USDA Natural Resources Conservation Service

Ecological site PX136X00X810
Acidic upland forest, seasonally wet

Accessed: 05/05/2024

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): 136X–Southern Piedmont

This area is in North Carolina (29 percent), Georgia (27 percent), Virginia (21 percent), South Carolina (16 percent), and Alabama (7 percent). It makes up about 64,395 square miles (166,865 square kilometers). (Ag Bulletin 296)

The northeast-southwest trending Piedmont ecoregion comprises a transitional area between the mostly mountainous ecoregions of the Appalachians to the northwest and the relatively flat coastal plain to the southeast. It is a complex mosaic of Precambrian and Paleozoic metamorphic and igneous rocks with moderately dissected irregular plains and some hills. (EPA Ecoregions descriptions)

ADD APPROPRIATE ECOREGION DESCRIPTION(S)

Classification relationships

A PROVISIONAL ECOLOGICAL SITE is a conceptual grouping of soil map unit components within a Major Land Resource Area (MLRA) based on the similarities in response to management. Although there may be wide variability in the productivity of the soils grouped into a Provisional Site, the soil vegetation interactions as expressed in the State and Transition Model are similar and the management actions required to achieve objectives, whether maintaining the existing ecological state or managing for an alternative state, are similar. Provisional Sites are likely to be refined into more precise group during the process of meeting the APPROVED ECOLOGICAL SITE DESCRIPTION criteria.

This PROVISIONAL ECOLOGICAL SITE has been developed to meet the standards established in the National Ecological Site Handbook. The information associated with this ecological site does not meet the Approved Ecological Site Description Standard, but it has been through a Quality Control and Quality Assurance processes to assure consistency and completeness. Further investigations, reviews and correlations are necessary before it becomes an Approved Ecological Site Description.

Ecological site concept

This ecological site is thought to occur more often on north-facing slopes.

This association represents the more typical mesic mixed hardwood forest of the Piedmont from North Carolina to Georgia. The canopy of is dominated by mesophytic trees. The herb layer is often moderately dense and diverse, though it may be sparse under heavy shade. Exact composition varies locally with slope position and nature of soil.

Under natural conditions these forests are uneven-aged, with old trees present. Reproduction occurs primarily in canopy gaps. Rare, severe natural disturbances such as wind storms may allow pulses of increased regeneration and allow the less shade-tolerant species to remain in the community. However, Skeen, Carter, and Ragsdale (1980) argued that even the shade-intolerant Liriodendron could reproduce enough in gaps to persist in the climax Piedmont forests (Schafale and Weakley 1990).

The natural fire regime of the Piedmont is not known but fires certainly occurred periodically. Because Mesic Mixed Hardwood Forests generally occur in moist and topographically sheltered sites, they probably burned only rarely and with low intensity (Schafale and Weakley 1990).

Disturbed areas have increased amounts of pines and weedy hardwoods such as *Liriodendron tulipifera* and *Liquidambar styraciflua*. Many areas have been selectively cut many times and have increased importance of *Fagus grandifolia* and other noncommercial hardwoods relative to oaks (Schafale and Weakley 1990). Other areas that were disturbed in the distant past may be younger and, therefore, may have a higher proportion of oaks with beeches mainly in the understory.

Table 1. Dominant plant species

Tree	(1) *Fagus grandifolia* (2) *Quercus rubra*
Shrub	(1) *Polystichum acrostichoides*
Herbaceous	(1) *Hexastylis virginica*

Legacy ID

F136XY810SC

Physiographic features

Most of MLRA 136 is in the Piedmont Upland Section of the Piedmont Province of the Appalachian Highlands. A very small part of the MLRA, in central North Carolina, is in the Atlantic Plain Division. A very small part in the Roanoke, Virginia, area is on the eastern edge of the Blue Ridge Province of the Appalachian Highlands. This MLRA is a rolling to hilly upland with a well-defined drainage pattern. The original plateau has been dissected by streams, resulting in narrow to fairly broad upland ridgetops and short slopes. Valley floors are very narrow, and stream terraces are minor. Elevation ranges from 330 to 1,310 feet (100 to 400 m), increasing gradually from south to north.

Geology:
Precambrian and Paleozoic metamorphic and igneous rocks underlie almost all of this MLRA. The dominant metamorphic rock types include biotite gneiss, schist, slate, quartzite, phyllite, and amphibolite. The dominant igneous rock types are granite and metamorphosed granite. Some gabbro and other mafic igneous rocks also occur, and diabase dikes are not uncommon. The Carolina Slate terrane occurs just east of an imaginary centerline in this MLRA. It consists of metamorphic rocks with some metavolcanics and metasediments. Scattered graben basins, which are bounded by faults where the ground between the faults has dropped down, occur from South Carolina to south of Charlottesville and Richmond, Virginia. These basins have Triassic and Jurassic siltstone, shale, sandstone, and mudstone. River valleys have recent alluvium and few terraces.

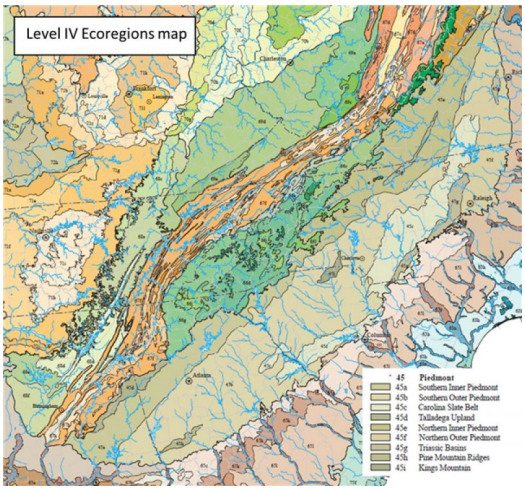

Figure 1. EPA Level IV Ecoregions map.

Table 2. Representative physiographic features

Landforms	(1) Hill (2) Ridge (3) Interfluve
Flooding frequency	None
Ponding frequency	None
Slope	2–25%
Water table depth	6–40 in

Climatic features

This ecological site occurs in the thermic temperature regime for MLRA 136. The thermic soil temperature regime has mean annual soil temperatures of 15° C or more, but less than 22 °C; and a difference between mean summer and mean winter soil temperatures of greater than 5 °C at 50 cm below the surface.

The average annual precipitation is 45 to 60 inches (1,145 to 1,525 millimeters) and is as much as 75 inches (1,905 millimeters) in a small, high-elevation area in northeastern Georgia. The precipitation generally is evenly distributed throughout the year. It is lowest in autumn. Most of the rainfall occurs as high-intensity, convective thunderstorms during the growing season. Significant moisture also comes from the movement of warm and cold fronts across the MLRA from November to April. High amounts of rain can occur during hurricanes at the same time of the year. Snowfall typically is light. The average annual temperature is 53 to 64 degrees F (12 to 18 degrees C). The freeze-free period averages 230 days and ranges from 185 to 275 days. Both the mean annual temperature and length of the freeze-free period increase from north to south and with decreasing elevation.

Table 3. Representative climatic features

Frost-free period (average)	195 days
Freeze-free period (average)	225 days
Precipitation total (average)	52 in

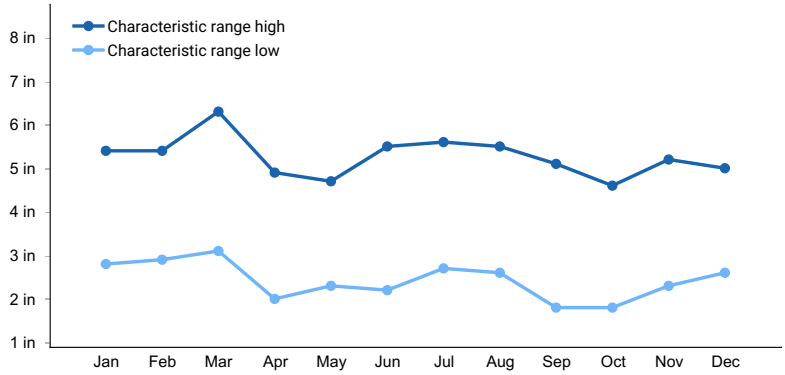

Figure 2. Monthly precipitation range

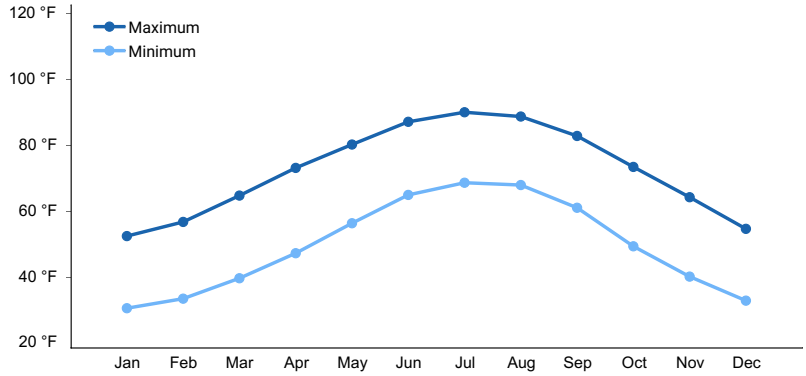

Figure 3. Monthly average minimum and maximum temperature

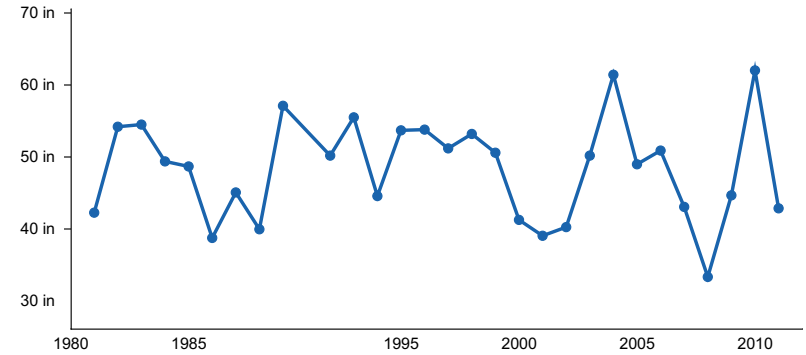

Figure 4. Annual precipitation pattern

Climate stations used

- (1) EXPERIMENT [USC00093271], Griffin, GA
- (2) ASHEBORO 2 W [USC00310286], Asheboro, NC
- (3) CHESNEE 7 WSW [USC00381625], Chesnee, SC
- (4) CLEMSON UNIV [USC00381770], Clemson, SC
- (5) GREENWOOD [USC00383754], Greenwood, SC
- (6) CROZIER [USC00442142], Maidens, VA
- (7) ATHENS BEN EPPS AP [USW00013873], Athens, GA
- (8) DALLAS 7 NE [USC00092485], Dallas, GA
- (9) SILER CITY 2 N [USC00317924], Siler City, NC
- (10) CHASE CITY [USC00441606], Chase City, VA
- (11) HICKORY FAA AP [USW00003810], Hickory, NC
- (12) CARROLLTON [USC00091640], Carrollton, GA
- (13) COVINGTON [USC00092318], Covington, GA
- (14) ALBEMARLE [USC00310090], Albemarle, NC
- (15) NEWBERRY [USC00386209], Newberry, SC
- (16) COLUMBUS METRO AP [USW00093842], Columbus, GA
- (17) ASHLAND 3 ENE [USC00010369], Ashland, AL
- (18) ROCKFORD 3 ESE [USC00017020], Rockford, AL
- (19) GAINESVILLE [USC00093621], Gainesville, GA
- (20) MILLEDGEVILLE [USC00095874], Milledgeville, GA
- (21) WEST POINT [USC00099291], Lanett, GA
- (22) SALISBURY [USC00317615], Salisbury, NC
- (23) SIMMS WTP [USC00387885], Chesnee, SC
- (24) CHARLOTTE DOUGLAS AP [USW00013881], Charlotte, NC

Influencing water features

Soil features

Soils associated with this ecological site fall within the thermic soil temperature regime of MLRA 136. The thermic soil temperature regime is defined as having a difference in soil temperature of 6 degrees C or more between mean summer (June, July, and August in the Northern Hemisphere) and mean winter (December, January, and February in the Northern Hemisphere) and a mean annual soil temperature of:15 degree C (59 degrees F) to 22 degrees C (72 degrees F). Soils belong to the Ultisols order and are moderately well drained or somewhat poorly drained. They are in a fine, fine-loamy, or fine-silty particle size family. Most components do not have a restrictive layer, but some components have a restriction within 100 cm (40 inches). Representative components are the Abell, Bourne, Bush River, Cataula, Cid, Helena, Kirksey, Mattaponi, and Prosperity soil series.

Table 4. Representative soil features

Surface texture	(1) Gravelly sandy loam (2) Stony loam (3) Fine sandy loam
Drainage class	Somewhat poorly drained to moderately well drained
Permeability class	Moderate to very slow
Soil depth	20 in
Available water capacity (0-40in)	2–10 in
Calcium carbonate equivalent (0-40in)	0%
Electrical conductivity (0-40in)	0 mmhos/cm
Sodium adsorption ratio (0-40in)	0
Soil reaction (1:1 water) (0-40in)	4–6.5
Subsurface fragment volume <=3" (Depth not specified)	0–35%

Ecological dynamics

Disturbed areas have increased amounts of pines and weedy hardwoods such as *Acer rubrum*, *Liriodendron tulipifera*, and *Liquidambar styraciflua*, with the amounts depending on the degree of canopy opening. Areas that were cultivated are generally dominated by even-aged pine stands which are replaced by the climax oaks and hickories only as the pines die. Logged areas may have a mixture of hardwoods and pines (Schafale and Weakley 1990). Under natural conditions, these forests are uneven-aged, with old trees present. Reproduction occurs primarily in canopy gaps. Rare, severe natural disturbances such as wind storms may allow pulses of increased regeneration and allow the less shade-tolerant species to remain in the community. However, Skeen et al. (1980) argued that even the shade-intolerant Liriodendron could reproduce enough in gaps to persist in the climax Piedmont forests. The natural fire regime of the Piedmont is not known, but fires certainly occurred periodically. Most of the component trees are able to tolerate light surface fires with little effect. In addition, the recruitment of oaks and hickories generally benefits from periodic fires. However, *Acer rubrum* is fairly intolerant of fire (especially when young) and often appears to be out-competing the regeneration of oaks in long-unburned stands. In Virginia, *Fagus grandifolia* and *Ilex opaca* var. opaca are additional thin-barked, fire-intolerant species that have invaded many fire-suppressed oak-hickory forests. Regular fire may have created a more open forest, with gaps persisting longer than at present and perhaps forming more frequently (Schafale and Weakley 1990).

State and transition model

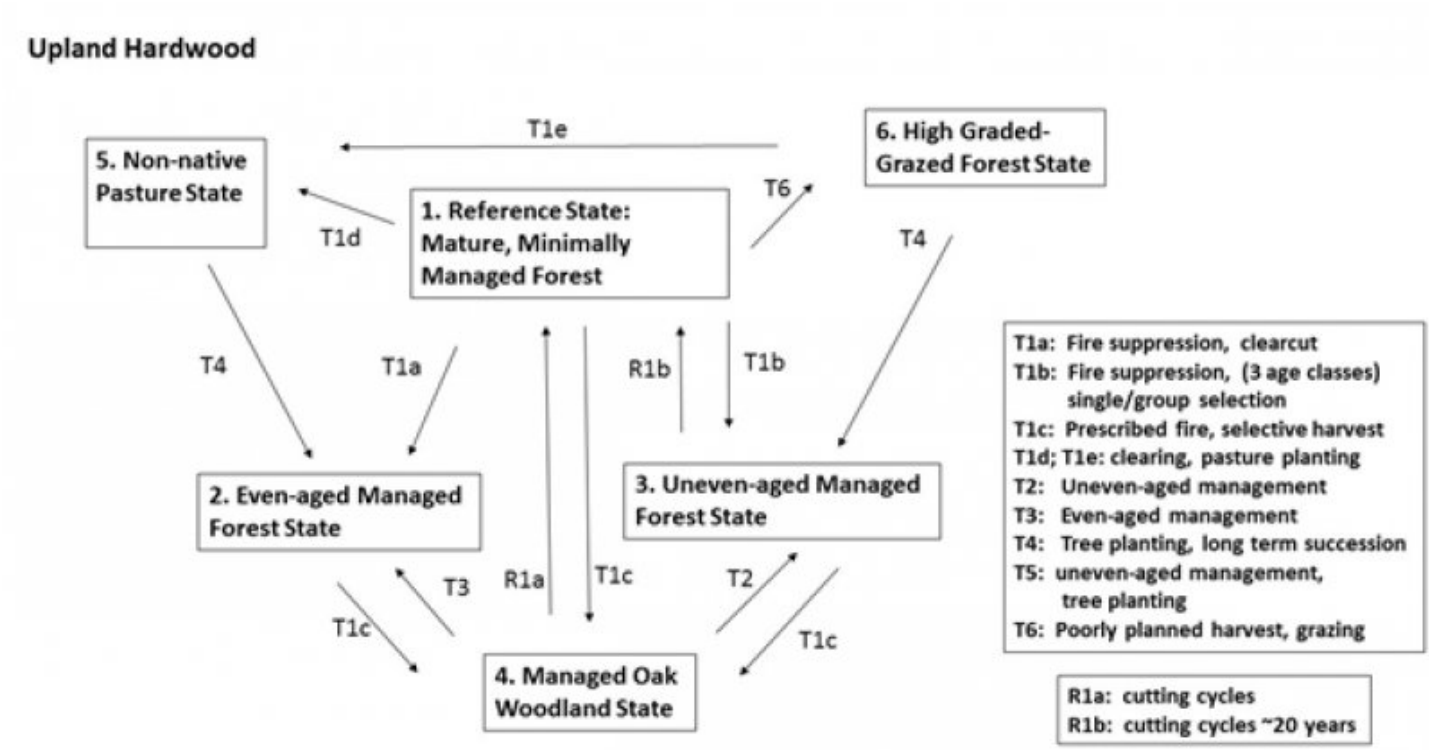

Figure 6. state and transition model

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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:**

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):**

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8. **Soil surface (top few mm) resistance to erosion (stability values are averages - most sites will show a range of values):**

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9. **Soil surface structure and SOM content (include type of structure and A-horizon color and thickness):**

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10. **Effect of community phase composition (relative proportion of different functional groups) and spatial distribution on infiltration and runoff:**

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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:

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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:**