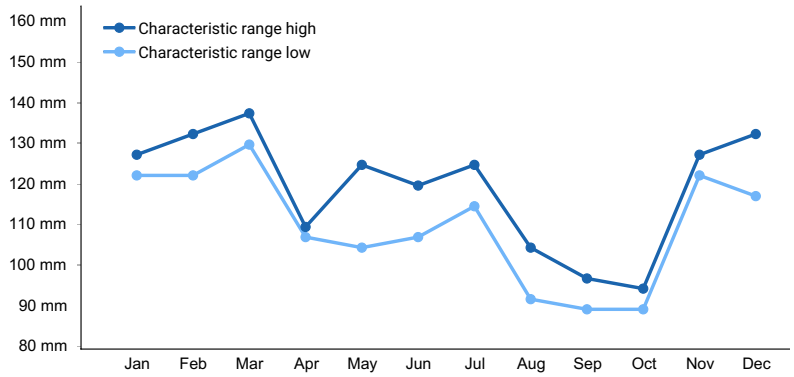


Figure 1. Monthly precipitation range

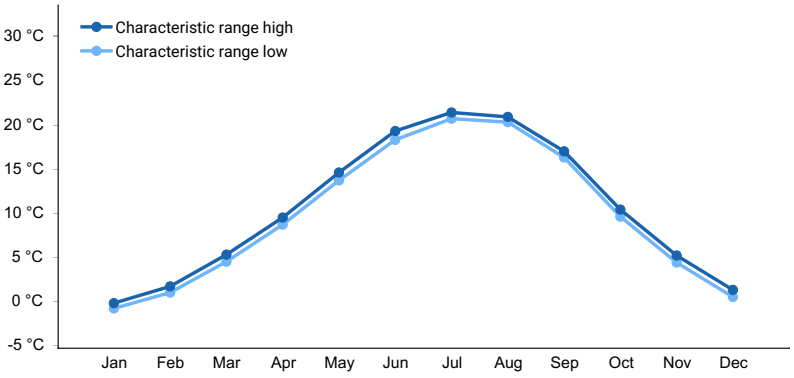


Figure 2. Monthly minimum temperature range

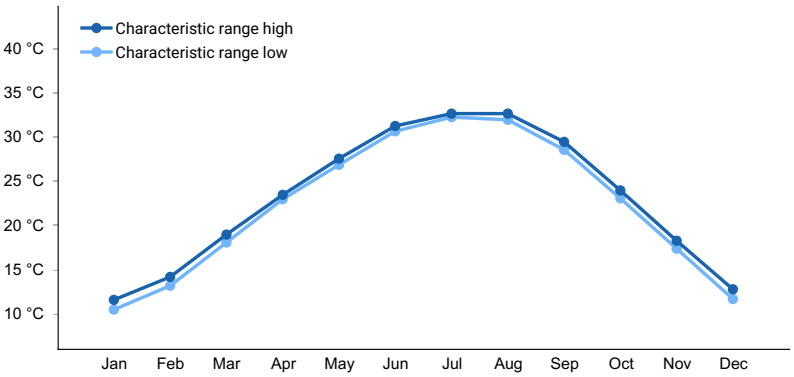


Figure 3. Monthly maximum temperature range

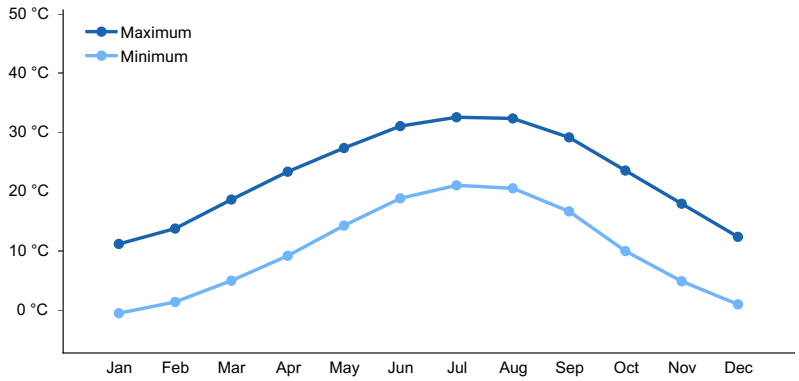


Figure 4. Monthly average minimum and maximum temperature

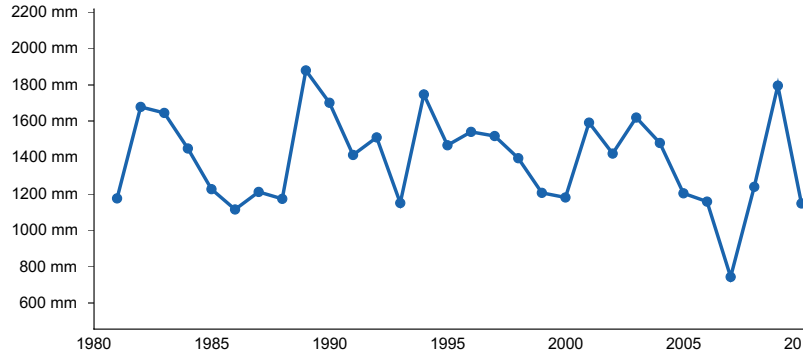


Figure 5. Annual precipitation pattern

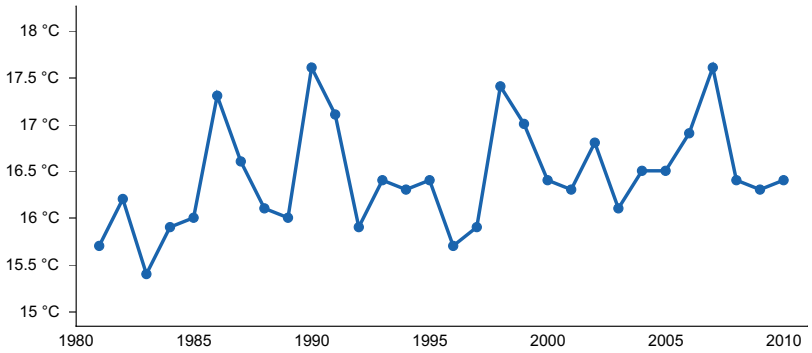


Figure 6. Annual average temperature pattern

Climate stations used

- (1) TALLADEGA [USC00018024], Talladega, AL
- (2) ROME [USC00097600], Rome, GA
- (3) HUNTSVILLE INTL AP [USW00003856], Madison, AL
- (4) CHATTANOOGA LOVELL AP [USW00013882], Chattanooga, TN

Influencing water features

Soils in this PES can have a high water table and are subject to flash flooding in places, following short, high intensity and/or long, sustained rain storms.

Soil features

The soil series associated with this site are: Whitwell, Swafford, Remlap, Jefferson, Docena, and Allen. These soils formed primarily in alluvium on high and intermediate stream terraces associated with major rivers and streams. The slopes range from 0 to 45 percent. They are very deep (more than 60 inches) to bedrock, and are moderately well or well drained. The
available water capacity of these soils is moderate or high. The depth to a seasonal high water table ranges from

1.5 to more than 6 feet. Flooding frequency ranges from none to occasional. They are not subject to ponding. The soil reaction ranges from extremely acid to neutral (pH from 3.5 to 7.3).

Table 4. Representative soil features

Parent material	(1) Alluvium–limestone and shale (2) Colluvium–sandstone and shale
Surface texture	(1) Fine sandy loam (2) Loam (3) Silt loam
Drainage class	Moderately well drained to well drained
Permeability class	Slow to moderately rapid
Soil depth	0–152 cm
Surface fragment cover <=3"	0–25%
Surface fragment cover >3"	0–5%
Available water capacity (0-101.6cm)	9.65–19.3 cm
Soil reaction (1:1 water) (0-101.6cm)	5–5.6
Subsurface fragment volume <=3" (Depth not specified)	0–25%
Subsurface fragment volume >3" (Depth not specified)	0–15%

Ecological dynamics

Information contained in this section was adapted from several sources. The information presented is representative of very complex vegetation communities. Key indicator plants, animals and ecological processes are described to help inform land management decisions. Plant communities will differ across the MLRA because of the naturally occurring variability in weather, soils, and aspect. The reference plant community is an approximation for this site, as very little is known about pre-European conditions and field studies have not been conducted. The species lists are representative and are not botanical descriptions of all species occurring, or potentially occurring, on this site. They are not intended to cover every situation or the full range of conditions, species, and responses for the site.

Where still forested, naturalized vegetation includes oaks, hickories, yellow poplar, beech and shortleaf, Virginia and loblolly pine.

Most areas have been cleared and are used for pasture or for crop or hay production. Crops include principally corn, tobacco, small grains, and truck. Some areas have been developed for residential or urban uses. Other small areas have been planted to pine, or remain in their native vegetation.

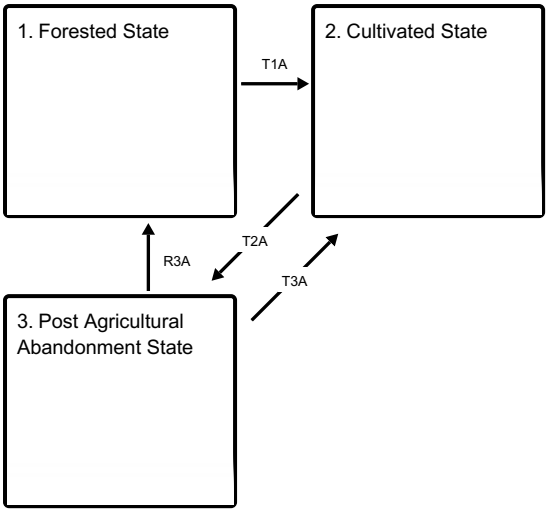
If agricultural land is abandoned, often Virginia pine will colonize in thick stands as part of the natural succession of the site. Virginia pine dominated communities are often on eroded phases of Allen loams.

There is some question about the pre-European settlement condition of this site, as it may have been widely cultivated by Native Americans prior to European civilization.

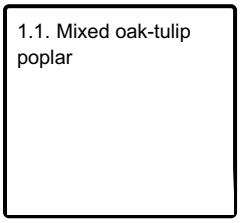
Some of the differences in plant communities may be due to microclimate. Mixed oak/pine is a generalized classification for the time being.

State and transition model

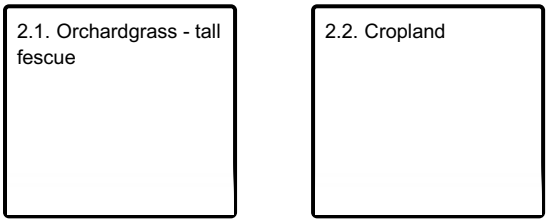
Ecosystem states



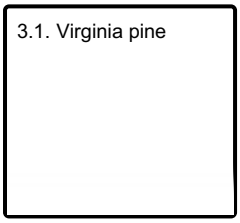
State 1 submodel, plant communities



State 2 submodel, plant communities



State 3 submodel, plant communities



State 1
Forested State

This description is largely based on what might be considered a naturalized state after at least one disturbance due to lack of information on pre-European "reference" conditions. In fact, it is highly likely that a great extent of this site would have been under cultivation by Native Americans and so would have been under human influence long prior to European influence. Young stands dominated by Virginia pine can occur post agricultural abandonment. Older stands can include loblolly pine, sweetgum, elm, white oak, shellbark hickory, black gum, yellow poplar, and southern red oak. Loblolly pine plantations are common.

Community 1.1
Mixed oak-tulip poplar

There is very little existing data on the reference or even naturalized vegetation communities on this site. However, from what is available it can be inferred that forests consist of mixed hardwoods such as oaks, hickories, yellow poplar, beech, and shortleaf, Virginia and loblolly pine. The pines can dominate forests in some areas.

State 2
Cultivated State

Community 2.1
Orchardgrass - tall fescue

These areas are used for hay and pasture. Beef cattle farms are common. Pasture is the most common land-use on this ecological site.

Community 2.2
Cropland

Commonly grown crops include tobacco, corn, truck, small grain, hay, soybeans, and some cotton and tobacco.

State 3
Post Agricultural Abandonment State

The type and extent of effort needed to push this state back to the reference condition varies widely and is dependent on local factors. It could be as simple as allowing natural succession to happen or could require intensive intervention from removing drainage structures to controlling invasive plant species. Pine can dominate this transitional state under the right circumstances.

Community 3.1
Virginia pine

Vegetation responses after agricultural abandonment vary widely on this site and are dependent on a number of localized factors. Whether or not the site has been drained, surrounding land use, type and intensity of past disturbance and proximity to invasive exotic species could all be important drivers. However, Virginia pine has likely formed dense stands on much of this site on abandoned agricultural land. It can be considered natural succession. Disturbances that might impact this community would include wind throw, ice storms and the southern pine beetle.

Transition T1A
State 1 to 2

Forest clearing, establishment of crops or pasture/hay

Transition T2A
State 2 to 3

Abandonment

Restoration pathway R3A
State 3 to 1

Invasive plant control if needed, natural succession, tree planting if desired

Transition T3A
State 3 to 2

Land clearing, establishment of crops or pasture/hay, herbicide where needed

Additional community tables

Other references

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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):**

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):**

15. **Expected annual annual-production (this is TOTAL above-ground annual-production, not just forage annual-production):**

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:**

17. **Perennial plant reproductive capability:**