Ecological site R134XY404LA
Southwestern Loess Ridge Prairie

Last updated: 5/14/2025
Accessed: 09/18/2026

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 site is in the farthest southwest part of the MLRA in Louisiana. It is in the West Gulf Coastal Plain Section of the EPA Ecoregions in sub-section 34j, Lafayette Loess Plains. 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 historically distinct from other portions of the MLRA because of its Vegetative cover was historically dominated by Herbaceous species and is part of what is locally referred to as the Cajun Prairie.

LRU notes

N/A

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) - Coastal Prairie

Ecological site concept

Nearly level to very steep uplands and terraces having slopes ranging from 0 to 45 percent. Formed under herbaceous vegetation in loess deposits 4 to 20 feet thick. Upland dry to mesic prairies found on Sideslopes, Summits and the 2nd Terrace of the Lafayette Loess Plain Portion of the Cajun Prairie. Soils are typically often very dry to droughty in late spring and fall however they can become saturated in winter with adequate rainfall and reduced utilization of water by plants. Historically, trees were confined to the more droughty sideslopes adjacent to this site where the trees are encroaching from the Mississippi River Alluvial Plain. The intrinsic soil conditions and frequent burning from lightning strikes prevented invasion by woody trees and shrubs and maintained the prairie vegetation. Certain woody species may invade without periodic fire. The introduced species Triadica sebifera (equal to Sapium sebiferum; Chinese tallow tree) has become especially problematic, forming dense thickets or forests. Coastal Prairie vegetation is extremely diverse and dominated by grasses.

Associated sites

R134XY402LA	**Southwestern Loess Terrace Prairie** The Loess Terrace Prairie site is generally found adjacent and at a lower position on the landscape.

Similar sites

R150AY014LA	**Loamy Terrace Ridge** The loamy Ridge site is similar to this site in landscape position but is found on the older less productive soils of the Gulf Coast Prairie.
R134XY421LA	**Southwestern Pre-Peoria Loess Prairie** The Pre-Peoria Loess Prairie site is similar, although the soils are from an older depositional age.

Table 1. Dominant plant species

Tree	Not specified
Shrub	Not specified
Herbaceous	Not specified

Physiographic features

This part of the MLRA is in the West Gulf Coastal Plain Section of the Coastal Plain Province of the Atlantic Plain. It is characterized by nearly level to steeply sloping and sharply dissected plains that have a loess mantle that is thick at the valley wall and thins rapidly as distance from the valley wall increases. Valley sides are hilly to steep, especially in the Eastern part of the area closest to the Mississippi river Valley. The intervening ridges generally are narrow and rolling, but some of the interfluves between the upper reaches of the valleys are broad and flat. Stream valleys are narrow in the upper reaches but broaden rapidly downstream and have wide, flat flood plains and meandering stream channels. The rivers and streams that drain this subsection of the MLRA generally flow westerly through the Coastal Prairie prior to reaching the Gulf of America. The loess soils are derived from the floodplain along the Mississippi River.

Table 2. Representative physiographic features

Landforms	(1) Terrace (2) Ridge
Flooding frequency	None to very rare
Ponding frequency	None
Elevation	0 – 80 m
Slope	0 – 20 %
Ponding depth	0 cm
Water table depth	60 – 90 cm
Aspect	Aspect is not a significant factor

Climatic features

Southwest Louisiana has a warm, humid climate, with fairly long summers and relatively short winters. The result is a long growing season and abundant plant growth. Water is a definitive part of the southern Louisiana landscape, largely due to the combination of low elevation and fairly abundant rainfall in most years. Mean annual precipitation ranges from 51 to 67 inches over this region, and is fairly well distributed throughout the year. There have been 5 in 30 years when less than 50 inches of precipitation has fallen and not less than 40 inches. Snow is a rarity, and little more than one inch typically falls every few years. Growing seasons are long, typically from late February to late November. Along the gulf coast, it is not unusual for the lowest winter temperature to be above 30 degrees. Inland, there have been occasional blasts of cold air that have dropped temperatures into the teens and 20s, but these are rare. Hurricanes and tropical storms are an important part of the climate of southern Louisiana, with some impact occurring nearly every year in some part of the region. However, devastating storms do not occur too often, and heavy rain and storm surge are usually the biggest concerns, compared to wind damage. The following climatic data are averages from the five 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. Information can be accessed from specific weather stations at http://www.wrcc.dri.edu/coopmap/ or http://www.wrcc.dri.edu/summary/climsmla.html.

Table 3 Representative climatic features

Frost-free period (average)	260 days
Freeze-free period (average)	300 days
Precipitation total (average)	1,600 mm

- (1) LAFAYETTE RGNL AP [USW00013976], Breaux Bridge, LA
- (2) EUNICE [USC00162981], Eunice, LA
- (3) GRAND COTEAU [USC00163800], Opelousas, LA
- (4) LAFAYETTE [USC00165021], Lafayette, LA
- (5) NEW IBERIA ACADIANA AP [USC00166657], New Iberia, LA

Influencing water features

This site is generally described as a runoff site, where rainfall flows off of the site. However minor relief on portions of the site will slow runoff and in places allow some accumulation. The lower portions of this site will allow for a certain amount of accumulation and even ponding.

Water table depths will fluctuate according to season of the year. Typically the water table will be highest during the winter and early spring when warm season vegetation is not drawing moisture from the soil. Although ponding is not shown as a characteristic for the soils of this site, ponding may occur for brief to long periods during the growing season on micro-lows and influence the plant community. Some soils associated with this site are hydric or have hydric inclusions and may be wetlands.

Soil layers can exhibit an increase in finer soil particle size percentage (clay), which can form a layer which results in reduced infiltration and percolation of soil water. The inhibition of soil water movement through the soil results in wetter soil surface conditions, and poorer drainage. Originally, the Historic Plant Community consisted of tall grass species with extensive deep roots that penetrate the soil when the soil dries and cracks during normal dry cycles. Once the roots have formed in the cracks they provide continuous pore spaces to provide internal drainage of the soil.

Soil features

The soil series associated with this site are: Memphis, Loring, Kleinpeter, Duson, Coteau. They are Moderately deep to Moderately deep, Somewhat poorly drained to Well drained, and Slow to Moderate permeable soils, with very acidic to slightly acidic soil reaction, that formed in Loess.

Table 4. Representative soil features

Surface texture	(1) Silt (2) Silt loam
Family particle size	(1) Loamy
Drainage class	Somewhat poorly drained to well drained
Permeability class	Slow to moderate
Soil depth	60 – 80 cm
Surface fragment cover <=3"	Not specified
Surface fragment cover >3"	Not specified
Available water capacity (0-101.6cm)	16.51 – 22.1 cm
Calcium carbonate equivalent (0-101.6cm)	Not specified
Electrical conductivity (0-101.6cm)	Not specified
Sodium adsorption ratio (0-101.6cm)	Not specified
Soil reaction (1:1 water) (0-101.6cm)	10 – 6.2
Subsurface fragment volume <=3" (0-101.6cm)	Not specified
Subsurface fragment volume >3" (0-101.6cm)	Not specified

Ecological dynamics

The pre-settlement plant community of the Southwestern Loess Ridge Prairie Site on the Southwest Coastal Prairie was a tallgrass prairie. Soils, climate, fire, and grazing by native wild herbivores were the major influences on the plant community of this site. Historically Bison (Bison bison) and Elk (Cervus elapus) were the primary large ungulates that grazed the site. There are historic records that fires commonly occurred on the Southwest Coastal Prairie but none that definitively describe the frequency, timing, or intensity of fires.

Under the influences mentioned above, this prairie site was dominated by tallgrasses. Major tallgrass species include little bluestem (Schizachyrium scoparium), yellow Indiangrass (Sorghastrum nutans), big bluestem (Andropogon gerardii), switchgrass (Panicum virgatum), and eastern gamagrass (Tripsacum dactyloides). Perennial forbs are an important part of the site species composition and include ashy sunflower (Helianthus mollis), button snake root (Eryngium yuccifolium), gayfeather (Liatris spp.) and goldenrod (Solidago spp.). The species composition of this site varies to include 100s of species from several families and will vary along the moisture gradient. The micro-highs and lows on this site contribute to the diverse plant community; the micro-highs are slightly drier and the micro-lows slightly wetter. Elevation differences between highs and lows range from 6 to 15 inches (15 to 34 cm). Species tolerant of moist soil grows on the lower elevations of the while less water-tolerant vegetation grows on the higher elevations.

The Loess areas adjacent to the Mississippi River valley developed under a prairie Grassland community, although there was the encroachment of Oak and Hickory. Slope was a causal factor to break the fire regimes moving towards the Valley. Attributed not to reduced fire frequency but reduced intensity. As the dissected, erosional, landscapes has less moisture available to the plants during the growing season, production is reduced providing less fuel to carry the fire. Therefore fire intensity is reduced and allowed for the establishment of initially fire tolerant woody species which shaded the herbaceous layer and caused these species to further decrease which reduced fire intensity further which allowed for the encroachment to less fire tolerant woody species. Which provided a natural transition from Herbaceous to Forested Plant communities. A similar occurrence on the northern edge of the Prairie where the initial Forest Species was the Longleaf Pine which encroached into the Prairie and utilized moisture and shaded the herbaceous layer which further reduced the production and fuel which allowed for other woody species to colonize.

Excessive grazing by domestic livestock contributes to the reduction or elimination of eastern gamagrass, big bluestem, yellow Indiangrass, switchgrass, and little bluestem. As the tallgrass species are eliminated from the site, species such as brownseed paspalum (Paspalum plicatulum), bushy bluestem (Andropogon glomeratus), knotroot bristlegrass (Setaria parviflora), smutgrass (Sporobolus indicus), and shorter stature species such as carpet grass (Axonopus sp.), dallisgrass (Paspalum dilatatum), bahiagrass (Paspalum notatu) and bermudagrass (Cynodon dactylon) increase.

In addition to site change due to excessive grazing, farming has had a significant influence on the site. The site was not only changed through the loss of native plant communities from cultivation, but also through the change in soils, hydrology, and topography by ditching, and leveeing. Continued overuse of the site by livestock, lack of fire, or abandonment of cropping allows woody plants to invade. These woody pioneers include eastern baccharis (Baccharis halamifolia), hackberry (Celtis sp.), ash (Fraxinus sp.), and chinese tallow (Triadica sebifera).

As the plant community transitions from Tallgrass Prairie (1.1) to the Converted States (3, 4, 5, and 6), changes occur in plant composition, biomass production, litter accumulation, and water infiltration and storage. These changes influence most treatment alternatives including the ability to use fire as a management tool. The result has been the transition of this Southwestern Loess Ridge Prairie Ecological Site from a true prairie to Cropland, Pastureland, wooded grassland or Woodland.

The resulting increase in woody plant density signifies that a threshold has been crossed. Once this threshold is crossed, restoration back towards the historic plant community becomes much more difficult and expensive. Even though a plant community similar to the historic community may be restored through the use of a combination of practices such as brush management, re-seeding, prescribed grazing, and fire, this community cannot be maintained without the continuous use of these tools on a frequent basis. Also the expansive soil disturbance associated with transition to a converted state removes soil micro environmental factors which make restoration to the Historic Grassland State (1) highly unlikely.

Soil micro environmental factors that are limited in restoration include the native soil micro flora and fauna. The natural soil ecosystem is largely unknown and undocumented but there is variability in the macro flora from the various remnants that are found across the range of this site. These variations can easily be extrapolated into variability within the Micro flora and fauna for each location.

State and transition model

Figure 5. STM-134XY404 Southwestern Loess Ridge Prairie PES

Figure 6. STM_Legend-134XY404 Southwestern Loess Ridge PES

Additional community tables

Table 5. Community 1.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production ()	Foliar Cover (%)

Table 6. Community 1.2 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production ()	Foliar Cover (%)

Table 7. Community 2.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production ()	Foliar Cover (%)

Table 8. Community 2.2 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production ()	Foliar Cover (%)

Table 9. Community 3.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production ()	Foliar Cover (%)
Grass/Grasslike					
1	**Warm Season Grasses**			2242-5941	
	Bermudagrass	CYDA	*Cynodon dactylon*	2242-5941	0-98

Table 10. Community 3.2 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production ()	Foliar Cover (%)

Table 11. Community 3.3 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production ()	Foliar Cover (%)

Table 12. Community 4.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production ()	Foliar Cover (%)
Grass/Grasslike					
1	**Warm Season grasses**			5604-15692	
	Bermudagrass	CYDA	*Cynodon dactylon*	5604-15692	70-95

Table 13. Community 5.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production ()	Foliar Cover (%)

Table 14. Community 6.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production ()	Foliar Cover (%)

Table 15. Community 6.2 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production ()	Foliar Cover (%)

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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Approval

Marji Patz, 5/14/2025

Acknowledgments

I would like to acknowledge the MLRA 134 Technical Team for their support and assistance in drafting this site concept and Provisional Ecological Site Description.

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	09/18/2026
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:**

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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:**
