USDA Natural Resources Conservation Service

# Ecological site F122XY012KY
# Somewhat Poorly Drained Terrace Lakebeds

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” (Talbott 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, Lynnville, 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). Udults 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

Possible Association(s):
Platanus occidentalis - Liquidambar styraciflua / Carpinus caroliniana - Asimina triloba Forest
Translated Name: American Sycamore - Sweetgum / American Hornbeam - Pawpaw Forest

Common Name: Sycamore - Sweetgum Streambottom Forest
Unique Identifier: CEGL007340
Classification Approach: International Vegetation Classification (IVC)

## Ecological site concept

This PES describes plant communities likely to be found on these soils but does not encompass the entire complexity or diversity potential of these sites. Future field work is required to delineate and develop a full ecological site description (ESD) which can be utilized for conservation and planning purposes.

State 1, Phase 1.1:
pin oak (Quercus palustris) – sweetgum (Liquidambar styraciflua) / spicebush (*Lindera benzoin*) / Canadian woodnettle (*Laportea canadensis*) - lyreleaf sage (*Salvia lyrata*)

Trees found on these sites according to the NASIS database: pin oak, sweetgum, sycamore, tuliptree, green ash, hackberry, “hybrid hickory”, red maple, shellbark hickory, and white ash.

Most of these sites in MLRA 122 are cropland, pasture, urban, or successional woodlands; therefore, the exact characteristics of a true historic reference community is difficult to accurately define. Field studies would be required to develop a restoration plan for conservation purposes.

State: 2. Pasture
State 2, Phase 2.1: Managed Pasture. Plant species dominants: usually *Schedonorus arundinaceus* (tall fescue). Pasture vegetation depends on seeding and management.

State: 3 – Transitional (Abandoned) Field
State 3, Phases 3.1: tulip poplar (*Liriodendron tulipifera*) – maples (Acer spp.) / roses (Rosa spp.)- berries (Rubus spp.) / tall fescue (*Schedonorus arundinaceus*)

Tree species regeneration on these sites will depend on the severity and duration of disturbance, soil characteristics, adjacent plant communities and seed sources, post-disturbance management inputs, presence or absence of continued site disturbances (grazing), slope, and aspect.

State 4: Phase 4.1. Abandoned Cropland
Common plant species dominant:
henbit deadnettle (*Lamium amplexicaule*) – mouse-eared chickweed (Cerastium L. )

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.

Transitioning to a reference condition will require extensive timber stand improvement practices, hydrological restoration, and weed control.

**Table 1. Dominant plant species**

| | |
|---|---|
| Tree | (1) *Quercus velutina*<br>(2) *Carya* |
| Shrub | (1) *Lindera benzoin* |
| Herbaceous | (1) *Laportea canadensis*<br>(2) *Salvia lyrata* |

## Physiographic features

There sites are terrace lakebeds.

**Table 2. Representative physiographic features**

| | |
|---|---|
| Landforms | (1) Terrace<br>(2) Lakebed |
| Flooding duration | Extremely brief (0.1 to 4 hours) to brief (2 to 7 days) |
| Flooding frequency | None to rare |
| Ponding frequency | None |
| Elevation | 91–305 m |
| Slope | 0–4% |
| Water table depth | 30–61 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) | 175 days |
| Freeze-free period (average) | 197 days |
| Precipitation total (average) | 1,372 mm |

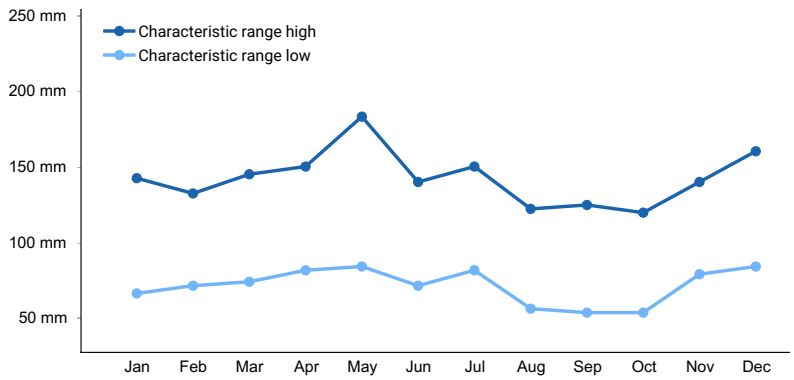


**Figure 1. Monthly precipitation range**

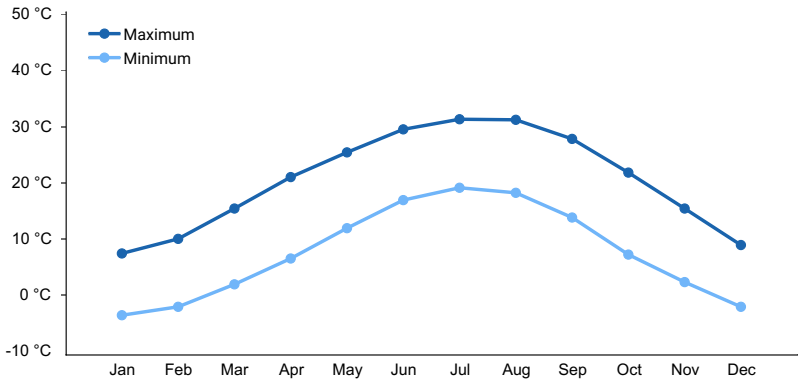


**Figure 2. Monthly average minimum and maximum temperature**

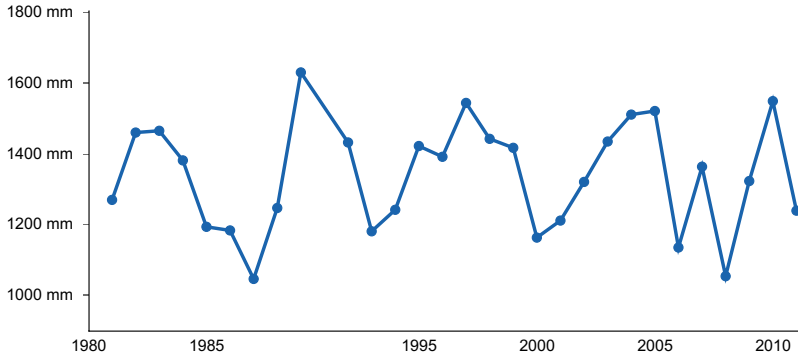


**Figure 3. Annual precipitation pattern**

## Climate stations used

- (1) CLARKSVILLE WWTP [USC00401790], Clarksville, TN
- (2) GREENSBURG [USC00153430], Greensburg, KY
- (3) COOKEVILLE [USC00402009], Cookeville, TN
- (4) SALEM [USC00127755], Salem, IN
- (5) WAYNESBORO [USC00409502], Waynesboro, TN

## Influencing water features

## Soil features

These soils are somewhat poorly drained and located predominately on terraces.

**Table 4. Representative soil features**

| | |
|---|---|
| Parent material | (1) Lacustrine deposits–limestone<br>(2) Alluvium–sandstone |
| Surface texture | (1) Silt loam<br>(2) Sandy clay loam |
| Family particle size | (1) Loamy |
| Drainage class | Somewhat poorly drained |
| Permeability class | Very slow to moderate |
| Soil depth | 152–203 cm |
| Surface fragment cover <=3" | 0% |
| Surface fragment cover >3" | 0% |
| Available water capacity (0-101.6cm) | 15.24–22.86 cm |

| | |
|---|---|
| Calcium carbonate equivalent (0-101.6cm) | 0–15% |
| Electrical conductivity (0-101.6cm) | 0 mmhos/cm |
| Sodium adsorption ratio (0-101.6cm) | 0 |
| Soil reaction (1:1 water) (0-101.6cm) | 5–8 |
| Subsurface fragment volume <=3" (Depth not specified) | 0–3% |
| Subsurface fragment volume >3" (Depth not specified) | 0% |

## Ecological dynamics

F122XY012KY - Somewhat Poorly Drained Terrace Lakebed
Major Land Resource Area (MLRA) 122

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 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 of these sites. Additional field studies are needed for detailed conservation planning or to develop a science-based restoration plan for these soils. Soil series and/or mapunits may be removed or added pending field inspections.

Forest Vegetation as listed in Official Series Descriptions (OSD):
McGary: Native vegetation is mixed hardwood forest.
Tyler: Native vegetation is mixed deciduous hardwood forest.
Morehead: Forested areas are in sycamore, bottom-land post oak, yellow-poplar, sweetgum, river birch, alder, and sedges.

Trees found on these sites based on the NASIS database (field observations recorded while soil mapping is conducted) include black oak, white oak, sweetgum, “hybrid hickories”, shellbark hickory, tuliptree, green ash, sycamore, sugar maple, hackberry, red maple, pines, and white ash.

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 aspect, soil depth, seed sources, management, and disturbance history.

State 1. Forestland.
Phase 1.1: black oak (*Quercus nigra*) – hickories (Carya spp.) / spicebush (*Lindera benzoin*) / Canadian woodnettle (*Laportea canadensis*) - lyreleaf sage (*Salvia lyrata*)

These locations are characterized by somewhat poorly drained soils. Most of these sites in MLRA 122 are cropland, pasture, urban, or successional woodlands; therefore, the exact characteristics of a true historic reference community is difficult to accurately define. Field studies would be required to develop a restoration plan for conservation purposes.

State: 2. Pasture.
Phase 2.1: 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: Transitional (Abandoned) Field
Phases 3.1: tulip poplar (*Liriodendron tulipifera*) – maples (Acer spp.) / roses (Rosa spp.)- berries (Rubus spp.) / tall fescue (*Schedonorus arundinaceus*)

Tree species regeneration on these sites will depend on the severity and duration of disturbance, soil characteristics, adjacent plant communities and seed sources, post-disturbance management inputs, presence or absence of continued site disturbances (grazing), slope, and aspect. Silver maple and sycamore seedlings are common on many moist sites.

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 4: Abandoned Croplands
Phase 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.

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.

Transitioning this state to a reference condition will require extensive timber stand improvement practices to control non-native vegetation and manage for desired species.

## State and transition model

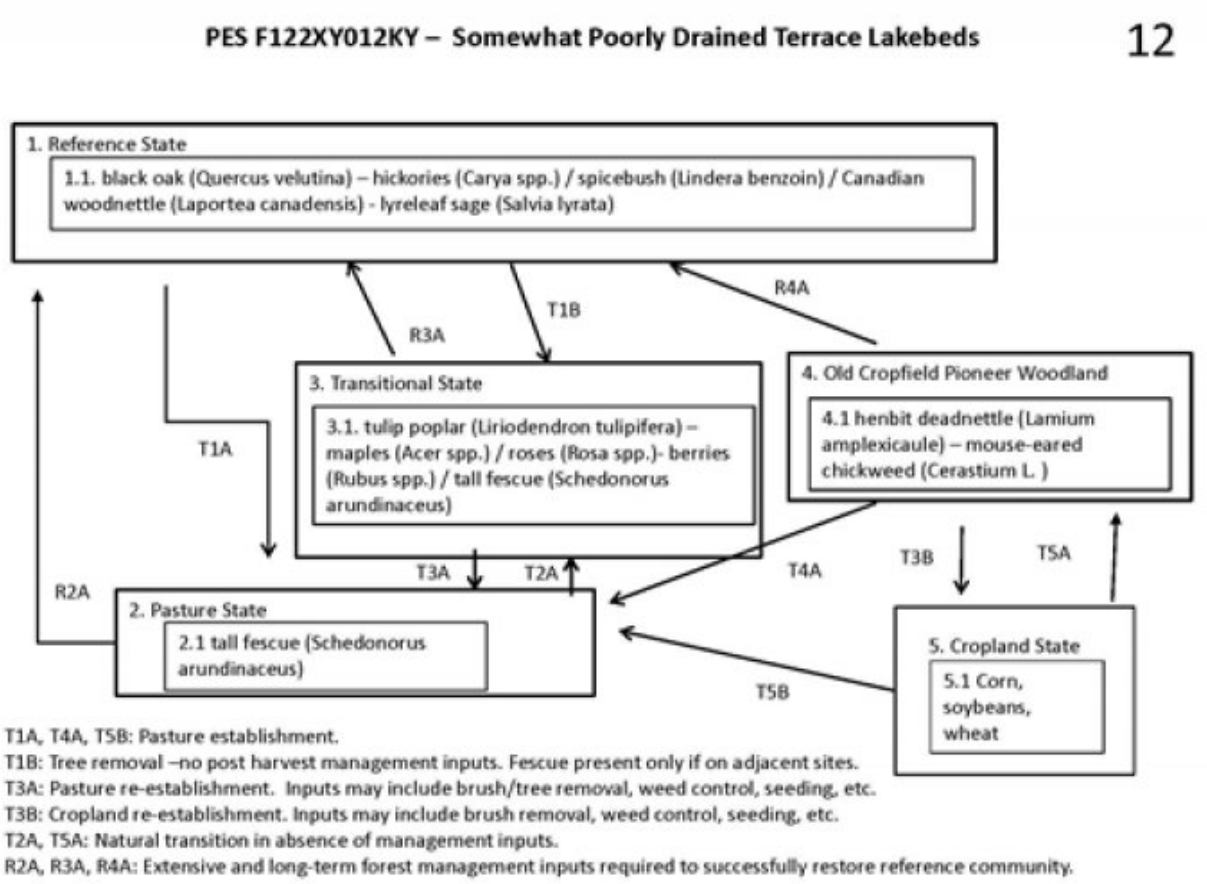


**Figure 5. Group 12**

## 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:**

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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):**

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:**