

## **Ecological site F122XY032TN Sandy 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): 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**

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

NatureServe 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. Field studies would be required for detailed conservation planning or to develop a comprehensive and science-based restoration plan for these sites.

Future field work may determine that this grouping be modified or split into multiple ESDs. Soil series may be added or removed pending field verification.

Only two tree species can be selected for entry into the ESIS/EDIT database as dominants; however, multiple tree species may be co-dominant on these sites.

State 1, Phase 1.1: Forestland.

Plant species dominant:

*Quercus* spp. (oaks)- *Populus deltoides* (eastern cottonwood) / *Salix nigra* (black willow) / sedges (*Carex* spp.)

State 2, Phase 2.1: Pastureland.

Plant species dominant:

*Schedonorus arundinaceus* (tall fescue).

Species present are dependent upon management.

State: 3. Phase 3.1: Transitional (Abandoned Field)

Plant species dominant: maples (*Acer* spp.) – American cottonwood (*Populus deltoides*) / berries (*Rubus* spp.) /

*Schedonorus arundinaceus* (tall fescue)

Species will depend on seed sources, level of management, and ongoing disturbance levels.

State 4, Phase 4.1: Abandoned Cropland

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

Composition and successional species will vary according to seed sources, disturbances, and management efforts.

State 5, Phase 5.1: Cropland.

Plant species dominants: dependent upon seeding and management.

Most common crops are corn and soybeans.

Restoration of states 2-5 to the reference community would require long-term, intensive management inputs. Hydrological restoration may be required

**Table 1. Dominant plant species**

Tree	(1) <i>Quercus</i> (2) <i>Populus deltoides</i>
Shrub	(1) <i>Salix nigra</i>
Herbaceous	(1) <i>Carex</i>

## Physiographic features

These sites are located in floodplains.

**Table 2. Representative physiographic features**

Landforms	(1) Flood plain
Flooding duration	Extremely brief (0.1 to 4 hours) to brief (2 to 7 days)
Flooding frequency	Occasional to frequent
Ponding frequency	None
Elevation	34–169 m
Slope	0–5%

Ponding depth	0 cm
Water table depth	152 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)	185 days
Freeze-free period (average)	206 days
Precipitation total (average)	1,422 mm

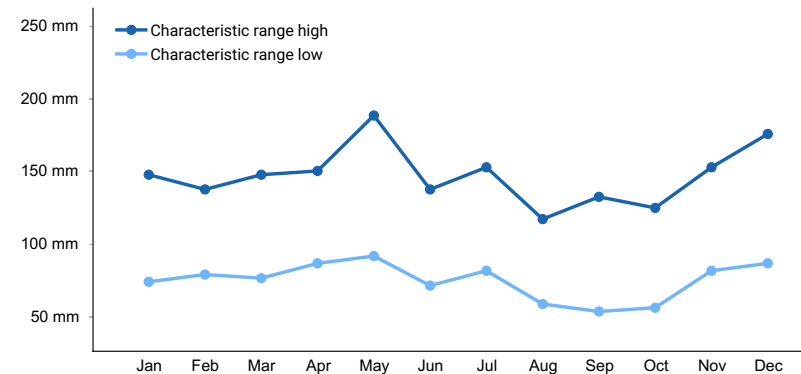


Figure 1. Monthly precipitation range

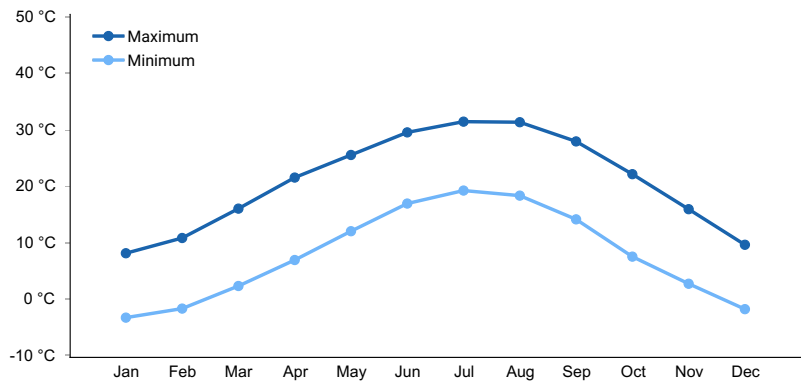
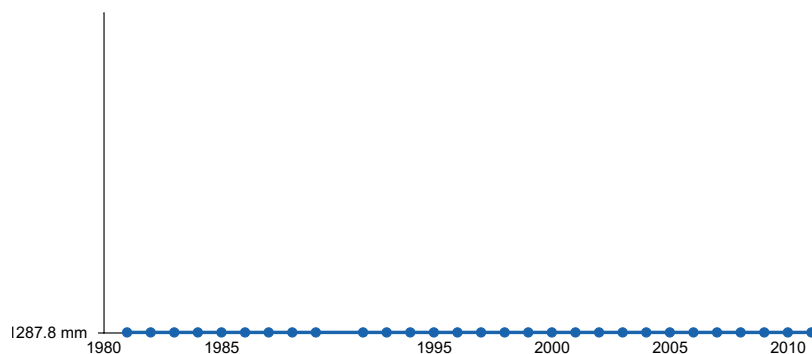


Figure 2. Monthly average minimum and maximum temperature



**Figure 3. Annual precipitation pattern**

## Climate stations used

- (1) SCOTTSVILLE [USC00157215], Scottsville, KY
- (2) CLARKSVILLE WWTP [USC00401790], Clarksville, TN
- (3) COOKEVILLE [USC00402009], Cookeville, TN
- (4) WAYNESBORO [USC00409502], Waynesboro, TN

## Influencing water features

These sites are located within a floodplain and may be influenced by flooding.

## Soil features

These floodplain soils are sandy and excessively drained.

**Table 4. Representative soil features**

Surface texture	(1) Loamy sand (2) Loamy fine sand
Family particle size	(1) Sandy
Drainage class	Excessively drained
Permeability class	Rapid
Soil depth	203 cm
Surface fragment cover <=3"	0%
Surface fragment cover >3"	0%
Available water capacity (0-101.6cm)	7.11–7.87 cm
Calcium carbonate equivalent (0-101.6cm)	0%
Electrical conductivity (0-101.6cm)	0 mmhos/cm
Sodium adsorption ratio (0-101.6cm)	0
Soil reaction (1:1 water) (0-101.6cm)	6.5–6.8
Subsurface fragment volume <=3" (Depth not specified)	0%
Subsurface fragment volume >3" (Depth not specified)	0%

## Ecological dynamics

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MLRA 122

Soil mapunits included in this preliminary grouping include: Bruno, Prader

Future ecological site description (ESD) development may result in mapunits being added or removed from this PES group.

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 extensively field verified. This PES likely 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.

The PES reference community was determined primarily by information found in NASIS and county soil surveys (trees on site, common trees).

NRCS county soil surveys listed trees on site as water tolerant hardwoods, mainly oak, hickory, gum, sycamore, maple, ash, willow, and alder.

NASIS data for these mapunit listed: willow oak, water oak, cherrybark oak, American sycamore, eastern cottonwood, black willow, sweetgum, and pines.

Vegetation as listed in Official Soil Series Description (OSD):

Bruno: Most areas are cleared and used for growing pasture and grain. Natural vegetation is cottonwood, willow, oaks, sycamore, hackberry, and pines.

Prader: No OSD found.

Ecological Dynamics:

State 1, Phase 1.1: Forestland.

Plant species dominant:

*Quercus* spp. (oaks)- *Populus deltoides* (eastern cottonwood) / *Salix nigra* (black willow) / sedges (*Carex* spp.)

State 2, Phase 2.1: Pastureland.

Plant species dominant:

*Schedonorus arundinaceus* (tall fescue).

Species present are dependent upon management. Pasture composition is 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. Common forage species include tall fescue, orchard grass, Kentucky bluegrass, Johnson grass, timothy, and various species of clover. Depending on levels of management, dozens of native forbs and herbs and non-native weed species may be present.

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 dominant: maples (*Acer* spp.) – cottonwood (*Populus deltoides*) / berries (*Rubus* spp.) / *Schedonorus arundinaceus* (tall fescue)

This phase is best described as an old field habitat with a mixture of native and introduced grasses and a variety of

native and non-native herbs, forbs, seedlings, and saplings. Species will depend on seed sources, level of management, and ongoing disturbance levels.

#### State 4, Phase 4.1: Abandoned Cropland

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

Abandonment of cropland would result in many weed species taking colonizing the site. Initially, annual weeds would be predominate followed by perennial weeds, herbs, forbs, grasses, shrubs, and pioneers trees. Composition and successional species will vary according to seed sources, disturbances, and management efforts.

#### State 5, Phase 5.1: Cropland.

Plant species dominants: dependent upon seeding and management.

Most common crops are corn and soybeans.

Restoration of states 2-5 to the reference community would require long-term, intensive management inputs. Hydrological restoration may be required.

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

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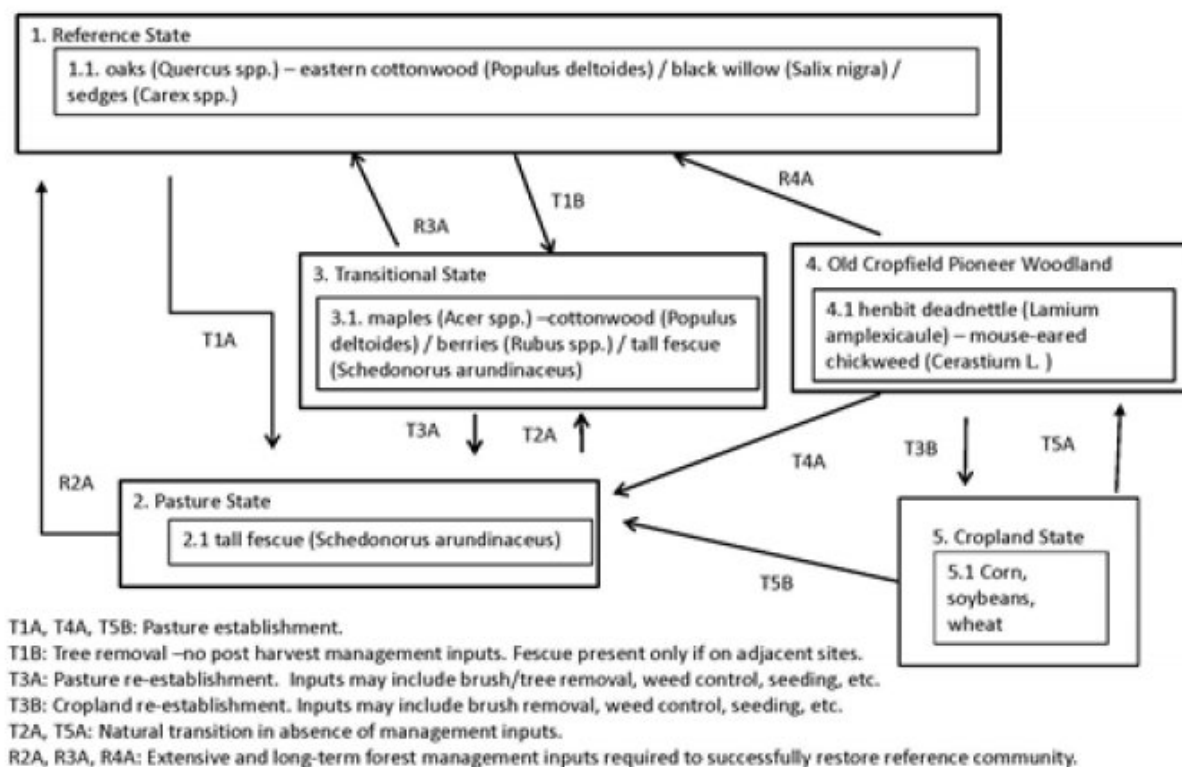


Figure 5. 32-Sandy Alluvium

## 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:**

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6. **Extent of wind scoured, blowouts and/or depositional areas:**

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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):**
- 

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:**
-