

Ecological site PX136X00X130

Mesic temperature regime, flood plain levee forest, sandy

Accessed: 04/25/2024

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 occurs on natural levees and excessively drained floodplains. Generally these are rivers where the floodplain is wide but may also include well-developed levees in the broad floodplains of smaller creeks in Triassic basins. Soils are sandy and generally very fertile. Flooding is fairly frequent but generally of short duration. Soils are well-drained or excessively drained when not flooded.

Table 1. Dominant plant species

| | |
|------------|------------------------------------|
| Tree | (1) <i>Liriodendron tulipifera</i> |
| Shrub | (1) <i>Asimina triloba</i> |
| Herbaceous | (1) <i>Arundinaria gigantea</i> |

Legacy ID

F136XY130NC

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.

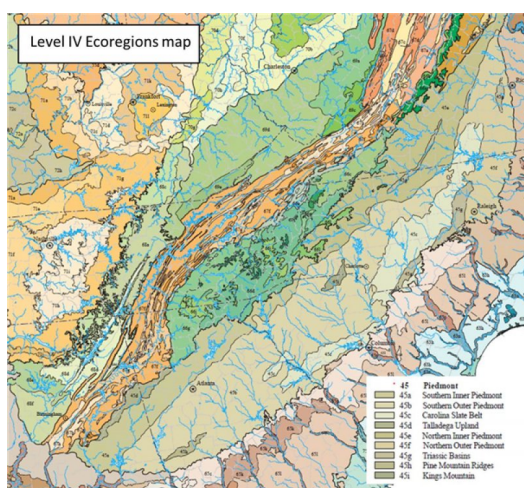


Figure 1. EPA Level IV Ecoregion map.

Table 2. Representative physiographic features

| | |
|--------------------|------------------------------------|
| Landforms | (1) Drainageway (2) Flat |
| Flooding frequency | Occasional to frequent |
| Ponding frequency | None |
| Slope | 0–5% |
| Water table depth | 57 in |
| Aspect | Aspect is not a significant factor |

Climatic features

The average annual precipitation is 37 to 45 inches (940 to 1,145 millimeters) at the northern end of this area, is 45 to 60 inches (1,145 to 1,525 millimeters) at the southern end, 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) | 174 days |
| Freeze-free period (average) | 198 days |
| Precipitation total (average) | 48 in |

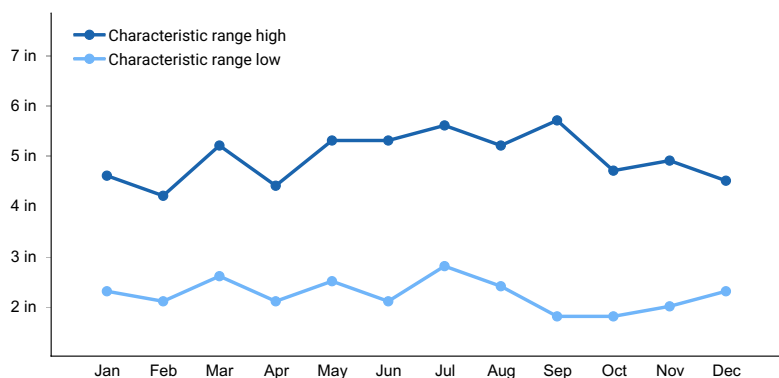


Figure 2. Monthly precipitation range

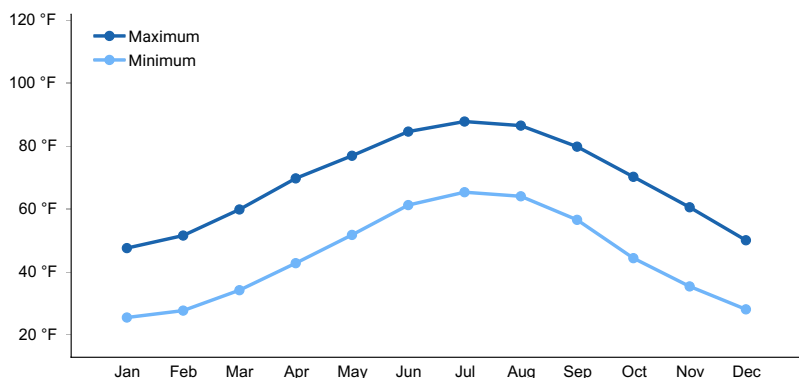


Figure 3. Monthly average minimum and maximum temperature

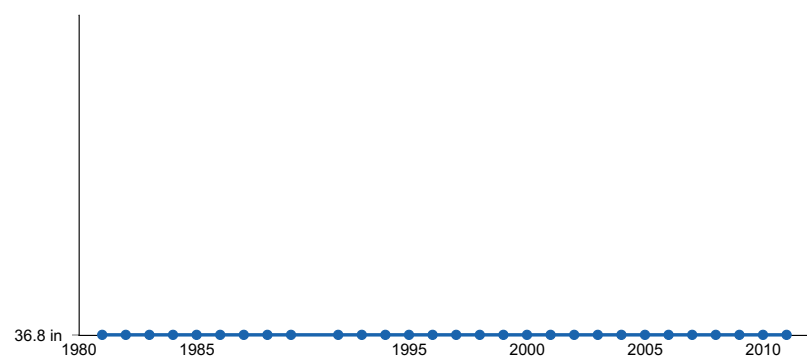


Figure 4. Annual precipitation pattern

Climate stations used

- (1) LOUISA [USC00445050], Louisa, VA
- (2) ROCKY MT [USC00447338], Rocky Mount, VA

- (3) FOREST CITY 6 SW [USC00313150], Forest City, NC
- (4) SHELBY 2 NNE [USC00317845], Shelby, NC
- (5) BROOKNEAL [USC00441082], Brookneal, VA
- (6) TYE RIVER 1 SE [USC00448600], Amherst, VA
- (7) HICKORY FAA AP [USW00003810], Hickory, NC
- (8) YADKINVILLE 6 E [USC00319675], East Bend, NC
- (9) CROZIER [USC00442142], Maidens, VA
- (10) MARTINSVILLE FLTR PLT [USC00445300], Martinsville, VA
- (11) WASHINGTON DC DULLES AP [USW00093738], Chantilly, VA
- (12) GASTONIA [USC00313356], Gastonia, NC
- (13) LENOIR [USC00314938], Lenoir, NC
- (14) APPOMATTOX [USC00440243], Appomattox, VA
- (15) PALMYRA 3S [USC00446491], Palmyra, VA

Influencing water features

The extent of the major Hydrologic Unit Areas (identified by four-digit numbers) that make up this MLRA is as follows: Edisto-Santee (0305), 18 percent; Chowan-Roanoke (0301), 14 percent; Apalachicola (0313), 10 percent; Pee Dee (0304), 10 percent; Ogeechee-Savannah (0306), 10 percent; Alabama (0315), 9 percent; Altamaha-St. Marys (0307), 9 percent; Lower Chesapeake (0208), 9 percent; Neuse-Pamlico (0302), 5 percent; Cape Fear (0303), 5 percent; and Potomac (0207), 1 percent. Some of the major rivers in this MLRA are, from north to south, the Roanoke, Cape Fear, Savannah, Altamaha, Chattahoochee, and Alabama Rivers. These rivers typically form within the Piedmont Province and flow east and south across the Coastal Plain Province and empty into the Atlantic Ocean or Gulf of Mexico.

Soil features

Soils associated with this ecological site occur in the mesic soil temperature regime of MLRA 136. This soil temperature regime is defined as: The mean annual soil temperature is 8 degree C or higher but lower than 15 degrees C, and the difference between mean summer and mean winter soil temperatures is 6 degrees C or more either at a depth of 50 cm below the soil surface or at a densic, lithic, or paralithic contact, whichever is shallower. These soils occur on flood plains and natural levees and are excessively to well drained. They have rapid to very rapid permeability due to the sandy textures throughout. Dominant components are the Ronda and Biltmore soil series.

Table 4. Representative soil features

| | |
|---------------------------------------|-------------------------------------|
| Surface texture | (1) Loamy sand (2) Sand |
| Family particle size | (1) Sandy |
| Drainage class | Well drained to excessively drained |
| Permeability class | Rapid to very rapid |
| Soil depth | 60 in |
| Surface fragment cover <=3" | 0–9% |
| Available water capacity (0-40in) | 3–6 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) | 5–6.2 |

Ecological dynamics

Flooding, deposition and loss of alluvial material, and windthrow result in a constantly changing environment. Floods disturb vegetation by washing away plants and soil. In more severe floods, small parts of the forest may be eroded or completely washed away. The tendency of streamside trees to lean toward the river has both positive and negative consequences. Leaning trees gain access to higher light levels that potentially increase growth rates, but because a greater part of their trunks are immersed in fast running water during heavy floods, they are particularly susceptible to being uprooted and washed away. Prolonged flooding can also stress or kill flood plain trees. Most flood plain trees can tolerate short periods of flooding, but few species can handle prolonged flooding during the growing season.

Flood plains are continually dynamic with the deposition of new sediment and the loss of old sediment. Sandbars and mudflats form on the inside curves of rivers, and regular flooding deposits alluvial material. Flood plain soils consist of alluvium that can range from 15 to 250 feet thick. Heavy mud deposition during the growing season kill herbaceous plants and the seedlings and saplings of woody plants.

Storms, tornadoes, and occasional hurricanes can cause considerable wind damage. Shallow root systems allow flood plain trees to use the uppermost soil region, where anaerobic conditions are less likely, but make them more vulnerable to windthrow. Trunks of wind-toppled trees often lie scattered across flood plains. The openings created by downed trees increase the abundance and diversity of herbaceous plants and facilitate forest regeneration. Today, flood plain forests exist in various stages of succession following tree removal. Very few tracts with old-growth trees are known.

State and transition model

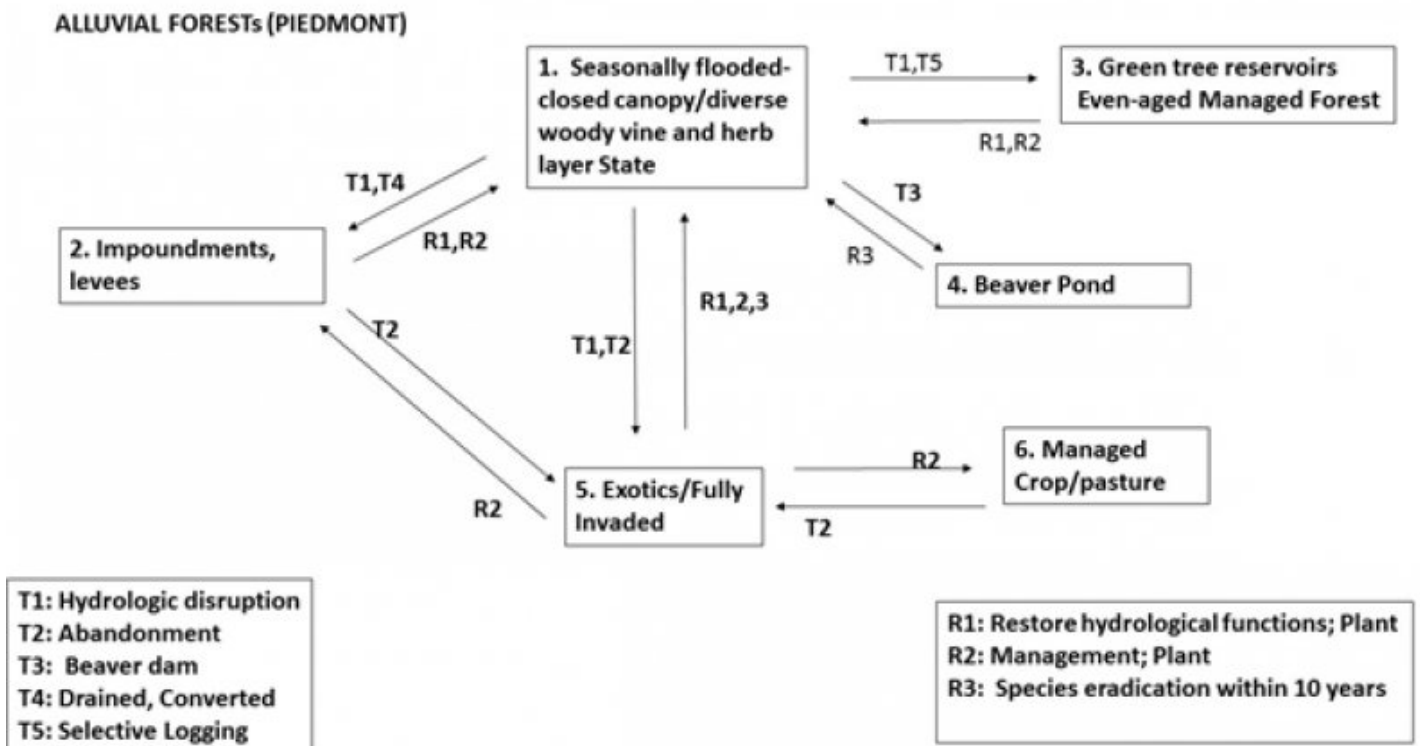


Figure 6. state and transition model

Other references

Edwards, L., J. Ambrose, and L.K. Kirkman. 2013. The Natural Communities of Georgia. The University of Georgia Press. Athens and London.

Environmental Protection Agency (EPA). 2004. Level III and IV Ecoregions of EPA Region 4. U.S. Environmental Protection Agency, National Health and Environmental Effects Research Laboratory. Western Ecology Division, Corvallis, Oregon. Scale 1:2,000,000.

Fleming, Gary P. and Karen D. Patterson. 2013. Natural Heritage Report 13-16. Natural Communities of Virginia:

Ecological Groups and Community Types. Virginia Department of Conservation and Recreation, Division of Natural Heritage, Richmond, Virginia. 36 pages.

NatureServe. 2013. NatureServe Explorer: An online encyclopedia of life [web application]. Version 7.1. NatureServe, Arlington, Virginia. Available <http://www.natureserve.org/explorer>. (Accessed May 24, 2013).

Nelson, John B. 1986. The natural Communities of South Carolina: Initial Classification and Description. South Carolina Wildlife and Marine Resources Department.

Spira, Timothy P. 2011. Wildflowers and Plant Communities of the Southern Appalachian Mountains and Piedmont. The University of North Carolina Press. Chapel Hill.

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.

Wharton, C.H. 1978. The natural environments of Georgia. Bulletin 114. Georgia Department of Natural Resources. Atlanta.

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:
