USDA Natural Resources Conservation Service

Ecological site F128XY519WV
Mesic Floodplain Alluvium

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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, 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.

Ecological site concept

This PES occurs in alluvium, and dominantly on flood plains and in upland drainageways in the mesic temperature regime of the southern ridge and valley, MLRA-128. Mixed hardwoods characterize general vegetation (See Community Description).

Table 1. Dominant plant species

Tree	(1) *Liriodendron tulipifera* (2) *Platanus occidentalis*
Shrub	(1) *Lindera benzoin*
Herbaceous	Not specified

Physiographic features

This PES occurs in alluvium, and dominantly on flood plains and in upland drainageways in the mesic temperature regime of the southern ridge and valley, MLRA-128.

Table 2. Representative physiographic features

Landforms	(1) Flood plain (2) Terrace (3) Backswamp
Flooding duration	Long (7 to 30 days)
Flooding frequency	None to frequent
Ponding duration	Very brief (4 to 48 hours) to long (7 to 30 days)
Ponding frequency	None to frequent
Elevation	91–793 m
Slope	0–5%
Ponding depth	0–76 cm
Water table depth	0–193 cm
Aspect	Aspect is not a significant factor

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.

Table 3. Representative climatic features

Frost-free period (average)	147 days
Freeze-free period (average)	180 days
Precipitation total (average)	1,092 mm

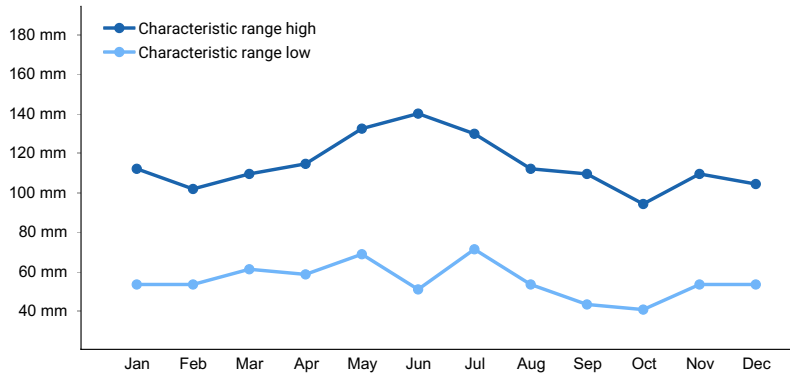

Figure 1. Monthly precipitation range

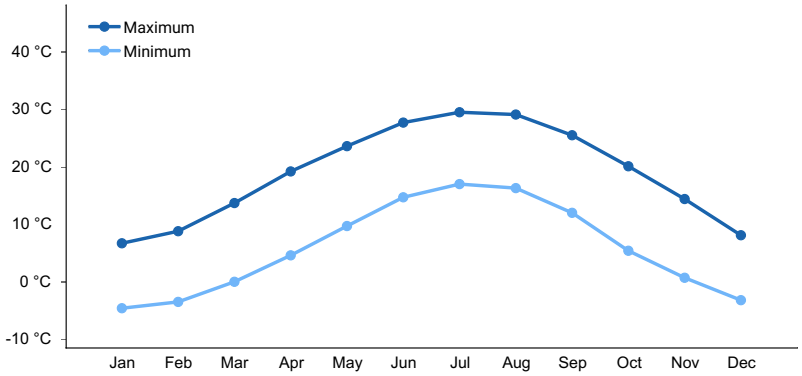

Figure 2. Monthly average minimum and maximum temperature

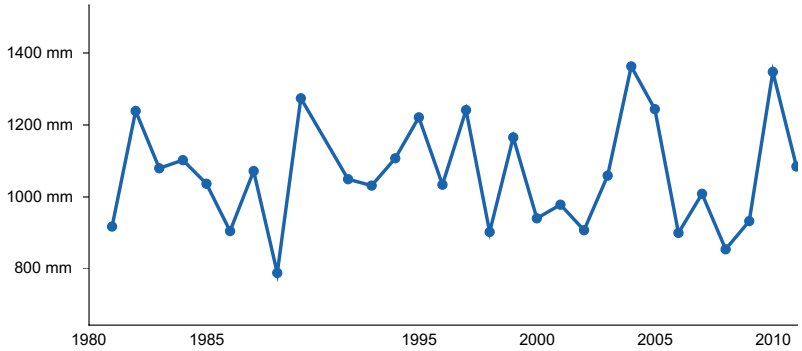

Figure 3. Annual precipitation pattern

Climate stations used

- (1) TAZEWELL [USC00408868], Tazewell, TN
- (2) ROANOKE RGNL AP [USW00013741], Roanoke, VA
- (3) PULASKI 2 E [USC00446955], Pulaski, VA
- (4) WYTHEVILLE 1 S [USC00449301], Wytheville, VA

Influencing water features

This PES probably is affected by water features because it floods and ponds but field investigation is needed to determine the extent of that.

Soil features

These soils formed in alluvium, and dominantly occur on flood plains and in upland drainageways. The slopes range from 0 to 8 percent. They are deep and very deep (40 to more than 60 inches) to bedrock, and range from poorly to excessively drained. The available water capacity of these soils is very low to high. The depth to a seasonal high water table ranges from 0 to more than 6 feet. The frequency of flooding and ponding ranges from none to frequent. The soil reaction ranges from extremely acid to moderately alkaline (pH from 3.5 to 8.4).

The soil series associated with this site are: Atkins, Chagrin, Chavies, Clubcaf, Combs, Craigsville, Derroc, Dunning, Ealy, Emory, Evansham, Gladehill, Grigsby, Gullion, Guthrie, Hamblen, Holly, Irongate, Lindside, Lobdell, Massanetta, Maurertown, Melvin, Newark, Nomberville, Ogles, Pagebrook, Philo, Pope, Purdy, Roane, Robertsville, Ross, Sindion, Speedwell, Weaver, Wolfgap

Parent Material Kind: alluvium, colluvium, loess, residuum

Parent Material Origin: granite and gneiss; igneous, metamorphic and sedimentary; interbedded sedimentary; limestone and sandstone; limestone and shale; limestone and siltstone; limestone, cherty; limestone, sandstone and shale; limestone, unspecified; metasedimentary, unspecified; phyllite; quartzite; sandstone and shale; sandstone and siltstone; sandstone, unspecified; schist, unspecified; shale and siltstone; shale, acid; shale, unspecified; siltstone, unspecified

Table 4. Representative soil features

Parent material	(1) Alluvium–granite (2) Colluvium–gneiss (3) Loess–limestone and sandstone
Surface texture	(1) Cobbly clay loam (2) Gravelly fine sandy loam (3) Very cobbly loam
Drainage class	Poorly drained to excessively drained
Permeability class	Very slow to rapid
Soil depth	61–203 cm
Surface fragment cover <=3"	0–8%
Surface fragment cover >3"	0–8%
Available water capacity (0-101.6cm)	5.33–22.1 cm
Soil reaction (1:1 water) (0-101.6cm)	4.6–7.3
Subsurface fragment volume <=3" (Depth not specified)	0–41%
Subsurface fragment volume >3" (Depth not specified)	0–55%

Ecological dynamics

It loosely correlates to Smalley's (1982) landtype classification #15: Terraces, Streambottoms, and Depressions with Poor Drainage. His landtype classification includes Bonair and Atkins soils series, also included in this PES. Vegetation is listed as: maple, sweetgum, blackgum, yellow-poplar, white oak, American sycamore, and loblolly pine. Shrubs and small trees include viburnums, azaleas, mountain laurel, American holly, cane, sphagnum moss, alder, dogwood, buckthorn, strawberry bush, Virginia-willow, and sedges (common in the understory). Site index for natural stands: loblolly pine = 85; cottonwood = 105; bottomland oaks = 90; yellow poplar = 90; sweetgum = 90. Cottonwood, willow oak , water oak and sweetgum are listed as species that are the most desirable.

Smalley (1982) characterized Landtypes in this area. Pope and Philo soil series area included in Landtype 14: Footslopes, Terraces, and Streambottoms with Good Drainage. Vegetation is cited as white oak, yellow poplar, red maple, blackgum, sweetgum, black oak, and loblolly pine. Smaller trees and shrubs include dogwood, sassafras, sourwood, serviceberry, blue-beech, mountain laurel, viburnums, strawberry bush, devils walkingstick, striped maple, azaleas, cane, and American holly. For natural stands eastern white pine is listed as having a site index of 90. Shortleaf pine is listed at 80; loblolly = 80; yellow poplar = 100. It's unclear how tight the relationship is between this PES and Smalley's landtype but most concepts can probably be applied.

DeSelm had five plots on this PES. Averages of those data suggest that eastern hemlock, white oak and tulip poplar were among the most important overstory species. White pine was also important. Rhus radicans, *Smilax rotundifolia*, *Parthenocissus quinquefolia*, and *Euonymus americanus* were important shrub/vine species. Sunflowers, violets and asters were commonly noted in the understory.

State and transition model

Other references

DeSelm, Hal. 1989 – 2009. Natural Terrestrial Vegetation of Tennessee (Vegetation Plot Data). Unpublished raw data. http://treeimprovement.utk.edu/DeSelmData/DataDSC.htm

Griffith, G.E., Omernik, J.M., and Azevedo, S.H., 1997, Ecoregions of Tennessee: Corvallis, Oregon, U.S. Environmental Protection Agency EPA/600R-97/022, 51 p.

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

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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:**

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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):**

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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:**
