USDA Natural Resources Conservation Service

Ecological site F134XY304LA
West Central Somewhat Poorly Drained Flats - PROVISIONAL

Accessed: 05/04/2024

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

Ecological site concept

Fine Silty Somewhat poorly drained nearly level areas found on low ridges and knolls in the braided stream terraces of the Macon Ridge Loess Plain. These sites are loamy soils of little to no loess influence. Common species composition would include Cherrybark Oak, Sweetgum, Water Oak & Loblolly Pine.

Associated sites

F134XY306LA	**West Central Well Drained Loamy Ridge - PROVISIONAL** These site are found on similar landscapes, however this site is somewhat poorly Drained.

Similar sites

F134XY305LA	**West Central Somewhat Poorly Drained Loess Terrace - PROVISIONAL** The West Central Somewhat Poorly Drained Loess Terrace is similar to this site however has a thicker Loess surface than this site.

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 PES occurs on loamy and silty low ridges and knolls, and broad level flats between large creeks, rivers, and drainageways on the loess-mantled Macon Ridge braided stream terrace in Louisiana. Slopes are nearly level to gently undulating (0 to 3 percent). These sites include low ridges and knolls, and broad level areas between the floodplains of the Boeuf River and Bonne Idee, and other former channels and distributaries of the Arkansas River such as: Cypress Bayou, Big Colewa Creek, Big Creek, Bee Bayou, Muddy Bayou, Turkey Creek, Daves Bayou, Grayson Bayou, Burns Bayou, Eagle Creek, Goose Creek, and Hurricane Slough.

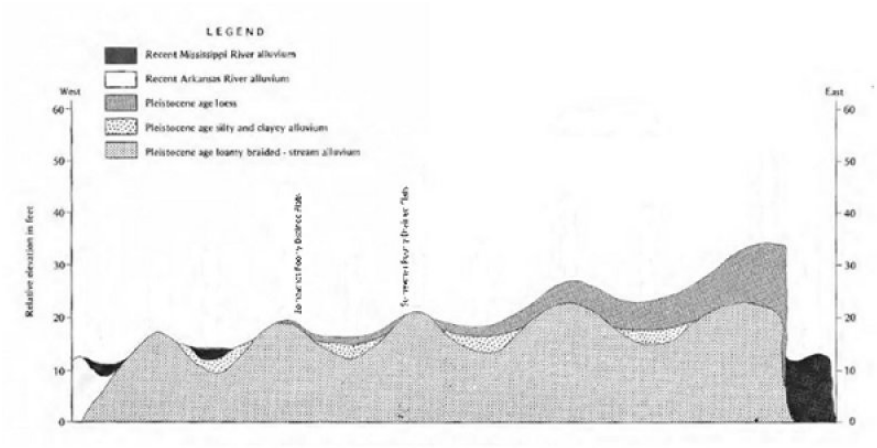

Figure 1. 134XY304 PES Landscape Diagram

Table 2. Representative physiographic features

Landforms	(1) Ridge (2) Terrace (3) Knoll
Flooding frequency	None
Ponding frequency	None

Elevation	15–30 m
Slope	0–3%
Ponding depth	0 cm
Water table depth	46–76 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

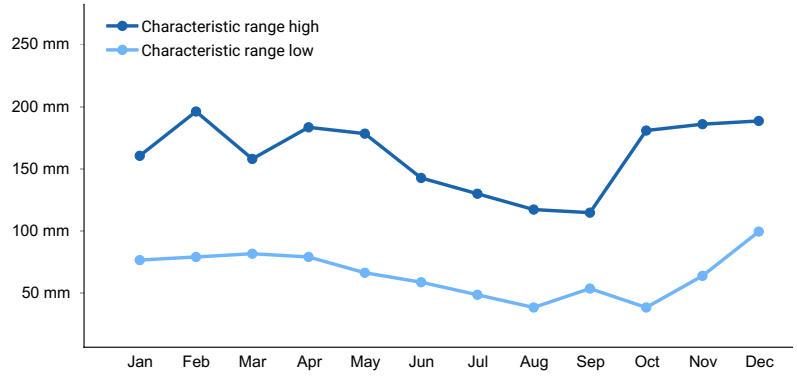

Figure 2. Monthly precipitation range

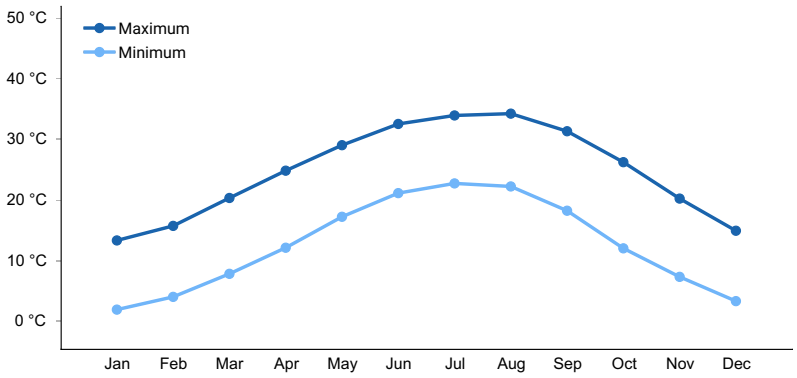

Figure 3. Monthly average minimum and maximum temperature

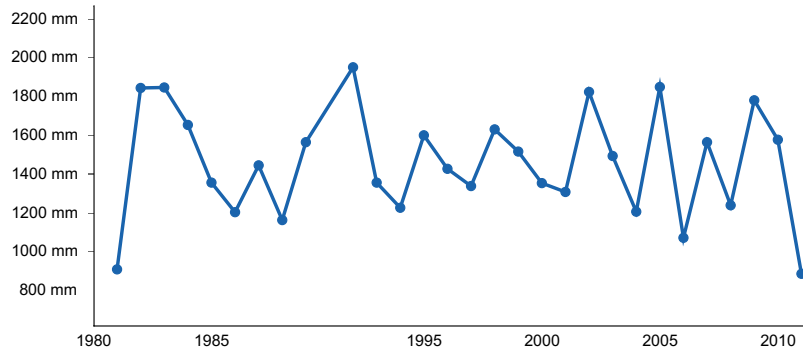

Figure 4. Annual precipitation pattern

Climate stations used

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

Influencing water features

Hydrology on this site is very important and when water is limited by drought or removal by other means vegetative composition will be affected by soil chemistry.

This site is generally found on ridges and knolls so it will shed water. However they are slowly permeable soils, which will hold available water in the soil profile. They can have a perched water table at or within 1.5 to 2.5 feet of the surface during winter and spring months in normal years.

Soil features

Soils are somewhat poorly drained, Typic Endoaqualfs (Idee), and Aquic Fraglossudalfs (Necessity). These soils formed from mixed loamy and silty braided stream alluvium, with little to no loess influence, of late Pleistocene Age. Slopes range from 0 to 3 percent. These very deep, moderately slow and slowly permeable soils are found on low ridges and knolls and broad level flats in the braided stream terraces. These soils are not considered hydric and the water table is at or within 1.5 to 2.5 feet of the surface during winter and spring months in normal years. These soils are not subject to flooding.

Table 4. Representative soil features

Surface texture	(1) Silt loam
Family particle size	(1) Loamy
Drainage class	Somewhat poorly drained
Permeability class	Moderately slow to slow
Soil depth	152–203 cm
Surface fragment cover <=3"	0%
Surface fragment cover >3"	0%
Available water capacity (0-101.6cm)	0.38–0.61 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)	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 bottomland hardwood species. Within this site there will be a gradient of wetness, the wetness variations will dictate the species that are present and the composition of them within an area.

Some trees can be uprooted by climatic events, such as strong winds or floods. 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 bottomland hardwoods.

This site has been altered by human activity and is utilized for multiple production systems such as Aquaculture, Cropland, Pasture and Tree Farms, for all of these alternative states wetness is a limitation for this site for productivity and management activities. 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 Somewhat poorly drained nearly level areas and on low ridges and knolls in braided stream terraces of the Loess Plain, these sites are loamy soils of little to no loess influence. Located on the Macon Ridge in Louisiana.

State and transition model

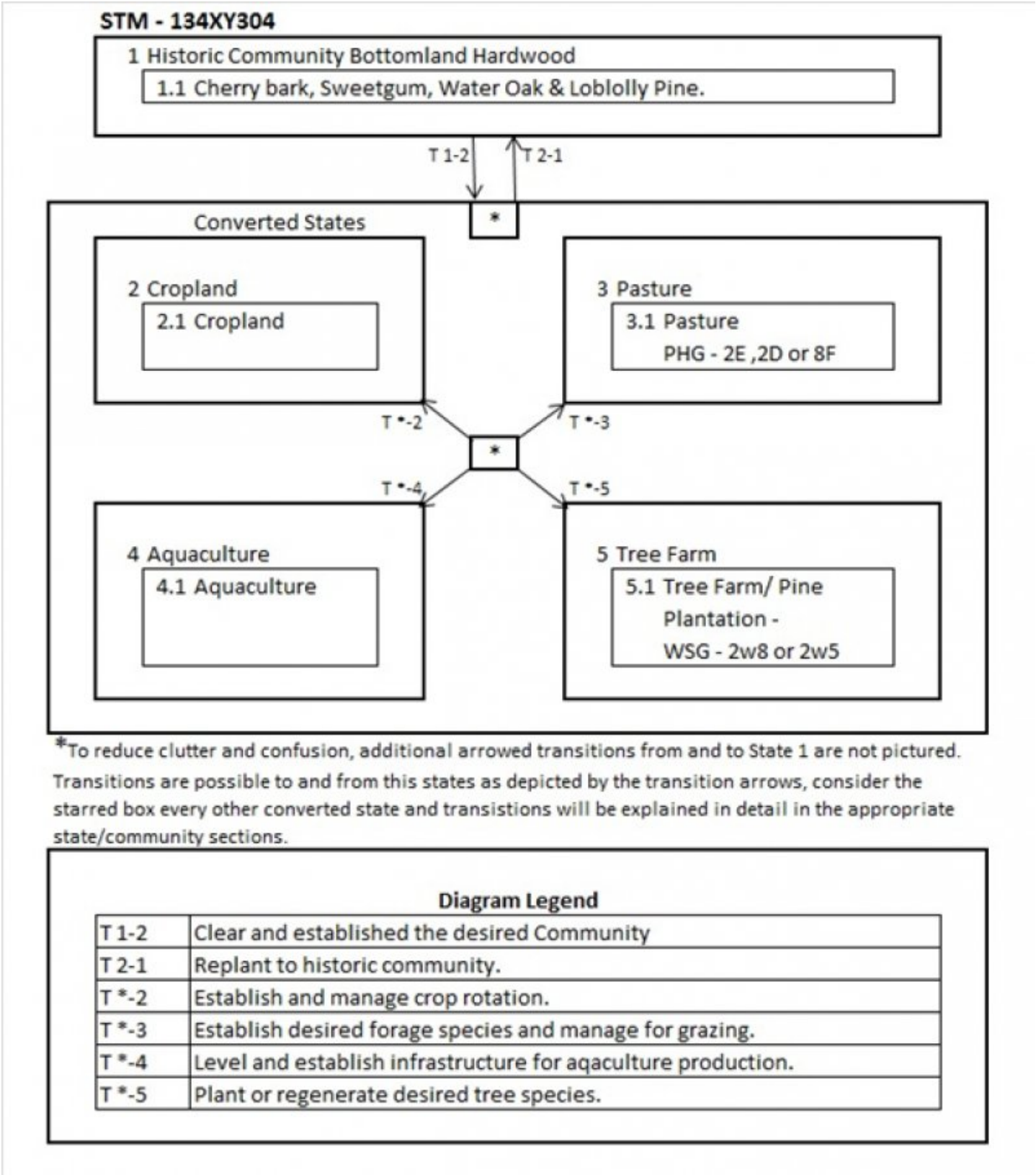

Figure 6. 134XY304LA West Central Somewhat Poorly Drained FI

State 1
Historic Community - Bottomland Hardwoods

Historically bottomland hardwoods Cherrybark Oak, Sweetgum, Water Oak & Loblolly Pine. Community species would have a range of wetness tolerance from wettest to the driest areas of the site.

Community 1.1
Bottomland Hardwood

Cherrybark Oak, Sweetgum, Water Oak & Loblolly Pine. Community species would have a range of wetness tolerance from Water oak and Sweetgum up to Cherrybark oak and Loblolly pine in the driest areas of the site.

State 2
Cropland

Cropland

Community 2.1
Cropland

Row Crop Production

State 3
Pastureland

Managed Pasture - PHG 2D, 2E or 8F

Community 3.1
Pasture

Pasture or Grassland This phase is characterized by a monoculture of or 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: 2D, 2E or 8F • 2-Bottomland, deep, medium-textured soil • 8-Upland, deep, medium-textured soil • E – shallow soils • D – organic soils – restrictions due to wetness and traffic ability • F – soils with restricted rooting depth because of fragipans, claypans and other slowly permeable layers which restrict growth and adaptation From these bullet descriptions of the Groups this site would generally be described as a Deep, Medium textured soil on Uplands and alluvial bottoms. It has a range of limiting factors from wetness to root restricting layers. Soils descriptions of some of the soils note a presence or a potential for a Fragipan or fragic layer. 2D - Bottom land soils that mainly have loamy surface layers and loamy subsoils. Mainly well or moderately well drained, acid, bottom land soils of low or medium natural fertility. Includes some somewhat poorly drained soils and some soils that are subject to rare or occasional overflow for brief periods. 0-5% slopes. Only a few soils occur on 3 to 5% slopes. 2E - Bottom land soils in a ridge and slough landscape. The soils are variable textured. Natural fertility is high or medium. 0-5% slopes. Most soils occur on 0-3% slopes and the topography is undulating. 8F - Silty upland and stream terrace soils that formed in loss or silty alluvium. The soils have a silty surface layer and a silty or clayey subsoil. Somewhat poorly drained, acid soils of low or medium natural fertility. 0-5% slopes. 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 2D- Hybrid bermuda, common bermuda, bahia and johnsongrass are the better adapted warm season perennials. White clover is the better cool season legume. Winter peas, vetch and red clover are well adapted. Fescue is adapted and can be used on these soils with good management. Fescue needs annual applications of nitrogen and should not be grazed in the summer. Without fertilization these soils will normally support a cover of switchgrass, indiangrass, wildryes, lespedeza and bermudagrass. 2E- Bermudagrass, johnsongrass, and bahia grow well if surface drainage is adequate. Fescue is adapted and can be grown. Fescue needs annual applications of nitrogen and should not be grazed in the summer. Without fertilization these soils will normally support a cover of little bluestem, switchgrass, indiangrass, wildryes, carpetgrass and bermuda grass. Periodic brush control is needed to prevent the area from reverting to woodland. 8F- 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 (Kg/Hectare)	Representative Value (Kg/Hectare)	High (Kg/Hectare)
Grass/Grasslike	2466	4483	11208
Total	**2466**	**4483**	**11208**

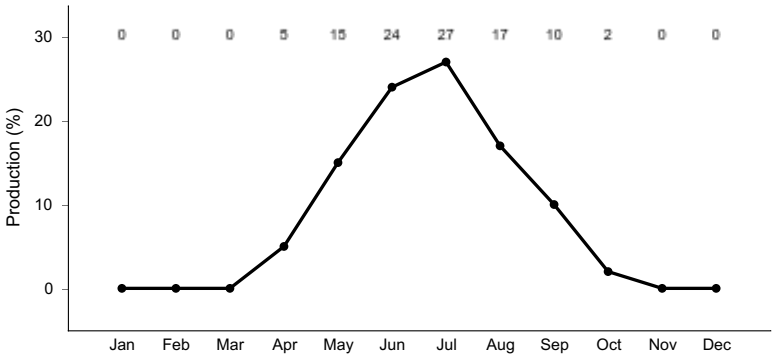

Figure 8. Plant community growth curve (percent production by month). LA0012, Bahia. Bahiagrass.

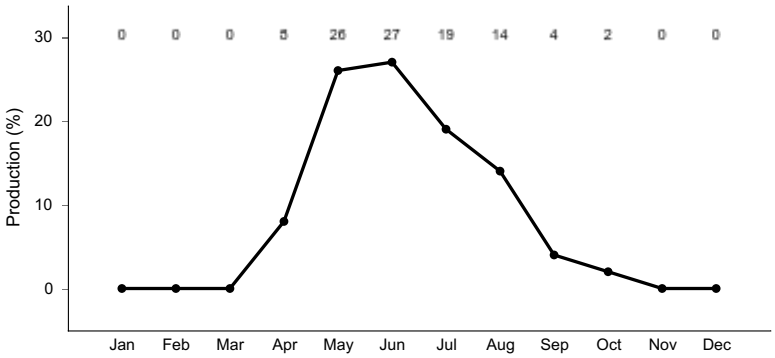

Figure 9. Plant community growth curve (percent production by month). LA0018, Johnsongrass. Johnsongrass.

State 4
Aquaculture

Aquaculture

Community 4.1
Aquaculture

Aquaculture Production

State 5
Tree Farm

Tree Farm

Community 5.1
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 (2w5, 2w8) depending on the soil Mapunit. The first part of the symbol indicates potential productivity of the soils for important trees, high (2). The second part, a letter, indicates the major kind of soil limitation, limitation of excessive water in or on the soil (w). 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 5 indicate moderate limitations and suitability for broadleaf trees. The numeral 8 indicate moderate limitations and suitability for

both needle leaf and broadleaf trees. These groups would generally describe this site as moderately high productivity with moderate limitations for wetness for the production of broadleaf and some needle leaf species. WS 2 w 5 Moderately wet, loamy and clayey soils with high potential productivity; moderate equipment limitations and slight to moderate seedling mortality due primarily to excess water; best suited for southern hardwoods. Site index for green ash 80, cottonwood 110, oaks and sweetgum 90. Potential is high for management of deer, turkey, squirrels and ducks. WS 2 w 8 Slightly to moderately wet, acid, loamy and clayey soils with high potential productivity; moderate equipment limitations due primarily to excess water; well suited for either pines or southern hardwoods. Site index for loblolly and slash pine 90, oaks and sweetgum 90. Potential is high for management of turkey and moderately high for deer, ducks, quail and squirrels.

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**			2466–11208	
	Johnsongrass	SOHA	*Sorghum halepense*	6389–11208	–
	Bermudagrass	CYDA	*Cynodon dactylon*	2466–10088	–
	bahiagrass	PANO2	*Paspalum notatum*	3699–6165	–

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:**

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:**