

Ecological site F131BY005AR

Wet Clay Bottomland

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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): 131B–Arkansas River Alluvium

Major Land Resource Area (MLRA) 131B, the Arkansas River Alluvium, is in Arkansas (67 percent) and Louisiana (33 percent). It makes up about 3,955 square miles. The towns of Montrose, Dumas, and England, Arkansas, and Monroe, Louisiana, are in this MLRA. Interstate 20 passes through Monroe, Louisiana. Most parts of the Overflow National Wildlife Refuge, the Upper Ouachita National Wildlife Refuge, and the D'Arbonne National Wildlife Area are in this MLRA.

Classification relationships

USDA-Natural Resources Conservation Service, 2006. -Major Land Resource Area (MLRA) 131B

Ecological site concept

The ecological site has very deep, very poorly drained soils that are ponded throughout a portion of the year. A wetland plant community exists because it is the lowest position on the landscape, along with the flooding and ponding regimes.

Associated sites

F131BY006AR	Clayey Flood Plain Site is not as wet and does not pond for as long.
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Similar sites

F131CY004LA	Wet Clay Bottomland Site is very similar, except in a different MLRA.
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Table 1. Dominant plant species

Tree	(1) <i>Taxodium distichum</i>
Shrub	Not specified
Herbaceous	(1) <i>Carex</i>

Physiographic features

These level to depressional soils are in backswamps, sloughs and abandon oxbows of the Arkansas River, Red River, and their tributaries. Slopes range form 0 to 1 percent. These soils are typically ponded with water, 0.5 to 5 feet, for 10 or more months in a normal year.

Table 2. Representative physiographic features

Landforms	(1) Alluvial plain > Flood plain (2) Alluvial plain > Backswamp
Runoff class	Negligible
Flooding duration	Long (7 to 30 days) to very long (more than 30 days)
Flooding frequency	Frequent
Ponding duration	Long (7 to 30 days) to very long (more than 30 days)
Ponding frequency	Frequent
Elevation	30 – 80 m
Slope	0 %
Ponding depth	20 – 150 cm
Water table depth	0 cm
Aspect	Aspect is not a significant factor

Climatic features

The average annual precipitation is 56 inches, which increases from north to south. Most of the rainfall occurs as frontal storms during late fall, winter, and early spring, although an appreciable amount of precipitation also occurs as convective thunderstorms during the early part of the growing season. The total amount of the precipitation that occurs as snow ranges from less than one percent in the southern part of the MLRA to five percent in the northern part. Temperatures range from highs in the low 90's during the summer to lows in the low 30's during the winter. The frost-free period averages 222 days, while the freeze-free period averages 256 days.

Table 3 Representative climatic features

Frost-free period (average)	220 days
Freeze-free period (average)	260 days

Precipitation total (average)	1,420 mm
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- (1) DERMOTT 3 NE [USC00031962], Dermott, AR
- (2) DUMAS [USC00032148], Dumas, AR
- (3) PORTLAND [USC00035866], Portland, AR
- (4) RAYVILLE [USC00167691], Rayville, LA
- (5) MONROE ULM [USC00166314], Monroe, LA
- (6) MONROE RGNL AP [USW00013942], Monroe, LA
- (7) ROHWER 2 NNE [USC00036253], Pickens, AR
- (8) COLUMBIA LOCK [USC00161979], Columbia, LA
- (9) KEO [USC00033862], England, AR
- (10) BASTROP [USC00160537], Bastrop, LA

Influencing water features

This site is influenced by proximity to backswamps, sloughs and abandon oxbows of the Arkansas River, Red River, and their tributaries. Sites are inundated from 0.5 to 5 feet up to 10 months in a normal year.

Wetland description

Soils associated with this site have a hydric soil rating. An on-site wetland determination is recommended.

Soil features

The Yorktown series consists of very deep, very poorly drained, very slowly permeable soils that formed in clayey alluvium. Only Yorktown is correlated to this ecological site. The taxonomic classification is a very-fine, smectitic, nonacid, thermic Vertic Epiaquept.

Table 4. Representative soil features

Parent material	(1) Alluvium – igneous and sedimentary rock
Surface texture	(1) Clay (2) Silty clay
Family particle size	(1) Clayey
Drainage class	Very poorly drained
Permeability class	Very slow
Soil depth	200 cm
Surface fragment cover <=3"	Not specified
Surface fragment cover >3"	Not specified

Available water capacity (0-101.6cm)	10.16 – 12.7 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)	5.6 – 8.4
Subsurface fragment volume <=3" (Depth not specified)	Not specified
Subsurface fragment volume >3" (Depth not specified)	Not specified

Ecological dynamics

The information in this ecological site description (ESD), including the state-and-transition model (STM), was developed using archeological and historical data, professional experience, and scientific studies. The information is representative of a complex set of plant communities. Not all scenarios or plants are included. Key indicator plants, animals, and ecological processes are described to inform land management decisions.

Introduction - This Arkansas River Alluvium (MLRA 131B) is on the alluvial plains along the lower Arkansas River in Arkansas and the Ouachita River in Louisiana and Arkansas. The landforms in the area are level or depressional to very gently undulating alluvial plains, backswamps, oxbows, natural levees, and terraces. Landform shapes range from convex on natural levees and undulating terraces, to concave in oxbows. Landform shapes differentiate water-shedding positions from water-receiving positions, both of which affect soil formation and hydrology. Average elevations start at about 50 feet in the southern part of the area and gradually rise to about 250 feet in the northwestern part. Maximum local relief is about 10 feet, but relief is considerably lower in most of the area.

Geology - Bedrock in this area consists of Tertiary and Cretaceous sands formed as beach deposits during the retreat of the Cretaceous ocean from the midsection of the United States. Alluvial deposits from flooding and lateral migration of the Arkansas and Ouachita Rivers typically lie above the bedrock. These sediments are sandy to clayey fluvial deposits of Holocene to late Pleistocene age and are many feet thick. The geologic surfaces are identified as the Arkansas Lowlands, which extend from the Yazoo Basin up the Arkansas River to the margin of the Coastal Plain, and the parts of the Tensas Basin west of Macon Ridge. The deposits on both of these surfaces are of Holocene age. In some areas late Pleistocene terrace deposits are within several feet of the present surfaces, but they do not crop out in the MLRA.

Biological Resources - This area once consisted entirely of bottomland hardwood deciduous forest and mixed hardwood and cypress swamps pocked with areas of prairies on the terraces. The major tree species in the native plant communities in the areas of bottomland hardwoods formerly were and currently are water oak (*Quercus nigra*), Nuttall oak (*Quercus texana*), cherrybark oak (*Quercus pagoda*), pecan (*Carya illinoensis*), red maple (*Acer rubrum*), sweetgum (*Liquidambar styraciflua*), eastern cottonwood (*Populus deltoides*), and

hickory (*Carya* sp.). The major tree species in the native plant communities in the swamps formerly were and currently are bald cypress (*Taxodium distichum*), water tupelo (*Nyssa aquatica*), green ash (*Fraxinus pennsylvanica*), and black willow (*Salix nigra*). The important native understory species are palmetto (*Sabal minor*), greenbrier (*Smilax* sp.), wild grape (*Vitis* sp.), and poison ivy (*Toxicodendron radicans*) in the areas of bottomland hardwoods and buttonbush (*Cephalanthus occidentalis*), lizardtail (*Saururus cernuus*), waterlily (*Nymphaea* sp.), sedges (*Carex* sp.), and rushes (*Juncus* sp.) in the swamps. Switchgrass (*Panicum virgatum*), big bluestem (*Andropogon gerardii*), little bluestem (*Schizachyrium scoparium*), Indiangrass (*Sorghastrum nutans*), and eastern gamagrass (*Tripsacum dactyloides*) vegetate the prairie terraces.

Land Use - Land use varies throughout the MLRA consisting of 80 percent cropland, 2 percent grassland, 10 percent forest, 6 percent water, and 2 percent other. Wildlife and waterfowl habitat and forested wetlands make up nearly all of this area. Wildlife (Squirrels, Rabbits, Whitetail deer, and Migratory waterfowl are harvested throughout the area. Hardwood timber is harvested on some forested wetlands, and most forested areas are managed for wildlife.

Conservation - The major resource concerns are flood control, water quality, management of soil moisture, and maintenance of the content of organic matter and productivity of the soils. Conservation practices for wildlife and waterfowl habitat generally include creating brush piles for resting/escape cover and den sites for small mammals and birds. Control of invasive species. Leaving varying size snags, dead or partially dead standing trees provide cavities for nesting and resting, perches for hunting and displaying, and an abundant supply of food for insect eaters. Establishing permanent vegetation for wildlife. Provide nesting boxes or other structures where natural nest sites (particularly cavities) are available in low numbers.

State and transition model

Figure 5. STM

Additional community tables

Table 5. Community 1.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production ()	Foliar Cover (%)
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Table 6. Community 2.1 plant community composition

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

This site description was developed as part of the provisional ecological site initiative using historic soil survey manuscripts, available range site descriptions, and low intensity field sampling.

Other references

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Contributors

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Approval

Bryan Christensen, 9/22/2023

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	11/08/2021
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:
