USDA Natural Resources Conservation Service

Ecological site F134XY307LA
West Central Loess Ridge - PROVISIONAL

Accessed: 05/11/2025

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)
The Natural Communities of Louisiana - (Louisiana Natural Heritage Program - Louisiana Department of Wildlife and Fisheries)
EPA Level IV Ecoregion

Ecological site concept

The site is characterized 0 to 5% slopes of Moderately Well Drained to Well Drained soils found on higher landscape positions of loess influence on the Macon Ridge. Potential Soil Limitations that may be found on the site could include fragipan or restrictive layers and/or high exchangeable Al (Aluminum). This soil chemistry limitation is significant because, Aluminum (Al) toxicity limits production on strongly acidic soils, pH values at or below 5, toxic forms of Al solubilized into the soil solution, inhibiting root growth and function (Kochian 2005). Potential species composition of this site will include White oak, Delta Post Oak, Cherrybark Oak, Shagbark Hickory, Shumard Oak, Swamp Chestnut, Sycamore, Loblolly Pine and Sweetgum. This site has been described as a very diverse Upland Community.

Associated sites

F134XY308LA	**West Central Scarp And Steep Loess Ridge - 5% & Greater Slope - PROVISIONAL** The Scarp and Steep Loess Ridge site will be found adjacent to this site and will be the areas that are greater than 5% slope.

Similar sites

F134XY306LA	**West Central Well Drained Loamy Ridge - PROVISIONAL** The Well Drained Loamy Ridge site will be found at a lower landscape position.

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 (Allen 1993).

This PES occurs on silty, long, narrow ridges, summits, escarpments (short steep backslopes) and steep convex slopes on gently sloping to strongly sloping uplands and terraces on the eastern edge of the loess-mantled Macon Ridge in Arkansas and Louisiana. Slopes are gently sloping to strongly sloping (5 to 20 percent). These sites include ridges, summits and escarpments mainly along the eastern edge of Macon Ridge above the floodplain of Bayou Macon. There are a few small areas of ridges and summits along the eastern side of the Boeuf River.

Table 2. Representative physiographic features

Landforms	(1) Ridge (2) Escarpment
Flooding frequency	None
Ponding frequency	None
Elevation	50–150 ft
Slope	0–5%
Ponding depth	0 in
Water table depth	18–72 in
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)	59 in

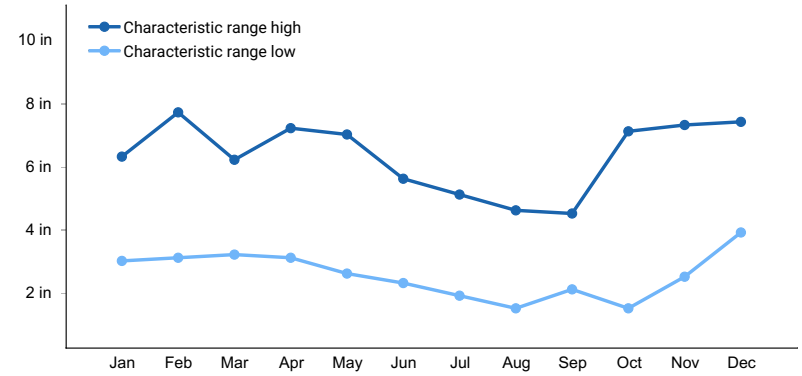

Figure 1. Monthly precipitation range

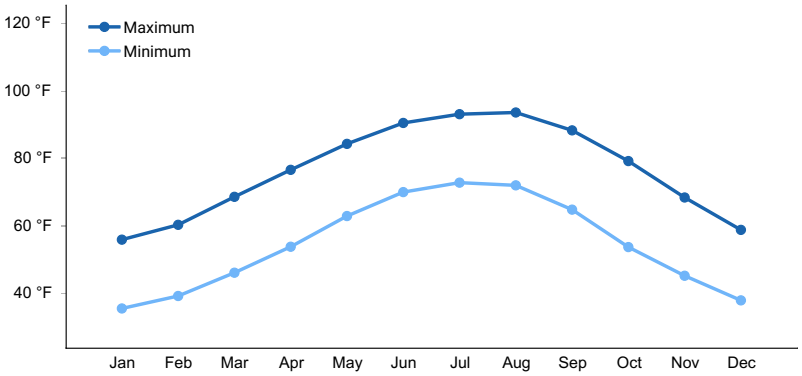

Figure 2. Monthly average minimum and maximum temperature

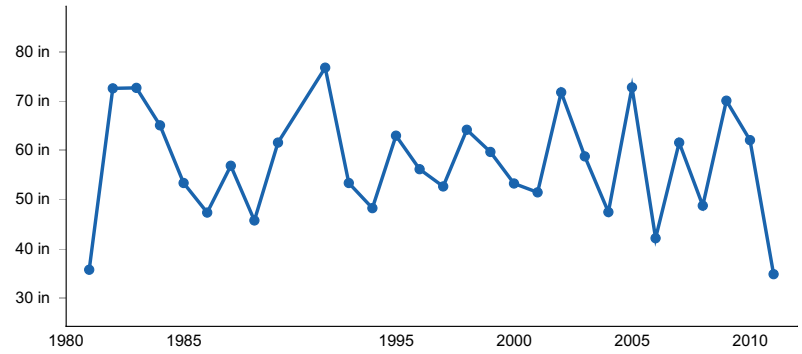

Figure 3. Annual precipitation pattern

Climate stations used

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

Influencing water features

This site is moderately to well drained, sheds runoff and the soils are moderately permeable. There is limited

amounts of water that influence the site other than the rainfall that is intercepted and allowed to percolate into the soil profile. Some of the soils will develop a Fragipan or a slowly permeable horizon, these moderately well drained fragipan soils have a seasonal perched water table 1.5 to 3.0 feet in depth and above the fragipan in winter and early spring in normal years.

Soil features

Soils are well drained, Ultic Hapludalfs (Goodwill), well drained, Typic Hapludalfs (Memphis), moderately well drained, Typic Fragiudalfs (Gigger), moderately well drained, Oxyaquic Fraglossudalfs (Grenada), and moderately well drained, Oxyaquic Fragiudalfs (Loring). These soils formed from thick loess deposits and mixed thin loess and loamy sediments of late Pleistocene Age. Slopes range from 0 to 5 percent. These deep to very deep soils are found on long, narrow ridges, summits, and natural levees on nearly level to gently sloping uplands and stream terraces. These soils range from moderately permeable to slowly permeable (within the fragipan). These soils are not considered hydric. The moderately well drained fragipan soils have a seasonal perched water table 1.5 to 3.0 feet in depth and above the fragipan in winter and early spring in normal years. The well drained soils have a water table deeper than 6 feet. These soils are not subject to flooding. These soils have land use limitations: 1) rooting depth restriction due to the fragipan, and (2) susceptible to erosion due to silt loam surface texture and slopes greater than 3 percent.

Table 4. Representative soil features

Surface texture	(1) Silt loam
Family particle size	(1) Loamy
Drainage class	Well drained to moderately well drained
Permeability class	Slow to moderate
Soil depth	60–80 in
Surface fragment cover <=3"	0%
Surface fragment cover >3"	0%
Available water capacity (0-40in)	0.06–0.23 in
Electrical conductivity (0-40in)	0 mmhos/cm
Sodium adsorption ratio (0-40in)	0
Soil reaction (1:1 water) (0-40in)	3.6–6.5
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 hardwood species. Potential species composition of this site will include White oak, Delta Post Oak, Cherrybark Oak, Shagbark Hickory, Shumard Oak, Swamp Chestnut, Sycamore, Loblolly Pine and Sweetgum. This site has been described as a very diverse Upland Community. Some trees can be uprooted by climatic events, such as strong winds. With these events, openings in 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 an age gradient within a forest stand from the herbaceous openings to mature hardwoods.

This site has been altered by human activity and is utilized for multiple production systems such Cropland, Pasture and Tree Farms. Within the alternative uses of the site the transitions will be very similar and require the input of

resources such as installation of infrastructure needs and establishment of the desired species.

This PES occurs on deep to very deep soils are found on long, narrow ridges, summits, and natural levees on nearly level to gently sloping uplands and stream terraces of the Loess Plain. Located on the Macon Ridge in Louisiana and Arkansas. The differentiation between this and the adjacent sites is the slope gradient from nearly level up to 5%.

State and transition model

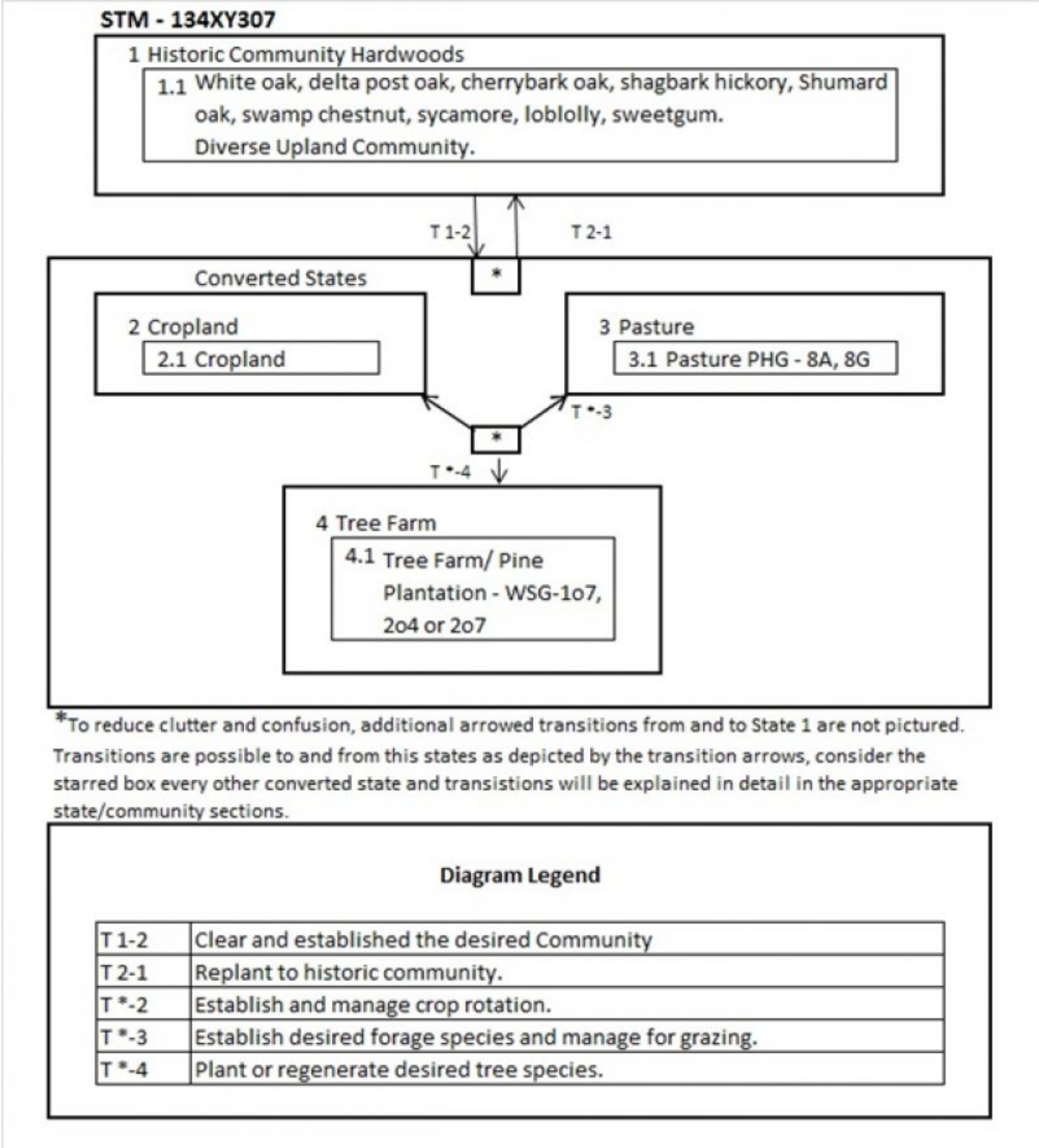

Figure 5. 134XY307LA_West_Central_Loess_Ridge-PES_STM

State 1

Historic Community - Hardwoods

Historically hardwood forest potentially containing White oak, Delta Post Oak, Cherrybark Oak, Shagbark Hickory, Shumard Oak, Swamp Chestnut, Sycamore, Loblolly Pine and Sweetgum. This site has been described as a very diverse Upland Community.

Community 1.1
Hardwood

White oak, Delta Post Oak, Cherrybark Oak, Shagbark Hickory, Shumard Oak, Swamp Chestnut, Sycamore, Loblolly Pine and Sweetgum. This site has been described as a very diverse Upland Community.

State 2
Cropland

Cropland

Community 2.1
Cropland

Row Crop Production

State 3
Pastureland

Managed Pasture - PHG 8A or 8G

Community 3.1
Pasture

Pasture or Grassland This phase is characterized by a monoculture of or a mixture of forage species planted or allowed to establish from naturalized species, managed for forage production or as herbaceous ground cover. This Site fits into multiple Pasture & Hayland Groups: 8A or 8G • 8-Upland, deep, medium-textured soil • A – soils having few limitations for the growth of the commonly grown plants except for slope • G – unfavorable chemical properties such as excessive salts, high exchangeable sodium, unfavorable soil reaction or toxic materials From these bullet descriptions of the Groups this site would generally be described as a Deep, Medium textured soil on Uplands with few limiting factors but potential for soil chemistry limitations. 8A - Deep, poorly drained, clayey bottomland soils with clayey surface layers. Natural fertility is medium to high. 8G - Upland and stream terrace soils mostly with silty surface layers and silty or clayey subsoils. Mainly poorly drained, acid soils of low natural fertility. 0-3% slopes. Most slopes are 0-1%.. All soils need nitrogen fertilization for production when grasses are grown alone. It is not practical to apply high rates of fertilizer due to the wetness limitation potential of the site which normally occurs from December through June. To prevent extreme acidity in the subsoil when high rates of acidifying nitrogen is used, the surface soil should not be allowed to become more acid than 5.0 pH and lime should be applied at more frequent intervals. Adapted Grasses and Legumes 8A - Bahia, common and hybrid bermuda are the better adapted warm season perennials. Ball, arrowleaf, and crimson are good cool season legumes to use. Take cattle off legumes as they begin to seed and graze grass close in fall so that the legumes can germinate. Without fertilization these soils will normally support a cover of pinehill bluestem, slender bluestem, threeawns, broomsedge, carpet and bermudagrass. Periodic brush control is needed to keep pasture from reverting to woodland. 8A - Bahia and common bermuda are adapted. The adapted cool season legumes are white clover, winter peas, and vetch. White clover requires a higher level of calcium and phosphorus than peas or vetch. Tall fescue does well on these soils if good management is applied. Without fertilization, these soils will normally support a cover of little bluestem, slender bluestem, threeawns, broomsedge and carpetgrass.

Table 5. Annual production by plant type

Plant Type	Low (Lb/Acre)	Representative Value (Lb/Acre)	High (Lb/Acre)
Grass/Grasslike	2600	6000	13000
Total	**2600**	**6000**	**13000**

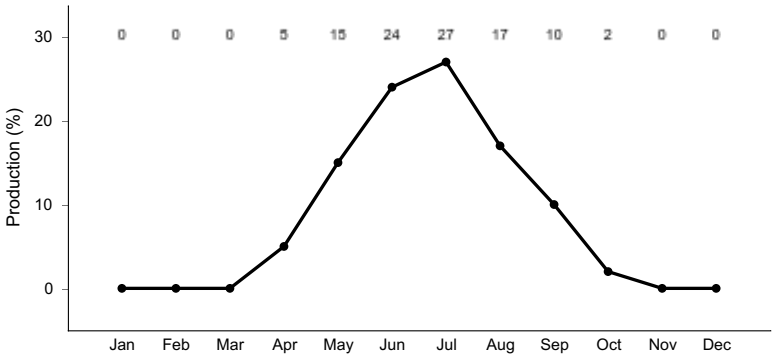

Figure 7. Plant community growth curve (percent production by month). LA0012, Bahia. Bahiagrass.

State 4
Tree Farm

Tree Farm

Community 4.1
Tree Farm

Hardwood or Pine Plantation: This phase is characterized by few or a monoculture of Hardwood or Pine species planted or allowed to regenerate from seed trees managed for wood production. This Site fits into multiple Woodland Suitability Groups (1o7, 2o4, 2o7) depending on the soil Mapunit. The first part of the symbol indicates potential productivity of the soils for important trees, very high (1), high (2). The second part, a letter, indicates the major kind of soil limitation, the letter "o" indicates that limitations or restrictions are insignificant. The third part of the symbol, a numeral, indicates the kind of trees for which the soils are best suited and the severity of the hazard or limitation. The numeral 4 indicate slight limitations, and suitability for broadleaf trees. The numeral 7 indicate slight limitations, and suitability for both needle leaf and broadleaf trees. These groups would generally describe this site as very high to high productivity with slight limitations for the production of broadleaf and some needle leaf species. WSG 1o7 Well drained loam soils suitable for either pines or southern hardwoods with very high potential productivity; no serious management problems. Potential is high for management of turkey and quail, and moderately high for squirrels and deer. WS 2o4 Well drained, loamy soils with high potential productivity; no serious management problems; best suited for southern hardwoods. Site index for green ash 80, cottonwood 100, oaks and sweetgum 90. Potential is high for management of deer, turkey, and squirrels. WS 2o7 Well drained, loamy soils with high potential productivity; no serious management problems; well suited for either pine or southern hardwoods. Site index for loblolly and slash pine 90, oaks and sweetgum 90. Potential is high for management of quail and turkey, and moderately high for squirrels and deer.

Additional community tables

Table 6. Community 3.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production (Lb/Acre)	Foliar Cover (%)
Grass/Grasslike					
1				2600–13000	
	Bermudagrass	CYDA	*Cynodon dactylon*	2600–13000	–
	bahiagrass	PANO2	*Paspalum notatum*	3300–6500	–

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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Acknowledgments

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:**

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:

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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:**
