USDA Natural Resources Conservation Service

Ecological site F129XY001WV
Floodplains

Last updated: 9/10/2019
Accessed: 06/30/2024

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 245 to 1905 feet (75 to 580 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

231C-Southern Cumberland Plateau Section
The terrain is gently sloping tablelands of level-bedded sanstone formations and hilly to mountainous terrain consisting of shale and sandstone slopes forming deep canyons with steep connecting escarpment. Forests are largely oak-pine, loblolly-shortleaf pine, or oak-hickory cover types (McNab et al. 2005).

Ecological site concept

This Provisional Ecological Site (PES) occurs on footslopes and toeslopes in floodplains. Soils are very deep and poorly drained. Permeability is slow to moderately rapid. Slope ranges from 0 - 6%.

Very little is known about the native vegetation on this site because most of it has been cleared in the past. Although quite a bit still exists in forest, those sites have also been disturbed in most cases. The best approximation of native vegetation is water tolerant hardwoods and potentially small river cane breaks. Many areas are now used for pasture/hay and crops.

Associated sites

F129XY003WV	**Terraces**

Similar sites

F125XY004WV	**Floodplain Alluvium**

Table 1. Dominant plant species

Tree	(1) *Liriodendron tulipifera* (2) *Ulmus americana*
Shrub	Not specified
Herbaceous	Not specified

Physiographic features

This site encompasses floodplains in the Sand Mountain Major Land Resource Area (MLRA 129).

Table 2. Representative physiographic features

Flooding frequency	None to frequent
Elevation	245–1,905 ft
Slope	0–6%
Ponding depth	10–15 in
Water table depth	6–60 in

Climatic features

Table 3. Representative climatic features

Frost-free period (characteristic range)	182-190 days
Freeze-free period (characteristic range)	205-218 days
Precipitation total (characteristic range)	55-60 in
Frost-free period (actual range)	178-191 days
Freeze-free period (actual range)	204-232 days
Precipitation total (actual range)	54-60 in
Frost-free period (average)	186 days
Freeze-free period (average)	213 days
Precipitation total (average)	57 in

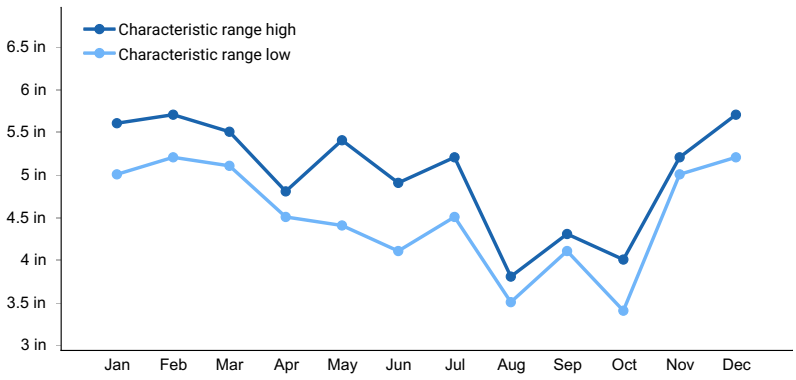


Figure 1. Monthly precipitation range

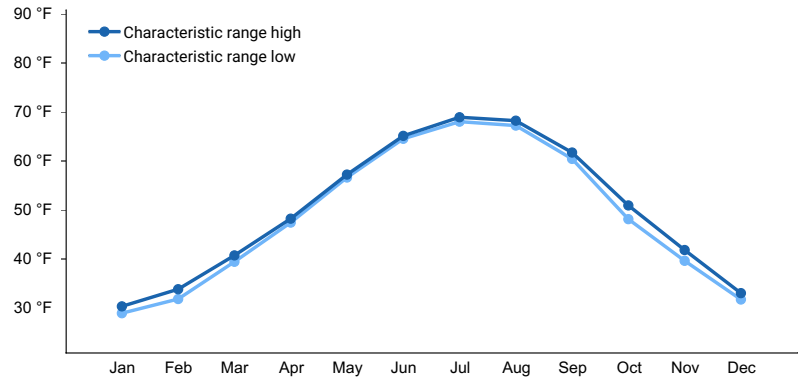


Figure 2. Monthly minimum temperature range

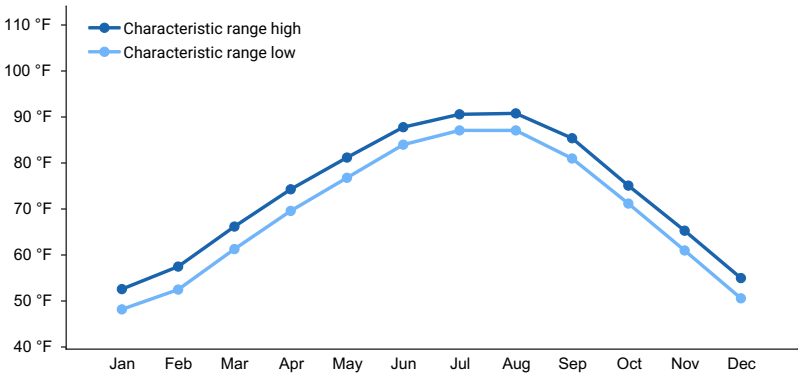


Figure 3. Monthly maximum temperature range

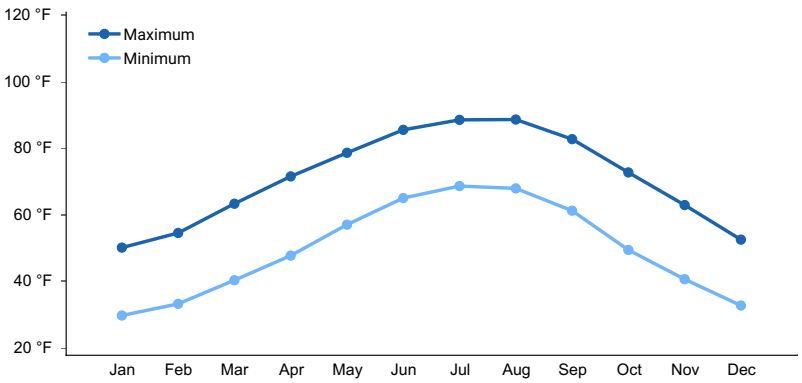


Figure 4. Monthly average minimum and maximum temperature

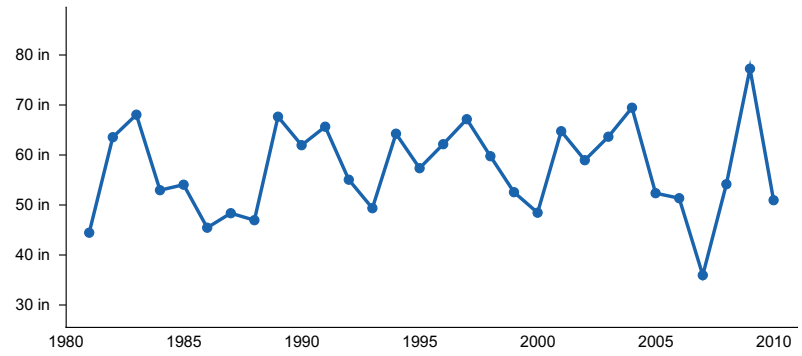


Figure 5. Annual precipitation pattern

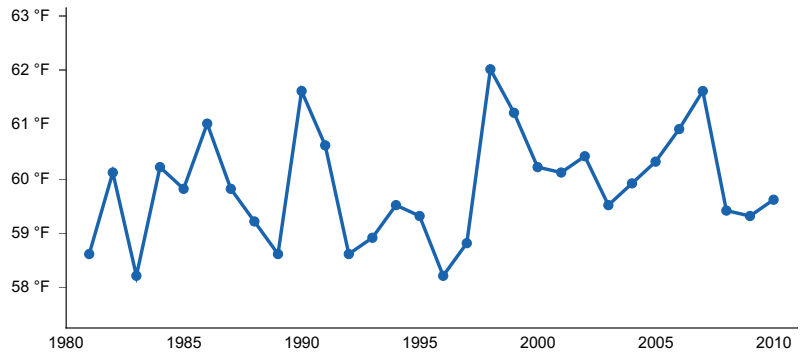


Figure 6. Annual average temperature pattern

Climate stations used

- (1) BANKHEAD LOCK & DAM [USC00010505], Northport, AL
- (2) JASPER [USC00014226], Jasper, AL
- (3) ADDISON [USC00010063], Addison, AL
- (4) SAND MT SUBSTN [USC00017207], Crossville, AL
- (5) LOOKOUT MTN-POINT PARK [USC00405431], Lookout Mountain, TN

Influencing water features

Soil features

The soil series associated with this site are: Whitwell, Tyler, Sterrett, Stendal, Spadra, Sequatchie, Purdy, Pruitton, Pope, Philo, Mooreville, Monongahela, Lickdale, Kirkville, Johnsburg, Crevasse, Cotaco, Choccolocco, Barbourville, Atkins. They are shallow to very deep, Poorly drained to Excessively drained, and Slow to Rapid permeable soils, with very acidic to slighlty acidic soil reaction, that formed in Alluvium, Colluvium from Interbedded sedimentary rock, Limestone, sandstone, and shale, Sandstone and shale, Sandstone and siltstone, Sedimentary rock.

Table 4. Representative soil features

Parent material	(1) Alluvium–sandstone and shale (2) Colluvium–sandstone and siltstone
Surface texture	(1) Loam (2) Sandy loam
Drainage class	Poorly drained to excessively drained
Permeability class	Slow to rapid
Depth to restrictive layer	20–75 in

Ecological dynamics

Very little is known about the reference condition for this PES. It is assumed to be a floodplain forest of mixed, water-tolerant hardwoods but could have been cane break in places. A significant amount of this site has been converted to agriculture, primarily pasture and hay.

An analysis of NatureServe ecological communities indicates that their classification of South-Central Interior Small Stream and Riparian (CES202.706) is most likely the best fit for this site. Their summary description is as follows:

"This system is found throughout the Interior Low Plateau, Southern Ridge and Valley and Cumberland Plateau, Western Allegheny Plateau, lower elevations of the Southern Blue Ridge, and parts of the Cumberlands. Examples occur along small streams and floodplains with low to moderately high gradients. There may be little to moderate floodplain development. Flooding and scouring both influence this system, and the nature of the landscape prevents the kind of floodplain development found on larger rivers. This system may contain cobble bars with

adjacent wooded vegetation and rarely have any marsh development, except through occasional beaver impoundments. The vegetation is a mosaic of forests, woodlands, shrublands, and herbaceous communities."

Element Description Edition Date: 30Jun2016
Element Description Author(s): S. Menard, M. Pyne, R. Evans, R. White, D. Faber-Langendoen, S.C. Gawler, J. Drake

Further investigation in the field is needed to confirm whether this vegetation description is the best/most appropriate fit for this site. For example, it is likely that this site encompasses part of the NatureServe ecological system South-Central Interior Large Floodplain (CES202.705) as well but it cannot be confirmed without field testing. Additionally, because this site occurs almost entirely in Alabama, pine species were important and this was not reflected in the NatureServe description. On the sites investigated, pine species including shortleaf (*Pinus echinata*) and Virginia pine (*Pinus virginiana*) accounted for at least 50% of the overstory. Quercus, primarily white oak (Quercus albe) and water oak (*Quercus nigra*), hickory (Carya) species, American elm (*Ulmus americana*), tuliptree (Liriodendron tuliperifa) and black cherry (*Prunus serotina*) were important hardwood overstory species. Canopy cover can vary within examples of this system. Shrubs and herbaceous layers can vary in richness and cover. Shrubs noted in the field include laurel (Kalmia spp.), which can be quite dense in places. Also of note was yellowroot (*Xanthorhiza simplicissima*), a subshrub known to grow on the edges of streams in sandy soil under a canopy of dappled sunlight. Other shrubs and trees occurring in the midstory were blueberry (Vaccinium spp.), eastern dogwood (*Cornus florida*), red maple (*Acer rubrum*), greenbrier (Smilex spp.), witch hazel (*Hamamelis virginiana*), and wild azalea (*Rhododendron canescens*). The herbaceous layer can be quite diverse throughout this PES and vary significantly depending on site specifics. It is worth noting that differences in species composition (amount and abundance) were noted on different locations within this PES. For example, to the south water oak and shortleaf stands predominated. Likely there will be a need to separate these into smaller scale ecological sites in future projects.

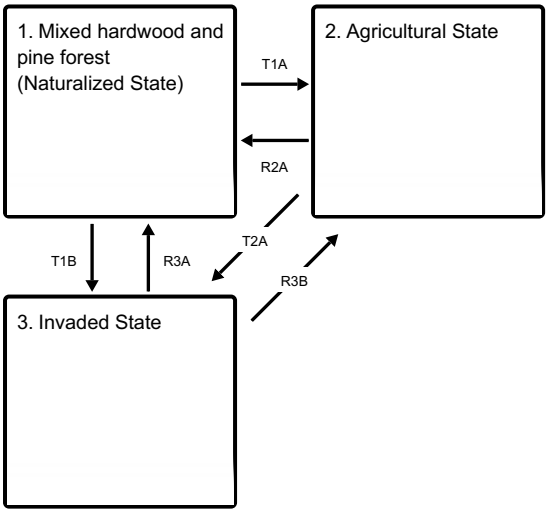
Non-native, invasive plants can become very problematic on this site and can take over if not prevented and/or managed. Species of particular concern include multiflora rose (*Rosa multiflora*), privet (Ligustrum spp.), and Japanese honeysuckle (*Lonicera japonica*). There seems to be a marked difference between the prevalence of these species on this site versus sites in very close proximity but slightly upland.

The vegetation occurring on this site, similar to other PES's, is strongly influenced by the type, degree and extent of past disturbance.

This is a first approximation based on available information and should not be used for management recommendations.

State and transition model

Ecosystem states



State 1
Mixed hardwood and pine forest (Naturalized State)

Figure 7. Naturalized state: Floodplains

Forested floodplains typically consist of water tolerant oaks, red maples, black gum, sweet gum, elm, tulip poplar, shortleaf pine and Virginia pine; with aquatic grasses and sedges in places.

State 2
Agricultural State

Pasture crops are primarily baniagrass, coastal bermudagrass, or fescue grass with a legume. Other crops include corn, soybeans, cotton, and small grains.

State 3
Invaded State

Figure 8. Forest understory invaded by non-native privet species and Japanese honeysuckle

Where previously disturbed, sites can become overrun by non-native, invasive plants. In the worst cases, these sites will not regenerate to naturalized forests unless measures are taken to control the problem plants. The non-native privets are among the worst problem plants on this ecological site.

Transition T1A
State 1 to 2

Pastureland establishment or renovation; vegetation removal (mechanical/chemical); seedbed preparation; planting desired species at appropriate rate. Cropland would be established similarly, by clearing and planting. Soil health should be a consideration.

Transition T1B
State 1 to 3

Mixed hardwood and pine forest (Naturalized State)

Invaded State

Abandonment after disturbance; invasion by non-native, invasive plant species

Restoration pathway R2A
State 2 to 1

In most cases, an abandoned pasture will revert to forest naturally. However, invasive exotic plants are almost always a problem following this type of major disturbance. If desirable, several management practices can improve the chances of restoration to a more native forest state including managing for species adapted/favored to the site; potential planting, competitor control - herbicide and/or mechanical, continual Timber Stand Improvement (TSI), which would require a forest management plan. Cropland can be even more disturbed and restoration practices would have to be site specific and account for past land-use.

Transition T2A
State 2 to 3

Abandonment; introduction (typically unintentional) of non-native, invasive plant species

Restoration pathway R3A
State 3 to 1

Invaded State

Mixed hardwood and pine forest (Naturalized State)

Natural succession or tree planting and subsequent site-specific forest management. Control of invasive, exotic plant species. Control measures should be site-specific based on existing conditions.

Restoration pathway R3B
State 3 to 2

Control of non-native, invasive plant species, clearing; Pastureland or cropland establishment: seedbed preparation; planting desired species at appropriate rates. Invasive plants can be controlled using a number of methods including but not exclusive to mechanical control, chemical control, and if possible, biological control. Each site should be considered individually.

Other references

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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:**

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2. **Presence of water flow patterns:**

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3. **Number and height of erosional pedestals or terracettes:**

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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:**

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17. **Perennial plant reproductive capability:**
