

Ecological site F122XY017KY Moist Alluvium

Accessed: 05/18/2024

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): 122X–Highland Rim and Pennyroyal

MLRA 122 is in Tennessee (47 percent), Kentucky (43 percent), Indiana (7 percent), and Alabama (3 percent). It makes up about 21,530 square miles (55,790 square kilometers).

SOILS:

Many of the soils in this MLRA are Udalfs. The moderately deep to very deep, well drained, clayey soils formed in limestone residuum. They are dominantly in rolling to steep areas of the “Outer Basin” (Mimosa, Braxton, Gladdice, and Hampshire series) and the undulating to hilly areas of the “Inner Basin” (Talbot and Bradyville series). The most agriculturally productive soils are the very deep, well drained, clayey or loamy soils that formed in alluvium and/or loess over alluvium or limestone residuum in nearly level to undulating areas (Armour, Cumberland, Harpeth, Lomond, and Maury series). The less extensive soils generally are moderately well drained to somewhat poorly drained and formed in loamy or clayey alluvium and/or residuum (Byler, Capshaw, Colbert, and Tupelo series). This MLRA has a significant acreage of Mollisols. Shallow or moderately deep, well drained, clayey Udolls (Ashwood and Barfield series) formed in limestone residuum dominantly in rolling to steep areas. Very shallow, well drained, clayey Rendolls (Gladeville series) formed in limestone residuum dominantly in undulating to rolling areas of the “Inner Basin.” Very deep, well drained or moderately well drained Udolls (Arrington, Egam, Lynnvill, and Staser series) and somewhat poorly drained or poorly drained Aquolls (Agee, Godwin, and Lanton series) formed in loamy or clayey alluvium derived from limestone on flood plains. Most of the remaining soils on flood plains are moderately well drained or well drained Udepts (Lindell and Ocana series). Udupts are of small extent in this area. Most are very deep, well drained, and loamy and formed in gravelly colluvium or colluvium and the underlying residuum on steep hillsides (Dellrose soils). Rock outcrops are common on uplands.

BIOLOGICAL RESOURCES:

This area supports mixed oak forest vegetation. White oak, black oak, northern red oak, and some scarlet oak are the dominant tree species. Shagbark hickory, bitternut hickory, pignut hickory, and mockernut hickory also occur. Oak, blackgum, flowering dogwood, sassafras, Virginia pine, pitch pine, and shortleaf pine grow mostly on ridgetops.

(Excerpt from 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.)

Classification relationships

Scientific Name: South-Central Interior Large Floodplain
Unique Identifier: CES202.705

Scientific Name: South-Central Interior Small Stream and Riparian
Unique Identifier: CES202.706

Ecological site concept

The communities described in this provisional document reflect plant communities that are likely to be found on these soils. This PES describes hypotheses based on available data of many different scales and sources and has not been developed utilizing site-specific ecological field monitoring. This PES does not encompass the entire complexity or diversity possible on these sites. Field studies would be required for detailed conservation planning or to develop a comprehensive and science-based restoration plan for these sites.

Only two tree species can be selected for entry into the database as dominants; however, multiple tree species may be dominant on these sites and it will vary depending on available seed sources, management, and disturbance history (logging, grazing, etc.). Most of these sites within MLRA 122 are now being utilized for agricultural purposes.

State 1. (Reference): Provisional Ecological Site (PES)

State 1, Phase 1.1: Plant species dominants:

Oaks (*Quercus* spp.) – sweetgum (*Liriodendron tulipifera*) / American hornbeam (*Carpinus caroliniana*) - paw paw (*Asimina triloba*) / small spike false nettle (*Boehmeria cylindrica*) - giant cane (*Arundinaria gigantea*)

Oaks found on these sites as listed in NASIS included pin oak, cherrybark oak, willow oak, swamp white oak, overcup oak, and Shumard oak. Other canopy species recorded in NASIS on these mapunits include sweetgum, tuliptree, eastern cottonwood, and green ash.

State: 2, Phase 2.1: Managed Pasture. Plant species dominants: *Schedonorus arundinaceus* (tall fescue). Species depend on seeding, weed control, concurrent land uses, on-going levels of disturbance, and landowner goals.

State 3, Phase 3.1: Transitional (Abandoned) Field

Plant species dominants: maples (*Acer* spp.) – tulip poplar (*Liriodendron tulipifera*) / multiflora rose (*Rosa multiflora*) - berries (*Rubus* spp.) / *Schedonorus arundinaceus* (tall fescue). Tree species regeneration on these sites will depend on the severity and duration of disturbance, seed sources, and presence or absence of continued site disturbances.

State 4, Phase 4.1: Abandoned cropland

Plant species dominants: 4.1 henbit deadnettle (*Lamium amplexicaule*) – mouse-eared chickweed (*Cerastium* L.).

State: 5, Phase 5.1: Cropland

Plants on these sites will be dependent upon seeding and management. Most common crops are corn and soybeans.

Table 1. Dominant plant species

Tree	(1) <i>Quercus</i> (2) <i>Liquidambar styraciflua</i>
Shrub	(1) <i>Carpinus caroliniana</i> (2) <i>Asimina triloba</i>
Herbaceous	(1) <i>Boehmeria cylindrica</i> (2) <i>Arundinaria gigantea</i>

Physiographic features

These soils are in floodplains.

Table 2. Representative physiographic features

Landforms	(1) Flood plain
Flooding duration	Very brief (4 to 48 hours) to brief (2 to 7 days)

Flooding frequency	Rare to frequent
Ponding frequency	None
Elevation	94–274 m
Slope	0–2%
Water table depth	30–122 cm

Climatic features

Climate

The average annual precipitation in this area is 43 to 63 inches (1,090 to 1,600 millimeters), increasing to the south. The maximum precipitation occurs in winter and early in spring, and the minimum occurs in fall. Most of the rainfall occurs as high-intensity, convective thunderstorms. Snowfall may occur in winter. The average annual temperature is 52 to 60 degrees F (11 to 16 degrees C), increasing to the south. The freeze-free period averages 210 days and ranges from 185 to 235 days. The longer freeze-free periods occur in the more southerly parts of the area.

(Excerpt from 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.)

Table 3. Representative climatic features

Frost-free period (average)	180 days
Freeze-free period (average)	205 days
Precipitation total (average)	1,422 mm

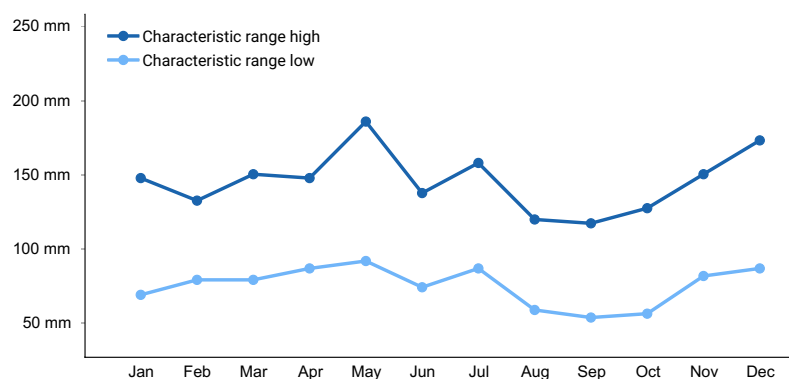


Figure 1. Monthly precipitation range

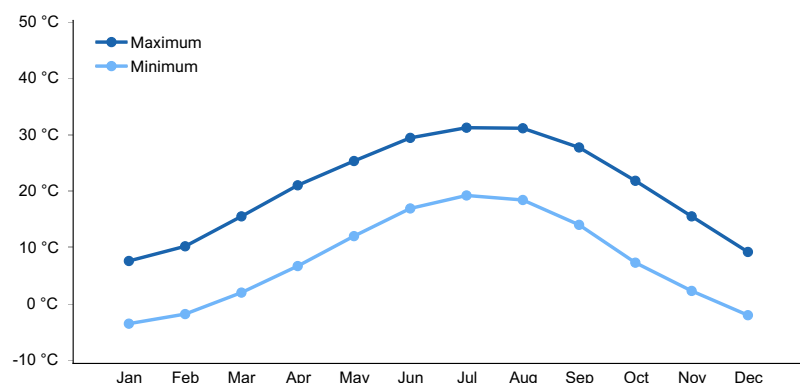


Figure 2. Monthly average minimum and maximum temperature

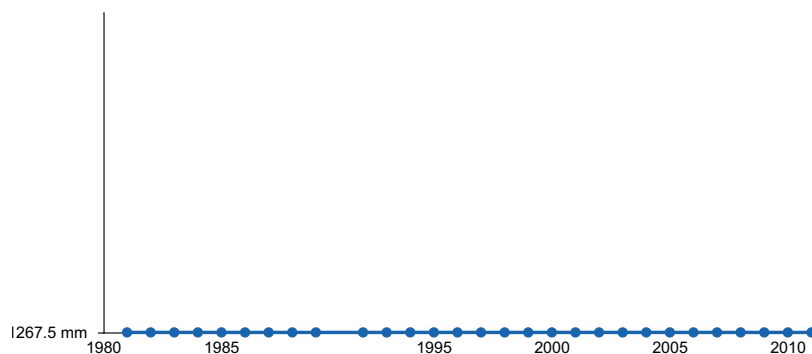


Figure 3. Annual precipitation pattern

Climate stations used

- (1) ELIZABETHTOWN WP CS [USC00152512], Elizabethtown, KY
- (2) COOKEVILLE [USC00402009], Cookeville, TN
- (3) WAYNESBORO [USC00409502], Waynesboro, TN
- (4) CLARKSVILLE WWTP [USC00401790], Clarksville, TN

Influencing water features

These sites have rare to frequent flooding.

Soil features

These soils are in floodplains and are moderately well drained to somewhat poorly drained. They have high levels of available water.

Table 4. Representative soil features

Surface texture	(1) Very gravelly silt loam
Family particle size	(1) Loamy
Drainage class	Somewhat poorly drained to moderately well drained
Soil depth	203 cm
Surface fragment cover <=3"	0–2%
Surface fragment cover >3"	0%
Available water capacity (0-101.6cm)	22.86–30.48 cm
Calcium carbonate equivalent (0-101.6cm)	0–5%
Electrical conductivity (0-101.6cm)	0 mmhos/cm
Sodium adsorption ratio (0-101.6cm)	0
Soil reaction (1:1 water) (0-101.6cm)	5.5–8
Subsurface fragment volume <=3" (Depth not specified)	0–14%
Subsurface fragment volume >3" (Depth not specified)	0–3%

Ecological dynamics

F122XY017KY – Moist Alluvium
MLRA 122

Individual sites deserve a detailed understanding before conservation and restoration practices are implemented; therefore, it should be noted that the communities described in this provisional document reflect plant communities that are likely to be found on these soils and have not been field verified. Therefore, this PES describes hypotheses based on available data of many different scales and sources and has not been developed utilizing site-specific ecological field monitoring. This PES also does not encompass the entire complexity or diversity of these sites. Field studies would be required to develop a comprehensive and science-based native plant restoration plan for these sites.

Forest Vegetation as listed in Official Soil Series Description:

Rahm: Native vegetation is mixed hardwood forest.

Wakeland: Native vegetation is mixed hardwood forest.

Wilbur: The native vegetation is deciduous forest, chiefly of beech, elm, hickory, hackberry, buckeye, sugar maple, oak, and sycamore.

Newark: Native vegetation was bottomland hardwoods, mostly water-tolerant oaks, maples, elms, sycamore, poplar, willow, shagbark hickory, green ash, reeds, and rushes.

ECOLOGICAL DYNAMICS

Only two tree species can be selected for entry into the database as dominants; however, multiple tree species may be dominant on these sites and it will vary depending on available seed sources, management, and disturbance history (logging, grazing, etc.). Most of these sites within MLRA 122 are now being utilized for agricultural purposes.

State 1. (Reference): Provisional Ecological Site (PES)

State 1, Phase 1.1: Plant species dominants:

Oaks (*Quercus* spp.) – sweetgum (*Liriodendron tulipifera*) / American hornbeam (*Carpinus caroliniana*) - paw paw (*Asimina triloba*) / small spike false nettle (*Boehmeria cylindrica*) - giant cane (*Arundinaria gigantea*)

Oaks found on these sites as listed in NASIS included pin oak, cherrybark oak, willow oak, swamp white oak, overcup oak, and Shumard oak. Other canopy species recorded in NASIS on these mapunits include sweetgum, tuliptree, eastern cottonwood, and green ash.

Shrub species will vary by soil moisture and flooding regime and may include silky dogwood, common ninebark, pawpaw, eastern leatherwood, American hornbeam, spicebush, and American bladdernut. The flooding or ponding regime characteristics of individual sites would greatly influence the forest community development, and both canopy, shrub and understory species would depend upon flooding regime and water table height and duration. Future field work may result in these mapunits being split into multiple ESDs.

Facultative Wetland (FACW) understory native plants commonly found in MLRA 122 that may be found on these sites include:

Apois americana (groundnut)

Arisaema dracontium (green dragon)

Arundinaria gigantea (giant cane)

Arisaema triphyllum (Jack in the pulpit)

Bidens aristosa (bearded beggar ticks)

Bidens frondosa (devils' beggartick)

Bidens tripartita (threelobe beggartick)

Boehmeria cylindrica (smallspike false nettle)

Cardamine douglassii (purple cress)

Carex spp. (multiple sedge species)

Chaerophyllum tainturieri (hairy chervil)

Cornus amomum (silky dogwood)

Pilea pumila (Canadian clearweed)

Polygonum pensylvanicum (Pennsylvania smartweed)

Onoclea sensibilis (sensitive fern)
Panicum dichotomiflorum (fall panic grass)
Lobelia siphilitica (great blue lobelia)
Ranunculus abortivus (littleleaf buttercup)
Onoclea sensibilis (sensitive fern)
Mertensia virginica (Virginia bluebells)
Poa sylvestris (woodland bluegrass)

Facultative (FAC) understory native plants commonly found in MLRA 122 that may be found on these sites include:

Adiantum pedatum (maidenhair fern)
Amphicarpaea bracteata (American hog peanut)
Anthyrium filix-femina (lady fern)
Bidens vulgate (big devils beggartick)
Carex spp.
Claytonia virginica (springbeauty)
Collinsonia canadensis (richweed)
Cornus spp. (dogwood)
Cryptotaenia canadensis (Canadian honewort)
Cystopteris bulbifera (bulblet bladderfern)
Dichanthelium clandestinum (deertongue)
Hypericum punctatum (spotted St. Johnswort)
Polygonum virginianum (Virginia knotweed)
Ranunculus recurvatus (blisterwort)
Staphylea trifolia L. (American bladdernut)
Uvularia spp. (bellwort)
Verbena urticifolia (white vervain)
Viola spp (multiple species of violets)

Although native plants likely to be found on reference sites are listed above, the majority of these mapunits within MLRA 122 have been cleared and are currently in agricultural production with cropland, pasture, and hay production being the most common uses. Hydrology has often been modified through tiling or ditching. The few areas remaining in trees are often successional with a site history of logging and grazing.

State: 2, Phase 2.1: Pasture

Managed Pasture. Plant species dominants: *Schedonorus arundinaceus* (tall fescue)

Pasture plant species are dependent on seeding, weed control, concurrent land uses, on-going levels of disturbance, and landowner goals. Individual site and soil characteristics, along with management activities, will influence production levels.

Many species of grass, both warm and cool season, are available and suitable for these sites. Common forage species include tall fescue, orchard grass, Kentucky bluegrass, Johnson grass, timothy, and various species of clover.

Management of pasture sites should follow conservation planning standards and protocols which include watershed protection, soil health, and adequate forage species.

Transitioning this state to a reference condition would require long-term timber stand improvement practices to control non-native vegetation and manage for desired hardwood species.

State 3, Phase 3.1: Transitional (Abandoned) Field

Plant species dominants: maples (*Acer* spp.) – tulip poplar (*Liriodendron tulipifera*) / multiflora rose (*Rosa multiflora*) - berries (*Rubus* spp.) / *Schedonorus arundinaceus* (tall fescue)

Tree species regeneration on these sites will depend on the severity and duration of disturbance, soil characteristics, adjacent plant communities, seed sources, post-disturbance management inputs, and presence or

absence of continued site disturbances. Pioneer tree species that are common in MLRA 122 include *Fraxinus pennsylvanica* (green ash), *Ulmus americana* (American elm), *Celtis laevigata* (sugarberry), boxelder (*Acer negundo*), *Thuja occidentalis* (eastern red cedar), *Acer rubrum* (red maple), and *Populus deltoides* (eastern cottonwood).

Restoration to the reference site (State 1) would require substantial and long-term inputs including planting, timber stand improvement practices, possible hydrology restoration, and weed control.

State 4, Phase 4.1: Abandoned cropland

Plant species dominants: 4.1 henbit deadnettle (*Lamium amplexicaule*) – mouse-eared chickweed (*Cerastium* L.)

Abandonment of cropland would result in many weed species taking over the site. Initially, annual weeds would be predominate followed by grasses, shrubs and finally, pioneers trees.

It would require years of management, plantings, and weed control to establish successional communities that could transition to a reference community. Restoration of hydrology would be necessary if the site was tiled or ditched.

State: 5, Phase 5.1: Cropland

Plant species dominants: *Zea* spp. – *Glycine* spp.

Plants on these sites will be dependent upon seeding and management. Most common crops are corn and soybeans. Due to the drainage issues on these soil, many have been tiled extensively to facilitate crop production.

This state can be transitioned to any of the other states with sufficient management inputs: forest restoration and timber stand management, pasture plantings, hydrology restoration, long-term weed control, etc. Transitioning this state to a reference condition will require extensive timber stand improvement practices to control non-native vegetation and manage for desired species.

TO VALIDATE THE INFORMATION IN THIS PROVISIONAL ECOLOGICAL SITE DESCRIPTION FUTURE FIELD WORK IS NEEDED. This will include detail field inspections and monitoring and multi-site data collection including medium to high intensity vegetation sampling, soil correlations, and an in-depth analysis of gathered data. A final field review, peer review, quality control, and quality assurance reviews of the ESD will be needed to produce a document to be utilized for accurate on-site conservation planning

State and transition model

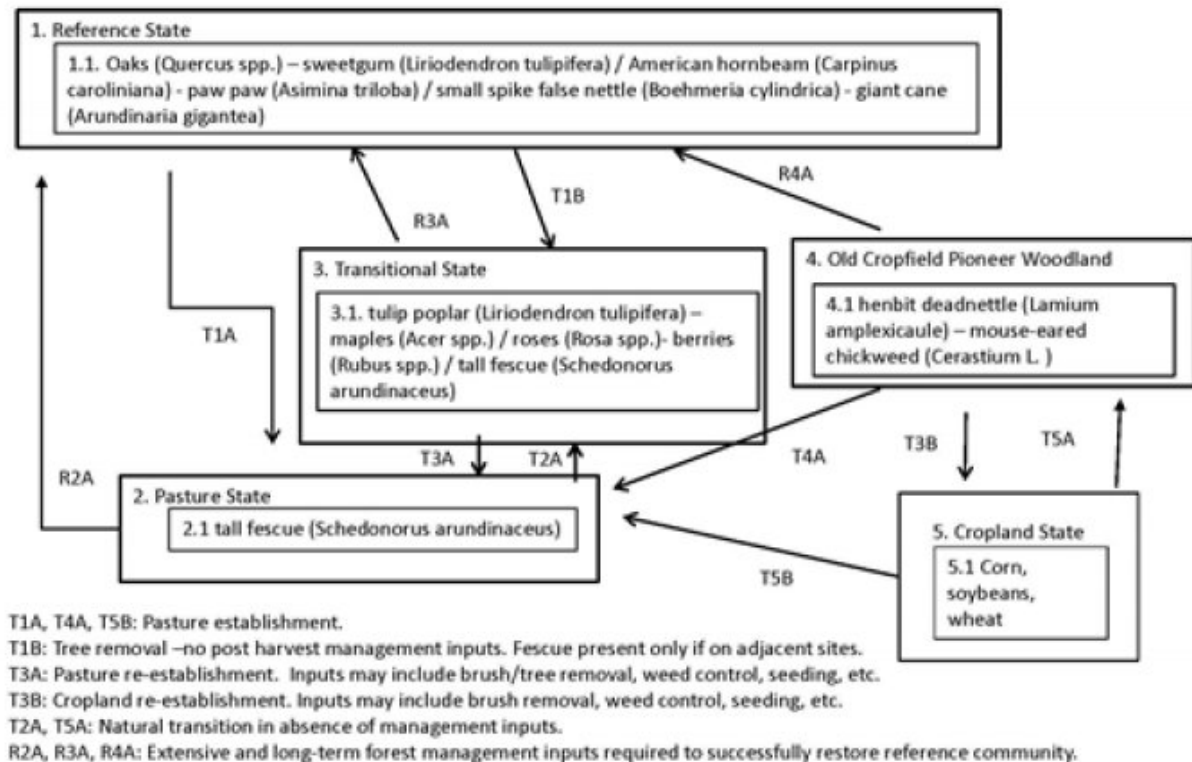


Figure 5. Group17

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:**
