Ecological site F121XY031KY
Somewhat Poorly Drained Floodplain

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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): 121X–Kentucky Bluegrass

General: MLRA 121 is in Kentucky (83 percent), southern Ohio (11 percent), and southern Indiana (6 percent). It makes up about 10,680 square miles (27,670 square kilometers). The cities of Cincinnati, Ohio, and Louisville, Frankfort, and Lexington, Kentucky, are in this area.

Physiography: This area is primarily in the Lexington Plain Section of the Interior Low Plateaus Province of the Interior Plains.

Soils: The dominant soil orders in MLRA 121 are Alfisols, Inceptisols, and Mollisols. The soils in the area dominantly have a mesic soil temperature regime, an udic soil moisture regime, and mixed mineralogy. They are shallow to very deep, generally well-drained, and loamy or clayey. Hapludalfs formed in residuum on hills and ridges (Beasley, Cynthiana, Eden, Faywood, Lowell, and McAfee series) and in loess over residuum on hills and ridges (Carmel and Shelbyville series). Paleudalfs (Crider and Maury series) formed in loess or other silty sediments over residuum on hills and ridges. Fragiudalfs (Nicholson series) formed in loess over residuum on ridges. Hapludolls formed in residuum on hills and ridges (Fairmount series) and in alluvium on floodplains (Huntington series). Eutrudepts (Nolin series) formed in alluvium on flood plains.

Geology: Most of this area has an Ordovician-age limestone that has been brought to the surface in the Jessamine Dome, a high part of a much larger structure called the Cincinnati Arch. The strata of limestone have a propensity to form caves and karst topography. Younger units of thin-bedded shale, siltstone, and limestone occur at the eastern and western edges of the area.
The area has no coal-bearing units. Pleistocene-age loess deposits cover most of the bedrock units in this MLRA, and some glacial lake sediments are at the surface in the northwest corner of the area. Unconsolidated alluvium is deposited in the river valleys.

Classification relationships

Bottomland hardwood forest (Kentucky State Nature Preserves Commission, 2009)

Ecological site concept

This group includes soils generally found in floodplains and are somewhat poorly drained. The natural vegetation of these sites will vary in relationship to the setting, patterns of drainage, disturbances, and previous vegetation communities. Future field work may result in multiple ESDs from this initial PES grouping due to flooding frequency and/or ponding duration. Most of these sites within MLRA 121 are now drained and being utilized for agricultural purposes.

State 1. (Reference): Provisional Ecological Site (PES)
State 1, Phase 1.1: Plant species dominants:
Quercus palustris - Liquidambar styraciflua /Lindera benzoin /Mertensia virginica-Apois americana
(pin oak-sweetgum/ spicebush /Virginia bluebells-groundnut)

Narrative: Trees found on these sites as listed in the National Soil Information System (NASIS) included pin oak, sweetgum, tuliptree, eastern cottonwood, green ash, white ash, red maple, cherrybark oak, northern red oak, and black oak. Understory species may include dogwood, pawpaw, arrowwood (Viburnum dentatum), and witchhazel (Hamamelis virginiana).

State: 2. Pasture
State 2, Phase 2.1: Managed Pasture. Plant species dominants: Schedonorus arundinaceus (tall fescue)

State: 3 – Transitional (Abandoned) Field
State 3, Phases 3.1: Acer saccharinum-Liriodendron tulipifera/Rosa multiflora- Rubus spp. /Schedonorus arundinaceus (sugar maple - tulip poplar / multiflora rose – blackberry / tall fescue)

State: 4. Old Cropfield Pioneer Woodland
State 4, Phase 4.1: Plant species dominants: Lamium amplexicaule - Cerastium L.
(henbit deadnettle - mouse-eared chickweed)

State: 5. Cropland
State 5, 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 extensively to facilitate crop production.

Restoration of these non-forested states to the reference forest community would require substantial and long-term inputs including planting, timber stand improvement practices, and weed control.

Table 1. Dominant plant species

Tree	(1) *Quercus palustris*
	(2) *Liquidambar styraciflua*
Shrub	(1) *Lindera benzoin*
Herbaceous	(1) *Mertensia virginica*
	(2) *Apios americana*

Physiographic features

Field work is needed to refine this grouping of soil mapunits.

It is anticipated that multiple ESDs may be developed from this group based on ponding frequency and duration.

Table 2. Representative physiographic features

Landforms	(1) Flood plain
Flooding duration	Brief (2 to 7 days) to very long (more than 30 days)
Flooding frequency	Occasional to frequent
Ponding duration	Very long (more than 30 days)
Ponding frequency	None to frequent
Elevation	131–274 m
Slope	0–2%
Water table depth	0–38 cm

Aspect	Aspect is not a significant factor

Climatic features

MLRA climate summary: The average annual precipitation in most of this area is 41 to 45 inches. It is 45 to 52 inches along the southern edge of the area. About one-half of the precipitation falls during the growing season. Most of the rainfall occurs as high-intensity, convective thunderstorms. The annual snowfall averages about 14 inches (370 millimeters). The average annual temperature is 51 to 57 degrees F (10 to 14 degrees C). From: 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, 2006)

Table 3. Representative climatic features

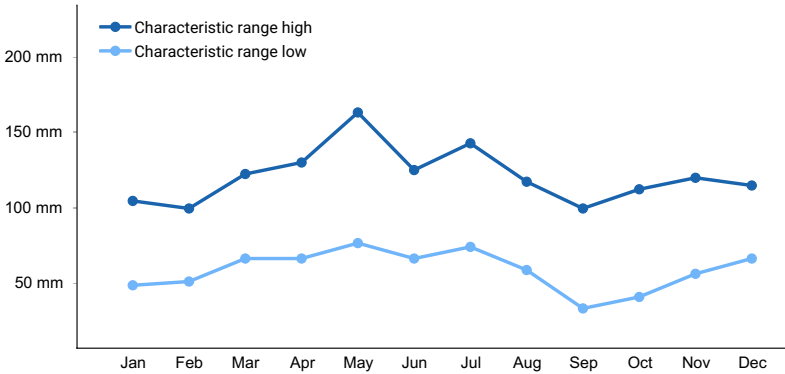| Frost-free period (average)	179 days
Freeze-free period (average)	201 days
Precipitation total (average)	1,168 mm

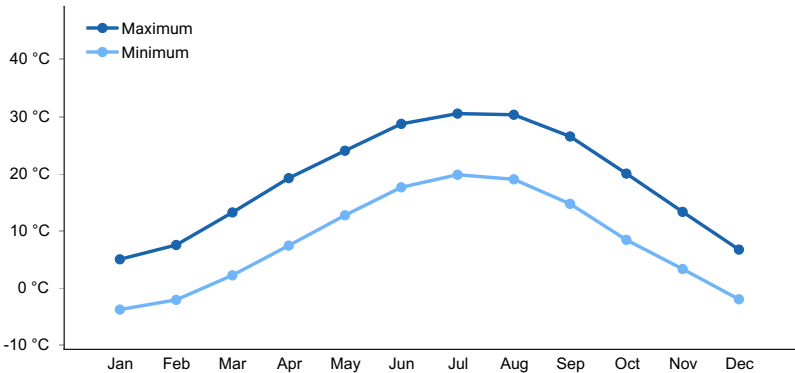**Figure 1. Monthly precipitation range**

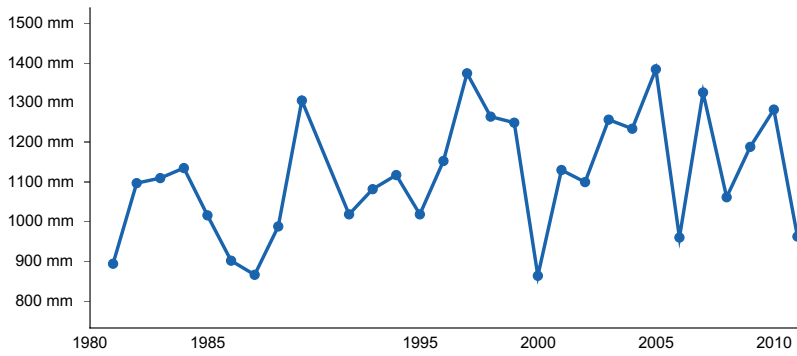**Figure 2. Monthly average minimum and maximum temperature**

Figure 3. Annual precipitation pattern

Climate stations used

- (1) LEXINGTON BLUEGRASS AP [USW00093820], Lexington, KY
- (2) CINCINNATI NORTHERN KY AP [USW00093814], Burlington, KY
- (3) LOUISVILLE INTL AP [USW00093821], Louisville, KY

Influencing water features

These sites are adjacent to streams and waterways within MLRA 121.

Soil features

Deep and very deep soils that are SWPD in floodplains.

Table 4. Representative soil features

Surface texture	(1) Silt loam
Family particle size	(1) Loamy
Drainage class	Somewhat poorly drained
Permeability class	Moderate
Soil depth	152 cm
Surface fragment cover <=3"	0%
Surface fragment cover >3"	0%
Available water capacity (0-101.6cm)	18.29–20.57 cm
Calcium carbonate equivalent (0-101.6cm)	0%
Sodium adsorption ratio (0-101.6cm)	0
Soil reaction (1:1 water) (0-101.6cm)	6.5–7
Subsurface fragment volume <=3" (Depth not specified)	0–8%
Subsurface fragment volume >3" (Depth not specified)	0–1%

Ecological dynamics

State and transition model

Contributors

Arends

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:**