

## **Ecological site F122XY013KY Saturated Flats**

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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**

South-central Interior Large floodplain/  
South-Central Interior Small Stream and Riparian

Possible NatureServe Associations:

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)

Quercus palustris - Quercus bicolor - (Liquidambar styraciflua) Mixed Hardwood Forest  
Translated Name: Pin Oak - Swamp White Oak - (Sweetgum) Mixed Hardwood Forest  
Common Name: Pin Oak Mixed Hardwood Depression Forest  
Unique Identifier: CEGl002432  
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.

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, Phase 1.1: Forestland.

Plant species dominant:

pin oak (*Quercus palustris*) – sweetgum (*Liquidambar styraciflua*) / paw paw (*Asimina triloba*) – willows (*Salix* spp.) / smallspike false nettle (*Boehmeria cylindrica*) - giant cane (*Arundinaria gigantea*)

State 2, Phase 2.1: Pastureland.

Plant species dominant: *Schedonorus arundinaceus* (tall fescue). Species present are dependent upon modification of hydrology, initial seeding, and any on-going management.

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

Plant species dominant: maple (*Acer* spp.) – green ash (*Fraxinus pennsylvanica*) / willows (*Salix* spp.) / fescue (*Schedonorus arundinaceus*)

State 4: Phase 4.1. Abandoned Croplands

Plant species dominant: 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.

State: 5. Cropland

Phase 5.1: 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 tilled or ditched extensively to facilitate crop production.

Table 1. Dominant plant species

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

## Physiographic features

According to NASIS data, these sites are located on various landforms including closed depressions, depressions, flats, floodplains, lake plains and terraces.

**Table 2. Representative physiographic features**

Landforms	(1) Depression (2) Flat (3) Lake plain
Flooding duration	Extremely brief (0.1 to 4 hours) to brief (2 to 7 days)
Flooding frequency	None to frequent
Ponding duration	Very brief (4 to 48 hours) to brief (2 to 7 days)
Ponding frequency	None to occasional
Elevation	330–800 ft
Slope	0–3%
Water table depth	0–10 in

## Climatic features

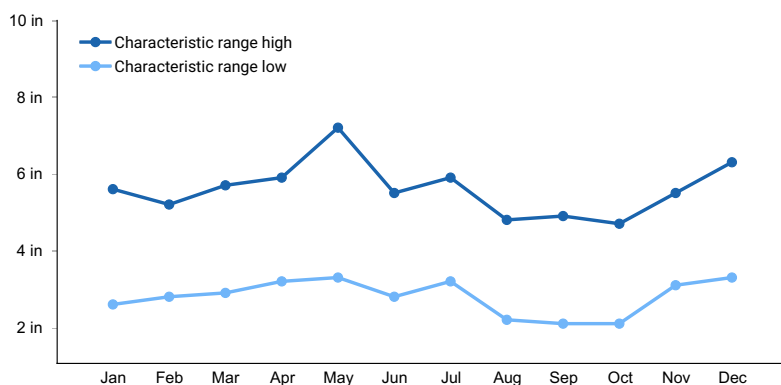
### Climate

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.

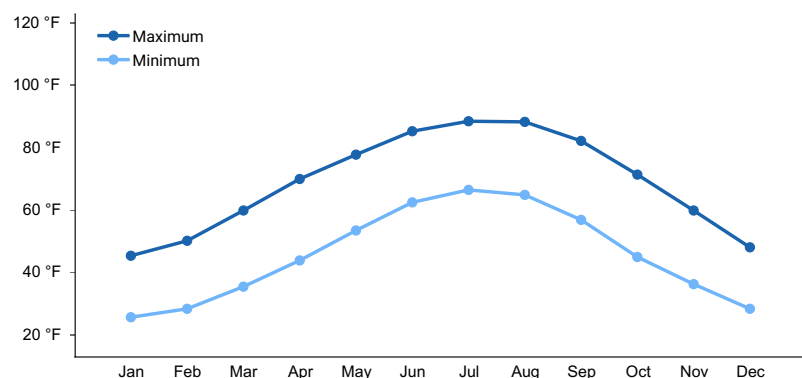
(Excerpt from United States Department of Agriculture, Natural Resources Conservation Service. 2006. Land Resource Regions and Major Land Resource Areas of the United States, the Caribbean, and the Pacific Basin. U.S. Department of Agriculture Handbook 296.)

**Table 3. Representative climatic features**

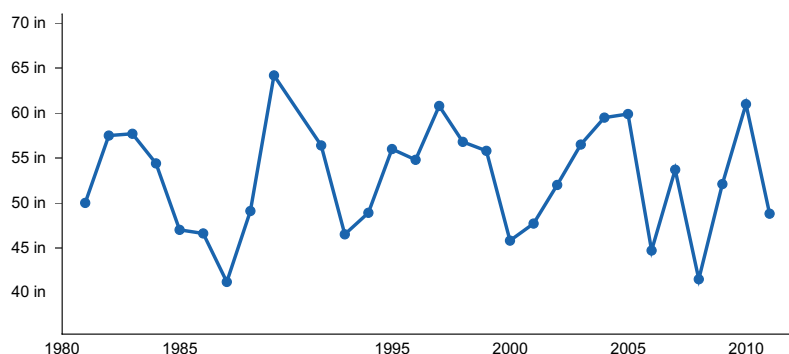
Frost-free period (average)	175 days
Freeze-free period (average)	197 days
Precipitation total (average)	54 in



**Figure 1. Monthly precipitation range**



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



**Figure 3. Annual precipitation pattern**

## Climate stations used

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

## Influencing water features

These sites have a high level of available water (high water table). Mapunits with rare to occasional short-term flooding may be included in this grouping.

## Soil features

These soil are deep to very deep and very poorly to poorly drained.

**Table 4. Representative soil features**

Parent material	(1) Lacustrine deposits–limestone (2) Alluvium–limestone and sandstone (3) Colluvium–limestone and shale
Surface texture	(1) Sandy loam (2) Sandy clay loam
Family particle size	(1) Loamy
Drainage class	Very poorly drained to poorly drained
Permeability class	Very slow to moderate
Soil depth	80 in
Surface fragment cover <=3"	0%

Surface fragment cover >3"	0%
Available water capacity (0-40in)	6–9 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)	5–8
Subsurface fragment volume <=3" (Depth not specified)	0–9%
Subsurface fragment volume >3" (Depth not specified)	0–1%

## Ecological dynamics

### MLRA 122, Saturated Flats, Group 13

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 to develop a comprehensive and science-based native plant restoration plan and for detailed conservation planning purposes. Soil series and/or mapunits may be removed or added pending field inspections.

Forest Vegetation as listed in Official Soil Series Description:

Montgomery soil series: Native vegetation is dominantly herbaceous wetland, mixed with deciduous hardwood trees.

Purdy: Forests are mainly oaks, red maple, beech and hickory

Peoga: Native vegetation is mixed deciduous forest.

Johnsburg: Native vegetation is mixed, deciduous forest.

Robertsville: Native forest is water-tolerant oaks, black willow, sweetgum, cottonwood, American sycamore, green ash, and maple as the major species.

Laconia soil series: Native vegetation was mixed hardwoods of oak, hickory, and maple.

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, Phase 1.1: Forestland.

Plant species dominant:

pin oak (*Quercus palustris*) – sweetgum (*Liquidambar styraciflua*) / paw paw (*Asimina triloba*) – willows (*Salix* spp.) / smallspike false nettle (*Boehmeria cylindrica*) - giant cane (*Arundinaria gigantea*)

State 2, Phase 2.1: Pastureland.

Plant species dominant: *Schedonorus arundinaceus* (tall fescue). Species present are dependent upon modification of hydrology, initial seeding, and any on-going management.

NRCS Soil Surveys are available through USDA-NRCS and provide detailed production estimates, by soil mapunits, for various agricultural practices including pasture.

Pastureland vegetation 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 other species of grass, both warm and cool season, may be seeded on these sites. Common grass species suitable for forage uses 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.

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

Plant species dominant: maple (*Acer* spp.) – green ash (*Fraxinus pennsylvanica*) / willows (*Salix* spp.) / fescue (*Schedonorus arundinaceus*)

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 composition will depend on adjacent and available seed sources and disturbance levels.

State 4: Phase 4.1. Abandoned Croplands

Plant species dominant: 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.

Transitioning States 2, 3, and 4 to a reference condition would require long-term timber stand improvement practices to control non-native vegetation and manage for desired species. Hydrologic restoration would may also be required if the site has been tiled or ditched.

State: 5. Cropland

Phase 5.1: 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 or ditched extensively to facilitate crop production.

Transitioning this state to a reference condition will require extensive, long-term restoration efforts including timber stand improvement practices to control non-native vegetation and manage for desired species. Hydrologic restoration would may also be required if the site has been tiled or ditched.

## State and transition model

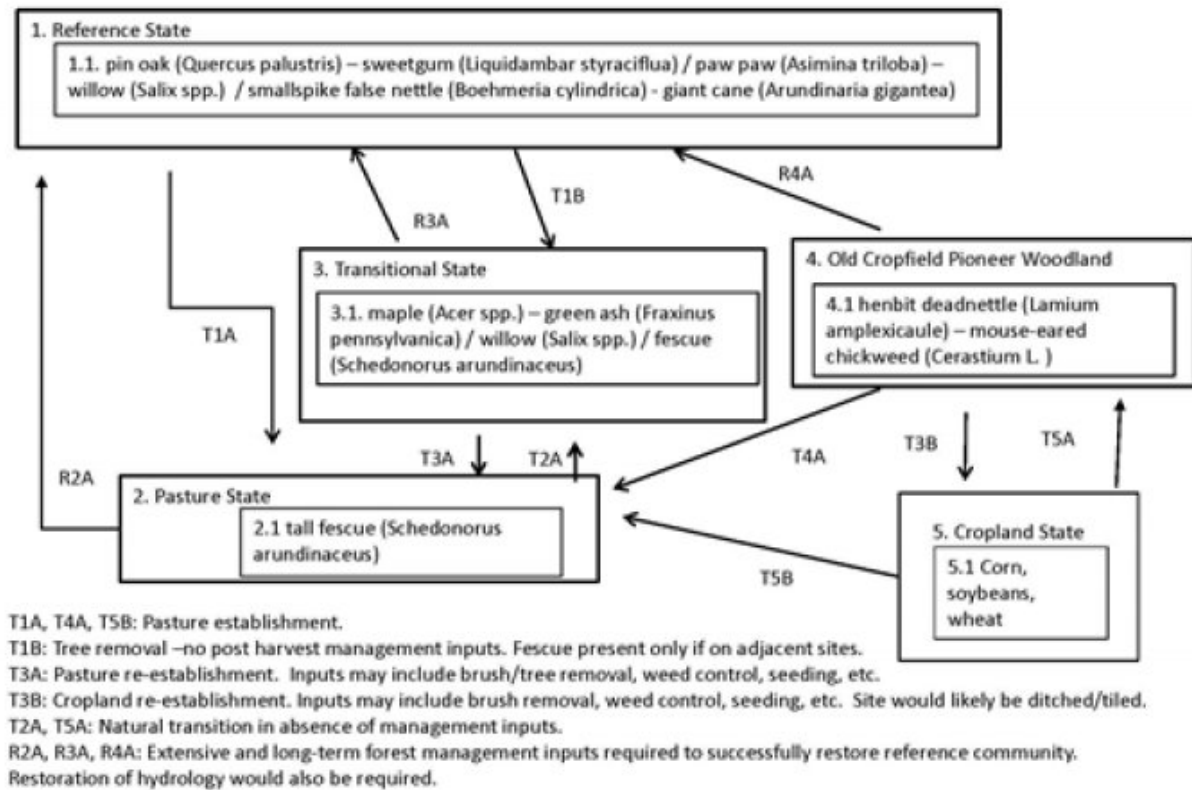


Figure 5. group13

## 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):**



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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:**

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