

Ecological site F135AY150AL

Deep Well to Moderately Well Drained Clay Acid Broad 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): 135A—Alabama and Mississippi Blackland Prairie

This MLRA has two narrow (less than 40 miles wide), long, arching bands known as the Blackland Prairie and the Jackson Prairie, which are characterized by clayey, soils with a high shrink-swell potential. Several major drainageways bisect this region on their way to larger tributaries. Very little native prairie vegetation remains due to agriculture and forestry activities. This area is in eastern Mississippi (57 percent) and central and western Alabama (43 percent). It makes up about 10,165 square miles (26,328 square kilometers). Most of this region is surrounded by the distinctly different MLRA 133C, which has sandy soils and stratified, coastal sediment mineralogy. A very small section of MLRA 135A has a diffuse boundary with MLRA 134 that occurs as a loess cap that gradually thins from west to east. (USDA, NRCS, 2022)

LRU notes

This ecological site can be seen in the Blackland Prairie, Jackson Prairie, and the Interior Flatwoods of MLRA 135A. Blackland Prairie: This physiographic region is a long crescent shaped land use area that starts in northeastern Mississippi and ends in central Alabama. The Blackland Prairie soils are formed from mostly calcareous coastal plains. These soils occur on low lying, flat, broad landscapes; they are mostly alkaline, heavy clays, with some weathered acid areas. The Blackland Prairie is interspersed native prairie and hardwood forests; this area is 90% cultivated. The Jackson Prairie: This physiographic region consists of a narrow band of soils that occurs in central Mississippi. These soils are gently sloping and formed from a heavy clay parent material. The Jackson Prairie is mostly acidic and weathered. This region is mostly a mixed conifer forest but does have some local pasture and cultivation. The Interior Flatwoods: This physiographic region consists of a narrow band, of soils which were formed out of an acid gray clay. This band of similar soils is situated directly west of the Blackland Prairie. These acid and clayey soils are flat, low lying, mostly saturated, hardwood forests with some areas in heavy cultivation.

Classification relationships

This area is in the East Gulf Coastal Plain section of the Coastal Plain province of the Atlantic Plain. The northern part of the area is a slightly elevated, hilly plain. The separate southwestern part is locally known as the Jackson Prairie portion of the East Gulf Coastal Plain section in Mississippi. (USDA, NRCS, 2022) National Vegetation Classification System Vegetation Association (NatureServe, 2010): The reference state for this system is comparable to *Quercus stellata* - *Quercus marilandica* - *Carya (tomentosa, pallida)* Woodland (CEGL003952). Additionally, *Pinus echinata* - *Quercus stellata* - (*Quercus marilandica*) Forest is highly represented (CEGL004053).

Ecological site concept

These sites are found on the uplands and slopes in the transition area between MLRA 135A (Blackland Prairie) and 133C (Gulf Coastal Plains). These sites have soils that are deep, well to moderately well drained, acidic, and clayey. Historically these sites are a mixture of hardwood and pine stands interspaced by grassy patches. Today, these sites are used for cotton, corn, and soybeans. Common trees in wooded areas include loblolly pine, shortleaf pine, southern red oak, post oak, sweetgum, and hickory.

Associated sites

R135AY110MS	Shallow to Moderately Deep Well Drained Silty Clay to Clay Alkaline Broad Flats These sites are in similar geomorphic positions with more dissected and steeper landscapes and shallower soils than F135AY150AL
R135AY130MS	Deep Moderately Well to Well Drained Clay Alkaline Broad Flats These sites are found in similar geomorphic positions with more calcareous soils than F135AY150AL
R135AY140MS	Deep Somewhat Poorly Drained Clay Alkaline Broad Flats These sites are traditionally lower on the landscape than F135AY150AL
F135AY160MS	Deep Somewhat Poorly Drained Clay Acid Broad Flats These sites are found in similar geomorphic positions the primary difference being a poorer drainage class than F135AY150AL
F135AY170AL	Deep Well Drained Fine Loamy Acid Broad Flats These sites have similar geomorphic positions and have a loamier texture than F135AY150AL
F135AY220MS	Deep Poorly Drained Clay Nonacid Floodplains These sites are found in the floodplains below F135AY150AL
F135AY230MS	Deep Somewhat Poorly Drained To Moderately Well Drained Clay Alkaline Floodplains These sites are found in the floodplains below F135AY150AL
F135AY250MS	Deep Moderately Well Drained Fine Loamy Acid Floodplains These sites are found in the floodplains below F135AY150AL
F135AY330MS	Deep Moderately Well Drained Fine Loamy Acid Flatwoods Uplands These sites are found lower on the landscape with gentler slopes than F135AY150AL
F135AY350AL	Deep Moderately Well Drained Clay Acid Flatwoods Slopes These sites are found lower on the landscape with gentler slopes than F135AY150AL
F135AY370MS	Deep Somewhat Poorly Drained Fine Loamy Acid Flatwoods Stream Terraces These sites are found on the stream terraces below F135AY150AL

F135AY390MS	Deep Somewhat Poorly Drained Fine Silty Acid Flatwood Floodplains These sites are found in the floodplains below F135AY150AL
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Similar sites

R135AY130MS	Deep Moderately Well to Well Drained Clay Alkaline Broad Flats These sites are alkaline as apposed to acid like F135AY150AL
F135AY160MS	Deep Somewhat Poorly Drained Clay Acid Broad Flats These sites have a poorer drainage class than F135AY150AL
F135AY170AL	Deep Well Drained Fine Loamy Acid Broad Flats These sites have a loamier texture than F135AY150AL
F135AY180MS	Deep Somewhat Poorly Drained To Moderately Well Drained Fine Silty Acid Broad Flats These sites have a siltier soil texture than F135AY150AL
F135AY310AL	Deep Moderately Well Drained Clay Acid Flatwoods Uplands These sites have very similar soils but are located in the flatwoods as opposed to the Blackland Prairie like F135AY150AL
F135AY330MS	Deep Moderately Well Drained Fine Loamy Acid Flatwoods Uplands These sites are located in the flatwoods and have a loamier soil textures as compared to F135AY150AL
F135AY350AL	Deep Moderately Well Drained Clay Acid Flatwoods Slopes These sites are located in the flatwoods and are found on greater slopes as compared to F135AY150AL

Table 1. Dominant plant species

Tree	(1) <i>Quercus stellata</i> (2) <i>Pinus taeda</i>
Shrub	(1) <i>Quercus alba</i> (2) <i>Quercus falcata</i>
Herbaceous	(1) <i>Smilax glauca</i> (2) <i>Vitis rotundifolia</i>

Physiographic features

Most of this area is underlain by Cretaceous-age clay, marl, soft limestone, or chalk of the Selma Group. The Jackson Prairie part, in southern Mississippi, and parts of the MLRA in southwest Alabama are underlain by Tertiary-age clay, marl, soft limestone, or chalk of the Vicksburg and Jackson Groups. (USDA, NRCS, 2022)

Table 2. Representative physiographic features

Landforms	(1) Upland > Flat (2) Upland > Ridge (3) Upland > Hillslope (4) Upland > Hill
Runoff class	Medium
Flooding frequency	None
Ponding frequency	None
Elevation	50 – 120 m
Slope	0 – 10 %
Water table depth	10 – 50 cm
Aspect	Aspect is not a significant factor

Table 3. Representative physiographic features (actual ranges)

Runoff class	Medium
Flooding frequency	None
Ponding frequency	None
Elevation	30 – 150 m
Slope	0 – 30 %
Water table depth	10 – 50 cm

Climatic features

This ecological site occurs in the thermic temperature regime for MLRA 135A. The thermic soil temperature regime has mean annual soil temperatures of 15 °C or more, but less than 22 °C; and a difference between mean summer and mean winter soil temperatures of greater than 6 °C at 50 cm below the surface.

The average annual precipitation is sampled from areas running the length of MLRA 135A. Rainfall is common throughout the year; with the maximum precipitation occurring in early winter, spring, and midsummer. The lowest rainfall occurs in autumn. The rainfall typically occurs during high intensity, convective thunderstorms in summer, but some heavy rains occur during tropical storms in winter.

Table 4 Representative climatic features

Frost-free period (characteristic range)	180-200 days
Freeze-free period (characteristic range)	220-240 days
Precipitation total (characteristic range)	1,370-1,470 mm
Frost-free period (actual range)	170-210 days
Freeze-free period (actual range)	200-240 days
Precipitation total (actual range)	1,350-1,500 mm
Frost-free period (average)	190 days
Freeze-free period (average)	230 days
Precipitation total (average)	1,420 mm

- (1) CORINTH 7 SW [USC00221962], Corinth, MS
- (2) RIPLEY [USC00227467], Ripley, MS
- (3) BOONEVILLE [USC00220955], Booneville, MS
- (4) TUPELO RGNL AP [USW00093862], Tupelo, MS
- (5) VERONA EXP STN [USC00229173], Tupelo, MS
- (6) FULTON 3 W [USC00223208], Fulton, MS
- (7) HOUSTON [USC00224265], Houston, MS
- (8) ABERDEEN [USC00220021], Amory, MS
- (9) STATE UNIV [USC00228374], Starkville, MS
- (10) COLUMBUS [USC00221880], Columbus, MS
- (11) BROOKSVILLE EXP STN [USC00221111], Brooksville, MS
- (12) LIVINGSTON [USC00014798], Livingston, AL
- (13) MARION JUNCTION 2 NE [USC00015121], Marion Junction, AL
- (14) MONTGOMERY AP [USW00013895], Hope Hull, AL
- (15) MONTGOMERY 6SW [USC00015553], Montgomery, AL
- (16) PELAHATCHIE [USC00226811], Pelahatchie, MS
- (17) FOREST [USC00223107], Forest, MS
- (18) MACON 3N [USC00225361], Macon, MS

Influencing water features

Due to the topographic position, this site does not have water features or wetlands.

Soil features

Soils associated with this site fall within the thermic temperature regime of MLRA 135A. The thermic soil temperature regime is defined as having a difference in soil temperature of 6 degrees C or more between mean summer (June, July, and August) and mean winter (December, January, and February) and a mean annual soil temperature of: 15 degrees C (59 degrees F) to 22 degrees C (72 degrees F). Soils in this ecological site are deep moderately well to well drained acid clay. This Ecological site is comprised of Oktibbeha and Hannon soil series with Oktibbeha being the modal concept for this site.

Please note that the soils listed in this section of the description may not be all inclusive. There may be additional soils that fit the site's concepts. Additionally, the soils that provisionally form the concepts of this site may occur elsewhere, either within or outside of the MLRA and may or may not have the same geomorphic characteristics or support similar vegetation. Some soil map units and soil series included in this "provisional" ecological site were used as a "best fit" for a particular soil – landform catena during a specific era of soil mapping, regardless of the origin of parent material or the location of MLRA boundaries. Therefore, the listed soils may not be typical for MLRA 135A or a specific location, and the associated soil map units may warrant further investigation in a joint ecological site inventory – soil survey project. When utilizing this provisional description, the user is encouraged to verify that the area of interest meets the appropriate ecological site concepts by reviewing the soils, landform, vegetation, and physical location. If the site concepts do not match the attributes of the area of interest, please review the Similar or Associated Sites listed in the General Information section of this description to determine if another site may be a better fit for your area of interest.

Table 5. Representative soil features

Parent material	(1) Marine deposits – chalk
Surface texture	(1) Clay loam (2) Clay (3) Silty clay (4) Silty clay loam (5) Fine sandy loam (6) Silt loam (7) Sandy loam
Drainage class	Somewhat poorly drained to moderately well drained
Permeability class	Very slow
Soil depth	170 – 200 cm
Surface fragment cover <=3"	Not specified
Surface fragment cover >3"	Not specified
Available water capacity (0-101.6cm)	11.94 – 20 cm

Soil reaction (1:1 water) (0-25.4cm)	4.5 – 7.3
Subsurface fragment volume <=3" (0-177.8cm)	Not specified
Subsurface fragment volume >3" (0-177.8cm)	Not specified

Table 6. Representative soil features (actual values)

Drainage class	Somewhat poorly drained to moderately well drained
Permeability class	Very slow to moderately slow
Soil depth	120 – 200 cm
Surface fragment cover <=3"	0 %
Surface fragment cover >3"	0 %
Available water capacity (0-101.6cm)	7.37 – 19.3 cm
Soil reaction (1:1 water) (0-25.4cm)	3.5 – 8.4
Subsurface fragment volume <=3" (0-177.8cm)	0 %
Subsurface fragment volume >3" (0-177.8cm)	0 %

Ecological dynamics

This Ecological site has eight states: Fire Dependent Forest, Fire Suppressed Forest, Temporary Post Disturbance Grassland, Silviculture, Pasture, Cropland, Aquaculture, and Conservation Area.

The reference state for this ecological site is Fire Dependent Forest. This state is characterized as having fire resistant (blackjack oak...) and fast growing (loblolly and shortleaf pine) trees in the overstory with a grassy and herbaceous understory. Due to the regular fire

regimes these resistant and fast growing species were given an advantage allowing them to dominate the landscape. In the time since fire suppression has become more common the representation of this community has greatly decreased.

Fire Suppressed Forest is a community comprised of mixed hardwoods and pines interspaced by a herbaceous understory. This community occurs in two phases, "wetter" and "drier". For the provisional phase of ecological site development, it is difficult to determine which of these phases is typical for this site. In future stages of ESD development, when there is more data, it will be possible to determine how common these phases occur on this ecological site.

Temporary Post Disturbance Grassland is a community that occurs after a large-scale disturbance on these sites. This disturbance can be either management driven (clearcutting, abandonment, etc.) or naturally occurring (fire, etc.). This phase is temporary, if management continues the landscape will shift into whatever state is being managed for. If a site is not being managed post disturbance it will likely transform into a forest community. Plants that occur on this site depend largely on what was growing prior to the disturbance.

The Silviculture community is predominantly used to grow loblolly pine for wood production and wildlife habitat.

Pasture is a grassland that occurs as a result of heavy land management changes (clearcutting, herbicide, grazing, planting etc.) in order to produce livestock forage or hay. Pasture differs from native grassland as the plant species in the pasture are typically selected and planted specifically for forage quality.

Cropland occur as a result of heavy land management changes (clearcutting, herbicide, tilling, etc.) in order to produce crops. Common crops for this ecological site are cotton, corn, and soybeans.

Aquaculture in this region is predominantly used for the production of catfish. Most producers in this region will excavate ponds at a uniform depth in flat heavy clay areas.

Conservation areas are sites set aside to try and recapture the historical plant and animal communities of the reference state. These states will never be a perfect replication because of anthropogenic and natural changes to the ecological system.

State and transition model

Additional community tables

Table 7. Community 1.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production ()	Foliar Cover (%)
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Table 8. Community 2.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production ()	Foliar Cover (%)
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Table 9. Community 2.2 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production ()	Foliar Cover (%)
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Table 10. Community 3.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production ()	Foliar Cover (%)
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Table 11. Community 4.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production ()	Foliar Cover (%)
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Table 12. Community 5.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production ()	Foliar Cover (%)
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Table 13. Community 6.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production ()	Foliar Cover (%)
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Table 14. Community 7.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production ()	Foliar Cover (%)
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Table 15. Community 8.1 plant community composition

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

Data collection and analysis of field data will be performed during the Verification Stage of ESD development.

Other references

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Contributors

Peyton Fralick

Approval

Charles Stemmans, 5/29/2025

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)	Peyton Fralick
Contact for lead author	Peyton Fralick Peyton.Fralick@usda.gov 662-205-3404
Date	09/06/2026
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:

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:
