USDA Natural Resources Conservation Service

Ecological site F134XY301LA
West Central Flooded Swales And Depressions And Flood Plains - PROVISIONAL

Accessed: 05/03/2024

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): 134X–Southern Mississippi Valley Loess

MLRA 134, Southern Mississippi Valley Loess, is in Mississippi (39 percent), Tennessee (23 percent), Louisiana (15 percent), Arkansas (11 percent), Kentucky (9 percent), Missouri (2 percent), and Illinois (1 percent). It makes up about 26,520 square miles (68,715 square kilometers). The northern part of the area includes Paducah and Murray, Kentucky; Paragould, Jonesboro, and Forrest City, Arkansas; and Memphis, Dyersburg, Bartlett, and Germantown, Tennessee. The southern part includes Yazoo City, Clinton, and Jackson, Mississippi, and Baton Rouge, Opelousas, Lafayette, and New Iberia, Louisiana. This portion is the central western part of the MLRA in Louisiana and Arkansas. It is in the Macon Ridge Section of the EPA Ecoregions in sub-section 73j. The dissected plains in this MLRA have a loess mantle that is thick at the valley wall and thins rapidly as distance from the valley wall increases. This portion of the MLRA is distinct from other portions of the MLRA because of the influences of the Mississippi River and it series of entrenchments and adjacent old channels of the Arkansas River, such channels as Bayou Bartholomew, Bayou Bonnne Idee, Boeuf River, and segments of the Ouachita River. The Macon Ridge has been inhabited prior to European Settlement, Poverty Point is located on the east central portion of the Macon Ridge and has earthworks dating back to 1700-1100 BC.

Classification relationships

Major Land Resource Area (MLRA) and Land Resource Unit (LRU) (USDA-Natural Resources Conservation Service, 2006)
EPA Level IV Ecoregion
The Natural Communities of Louisiana - (Louisiana Natural Heritage Program - Louisiana Department of Wildlife and Fisheries)

Ecological site concept

The site is Nearly Level thin loess, less than 4ft thick, potentially reworked loess by alluvial actions, poorly drained. Found on broad flats, drainage ways and depressional areas adjacent to drainage ways of the Macon Ridge likely overlaying clayey braided stream materials. Chemical properties of the soil are potentially high Na in subsoil. Frequently or Occasionally flooded with Long Duration (7 to < 30 days) typically December through April in Normal years. Sites contained historically bottomland hardwoods, (Nuttall oak, Willow oak, Green ash, Overcup oak, Bitter pecan and Bald cypress, Drummond red maple, Swamp privet, Persimmon, Tupelo gum). Wetness and flooding limitations for Cropland, pasture and other land uses.

Associated sites

F134XY302LA	**West Central Swales/Depressions Wet Flats - PROVISIONAL** The "West Central Swales/Depressions Wet Flats - PROVISIONAL" site is similar but will be found at higher local elevations.

Similar sites

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Table 1. Dominant plant species

Tree	Not specified
Shrub	Not specified
Herbaceous	Not specified

Physiographic features

Macon Ridge in extreme northeastern Louisiana and southeastern Arkansas is a 135-mile long prominent ridge that lies between the Boeuf and Tensas Basins (Saucier, 1994). Macon Ridge is a terrace that features level to gently undulating topography with steep scarps of uplands, floodplains, depressions, and drainageways. The entire area is located within the Mississippi Alluvial Valley section of the Coastal Plain Province of the Atlantic Plain. It reaches a maximum width of about 25 miles in northeastern Louisiana about 30 miles north of Sicily Island (Saucier, 1994). Elevation ranges from 50 to 150 feet (15 to 46 m). The ridge is consistently higher on its eastern side where elevations are 20 to 30 feet higher than in the adjacent Tensas Basin (floodplain). It is bounded on the eastern edge by Bayou Macon. On the western side, bounded by the Boeuf River, elevations of the ridge are approximately the same as those in the Boeuf Basin, and it is sometimes difficult to distinguish the two at the surface (Saucier, 1994). Both Bayou Macon and Boeuf River are underfit streams occupying ancient Arkansas River meanders. The entire Macon Ridge is underlain by Pleistocene-aged loamy and clayey braided stream alluvium from the “old” Arkansas River. Macon Ridge consists almost entirely of Early Wisconsin age glacial outwash and is a continuation of the valley train in the Western Lowlands (Saucier, 1994). The area mantled by loess on the eastern edge of the terrace rises 10 to 30 feet above the floodplains. The loess thins toward the west, and elevation decreases. The loess in the western part of Macon Ridge contains small mixtures of the older underlying braided-stream terrace alluvium, and in even lower elevations, the loess contains mixtures of recent clayey alluvium or is buried completely beneath recent alluvium (T. E. Allen, USDA-NRCS Richland Parish Soil Survey Report, 1993).

This Site occurs on clayey and silty broad flats of floodplains, depressions and narrow drainageways on the loess-mantled Macon Ridge braided stream terrace in both Arkansas and Louisiana. Slopes are level (0 to 1 percent. These sites include floodplains, depressions and drainageways of Caney Bayou, Indian Bayou, Big Colewa Creek, Big Creek and Old Big Creek, Little Creek, Bee Bayou, Bulls Bayou, Muddy Bayou, Turkey Creek, Ash Slough, Daves Bayou, and Deer Creek.

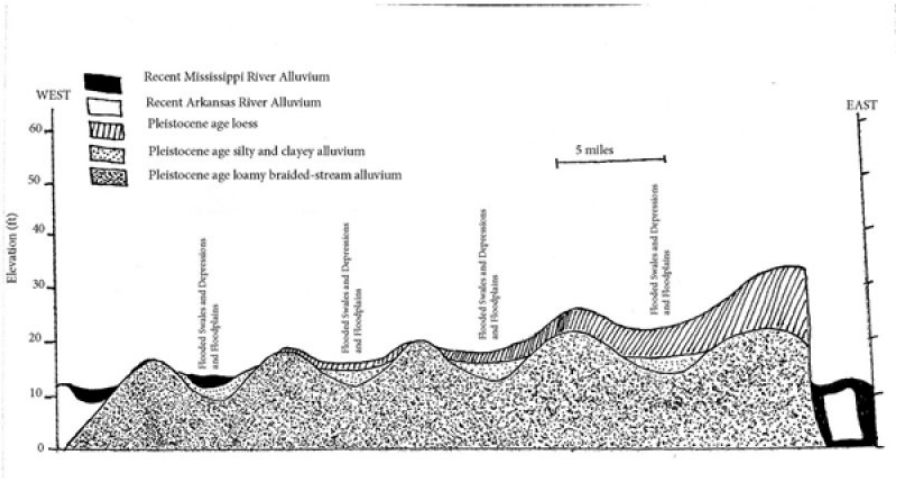

Figure 1. 134XY301 PES Landscape Diagram

Table 2. Representative physiographic features

Landforms	(1) Flood plain (2) Depression (3) Drainageway
Flooding duration	Brief (2 to 7 days) to long (7 to 30 days)
Flooding frequency	Occasional to frequent
Elevation	15–37 m
Slope	0–1%
Water table depth	0–76 cm
Aspect	Aspect is not a significant factor

Climatic features

The climate of North East Louisiana and South East Arkansas is warm and humid with a monthly precipitation that is well distributed throughout the year. The monthly precipitation mean is between 2.9 and 5.3 inches, with the lowest rainfall occurring from June through November. The following climatic data are averages from the three weather stations listed below. Temperature and precipitation may vary considerably from that listed for each month. Site specific weather data should be used for land management decisions. For site specific weather conditions, obtain data from a weather station close to the site.

Table 3. Representative climatic features

Frost-free period (average)	227 days
Freeze-free period (average)	263 days
Precipitation total (average)	1,499 mm

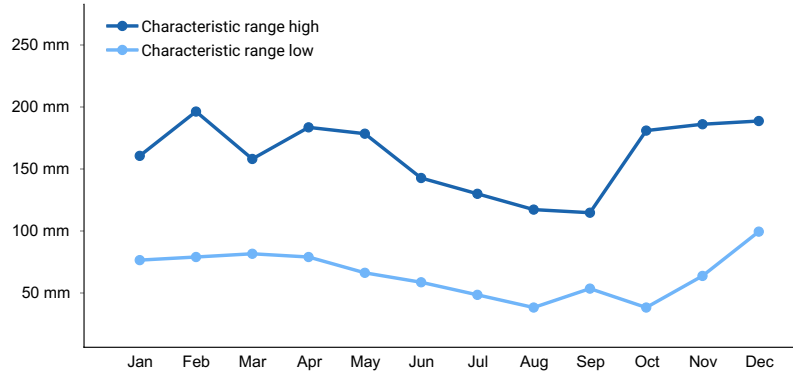

Figure 2. Monthly precipitation range

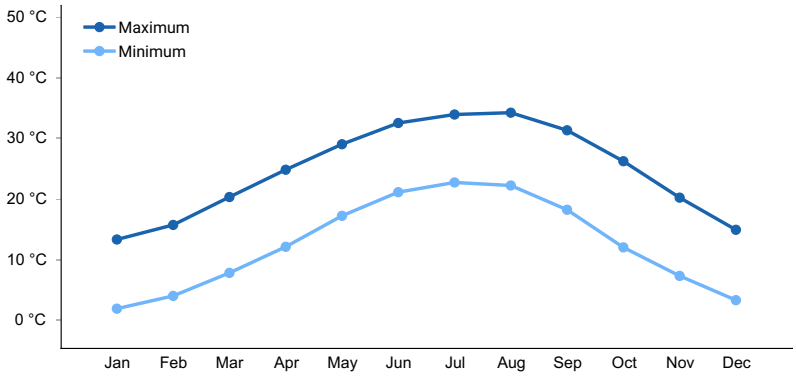

Figure 3. Monthly average minimum and maximum temperature

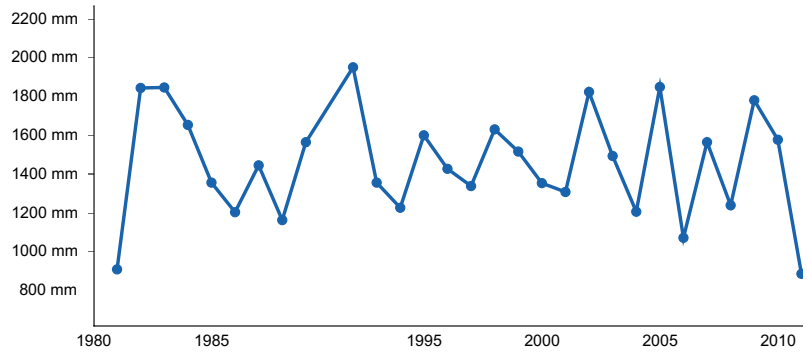

Figure 4. Annual precipitation pattern

Climate stations used

- (1) EUDORA [USC00032355], Eudora, AR
- (2) RAYVILLE [USC00167691], Rayville, LA
- (3) WINNSBORO 5 SSE [USC00169806], Winnsboro, LA

Influencing water features

This site is influenced by both surface and sub-surface hydrology. Several inches of standing water can be found in the winter months and soils may be saturated into early spring. Wetness is a dominate driver of this system and in Alternative States it will be a limiting factor.

Soil features

Forestdale silty clay loam, 0 to 1 percent slopes, occasionally flooded
Gilbert silt loam, occasionally flooded
Waverly silt loam, frequently flooded

Soils are poorly drained, Typic Endoaqualfs (Forestdale), Typic Glossaqualfs (Gilbert) and Fluvaquentic Endoaquepts (Waverly). These soils formed from mixed clayey, loamy, and silty alluvium, and loess sediments of late Pleistocene Age. Slopes range from 0 to 1 percent. These very deep, slowly and very slowly permeable soils are found in broad flats and narrow depressional areas. These soils are considered hydric and the water table is at or within 1.5 feet of the surface during winter and spring months in normal years. These soils are subject to occasional or frequent flooding for brief to long duration.

Table 4. Representative soil features

Surface texture	(1) Silty clay loam (2) Silt loam
Family particle size	(1) Loamy
Drainage class	Poorly drained
Permeability class	Very slow to slow
Soil depth	152–203 cm
Surface fragment cover <=3"	0%
Surface fragment cover >3"	0%
Available water capacity (0-101.6cm)	0.23–0.61 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)	4.5–7.8
Subsurface fragment volume <=3" (Depth not specified)	0%
Subsurface fragment volume >3" (Depth not specified)	0%

Ecological dynamics

The pre settlement plant community of this site would have been dominated by bottomland hardwood species. Within this site there will be a gradient of wetness from Frequent to Occasional flooding and duration from brief to long. These variations in flooding will dictate the species that are present and the composition of them within an area.

Due to wetness, rooting depths of some species will be limited and with these limitations there is a potential for some trees to be uprooted by climatic events, such as strong winds or floods. With these events, openings I the canopy can occur which will set back succession and allow herbaceous and woody shrub species to colonize, these low stature communities are generally short lived and the upper canopy will close as tall growing trees mature. There is generally a age gradient within a forest stand from the herbaceous openings to mature bottomland hardwoods.

This site has been altered by human activity and is utilized for multiple production systems such as Aquaculture, Cropland and Pasture for all of these alternative states wetness is a limitation for this site. Pine Plantings have been made on this site however they are not recommended due to the wetness which limits productivity and management activities.

State and transition model

Ecosystem states

1. Historic Community - Bottomland Hardwoods

2. Cropland

3. Pastureland

4. Aquaculture

State 1 submodel, plant communities

1.1. Bottomland Hardwood

State 2 submodel, plant communities

2.1. Cropland

State 3 submodel, plant communities

3.1. Pasture

State 4 submodel, plant communities

4.1. Aquaculture

State 1
Historic Community - Bottomland Hardwoods

historically bottomland hardwoods, Nuttall oak, Willow oak, Green ash, Overcup oak, Bitter pecan and Bald cypress, Drummond red maple, Swamp privet, Persimmon, Tupelo gum

Community 1.1
Bottomland Hardwood

Nuttall oak, Willow oak, Green ash, Overcup oak, Bitter pecan and Bald cypress, Drummond red maple, Swamp privet, Persimmon, Tupelo gum

State 2
Cropland

Cropland

Community 2.1
Cropland

Row Crop Production

State 3
Pastureland

Managed Pasture - PHG 2D

Community 3.1
Pasture

Managed pasture: It is not practical to apply high rates of fertilizer due to the overflow hazard. All soils need nitrogen fertilization for production when grasses are grown alone. These soils have severe limitations due to the frequency and/or duration of flooding which normally occurs from December through June. Adapted species are limited.

Common Bermuda is the better adapted grass on these soils. On many of these soils it is the only species that can be used.

Table 5. Annual production by plant type

Plant Type	Low (Kg/Hectare)	Representative Value (Kg/Hectare)	High (Kg/Hectare)
Grass/Grasslike	7846	10088	12329
Total	**7846**	**10088**	**12329**

State 4
Aquaculture

This state occurs when a site has been converted to Aquaculture production. Typically this will include ponds for the production of fish.

Community 4.1
Aquaculture

Aquaculture Production

Additional community tables

Table 6. Community 3.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production (Kg/Hectare)	Foliar Cover (%)
Grass/Grasslike					
1	**Warm Season Grasses**			7846–12329	
	Bermudagrass	CYDA	*Cynodon dactylon*	7846–12329	–

Animal community

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Hydrological functions

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Recreational uses

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Wood products

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Other products

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Other information

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Contributors

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The Macon Ridge Technical Team did an outstanding job of utilizing existing data and knowledge to develop site concepts. They also provided the needed sections of the descriptions, review and comments of them.

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:**

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:

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17. **Perennial plant reproductive capability:**
