USDA Natural Resources
Conservation Service

Ecological site F115XB041MO
Clayey Floodplain Forest

Last updated: 12/30/2024
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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.

Figure 1. Mapped extent

Areas shown in blue indicate the maximum mapped extent of this ecological site. Other ecological sites likely occur within the highlighted areas. It is also possible for this ecological site to occur outside of highlighted areas if detailed soil survey has not been completed or recently updated.

MLRA notes

Major Land Resource Area (MLRA): 115X–Central Mississippi Valley Wooded Slopes

This MLRA is characterized by deeply dissected, loess-covered hills bordering well defined valleys of the Illinois, Mississippi, Missouri, Ohio, and Wabash Rivers and their tributaries. It is used to produce cash crops and livestock. About one-third of the area is forested, mostly on the steeper slopes. This area is in Illinois (50 percent), Missouri (36 percent), Indiana (13 percent), and Iowa (1 percent) in two separate areas. It makes up about 25,084 square miles (64,967 square kilometers).

Most of this area is in the Till Plains section and the Dissected Till Plains section of the Central Lowland province of the Interior Plains. The Springfield-Salem plateaus section of the Ozarks Plateaus province of the Interior Highlands occurs along the Missouri River and the Mississippi River south of the confluence with the Missouri River. The nearly level to very steep uplands are dissected by both large and small tributaries of the Illinois, Mississippi, Missouri, Ohio, and Wabash Rivers. The Ohio River flows along the southernmost boundary of this area in Indiana. Well defined valleys with broad flood plains and numerous stream terraces are along the major streams and rivers. The flood plains along the smaller streams are narrow. Broad summits are nearly level to undulating. Karst topography is common in some parts along the Missouri and Mississippi Rivers and their tributaries. Well-developed karst areas have hundreds of sinkholes, caves, springs, and losing streams. In the St. Louis area, many of the karst features have been obliterated by urban development.

Elevation ranges from 90 feet (20 meters) on the southernmost flood plains to 1,030 feet (320 meters) on the highest ridges. Local relief is mainly 10 to 50 feet (3 to 15 meters) but can be 50 to 150 feet (15 to 45 meters) in the steep, deeply dissected hills bordering rivers and streams. The bluffs along the major rivers are generally 200 to 350 feet (60 to 105 meters) above the valley floor.

The uplands in this MLRA are covered almost entirely with Peoria Loess. The loess can be more than 7 feet (2 meters) thick on stable summits. On the steeper slopes, it is thin or does not occur. In Illinois, the loess is underlain mostly by Illinoian-age till that commonly contains a paleosol. Pre-Illinoian-age till is in parts of this MLRA in Iowa and Missouri and to a minor extent in the western part of Illinois. Wisconsin-age outwash, alluvial deposits, and sandy eolian material are on some of the stream terraces and on dunes along the major tributaries. The loess and glacial deposits are underlain by several bedrock systems. Pennsylvanian and Mississippian bedrock are the most extensive. To a lesser extent are Silurian, Devonian, Cretaceous, and Ordovician bedrock. Karst areas have formed where limestone is near the surface, mostly in the southern part of the MLRA along the Mississippi River and some of its major tributaries. Bedrock outcrops are common on the bluffs along the Mississippi, Ohio, and Wabash Rivers and their major tributaries and at the base of some steep slopes along minor streams and drainageways.

The annual precipitation ranges from 35 to 49 inches (880 to 1,250 millimeters) with a mean of 41 inches (1,050 millimeters). The annual temperature ranges from 48 to 58 degrees F (8.6 to 14.3 degrees C) with a mean of 54 degrees F (12.3 degrees C). The freeze-free period ranges from 150 to 220 days with a mean of 195 days.

Soils The dominant soil orders are Alfisols and, to a lesser extent, Entisols and Mollisols. The soils in the area have a mesic soil temperature regime, an aquic or udic soil moisture regime, and mixed or smectitic mineralogy. They are shallow to very deep, excessively drained to poorly drained, and loamy, silty, or clayey.

The soils on uplands in this area support natural hardwoods. Oak, hickory, and sugar maple are the dominant species. Big bluestem, little bluestem, and scattered oak and eastern redcedar grow on some sites. The soils on flood plains support mixed forest vegetation, mainly American elm, eastern cottonwood, river birch, green ash, silver maple, sweetgum, American sycamore, pin oak, pecan, and willow. Sedge and grass meadows and scattered trees are on some low-lying sites. (United States Department of Agriculture, Natural Resources Conservation Service, 2022)

LRU notes

The Central Mississippi Valley Wooded Slopes, Western Part consists of deeply dissected, loess-covered hills bordering the Missouri and Mississippi Rivers as well as floodplains and terraces of these rivers. The Northern boundary runs along the South Fabius River valley separating it from the broad rounded interfluves of the northern till plain. A major physiographic feature within the LRU (Land Resource Unit) includes the Lincoln Hills region. The Lincoln Hills extend along the Mississippi River in Missouri, starting about 40 miles (64 kilometers) northwest of St. Louis and extending north to Hannibal. The Lincoln Hills partially escaped the most recent glaciation in the region during the Pleistocene. In geology and biology, they resemble the rugged and forested hills of the Ozark Highlands (MLRA 116A) more than the rolling plains of northern Missouri. The underlying limestone bedrock has formed bluffs, glades, caves, springs, and sinkholes. Elevation ranges from about 420 feet (128 meters) along the Mississippi River near Cape Girardeau, Missouri to about 830 feet (253 meters) near Clarksville along the Mississippi River upstream from St. Louis. High ridges near Hillsboro, Missouri can reach over 1,000 feet (305 meters). Underlying bedrock is mainly Ordovician-aged dolomite and sandstone, with Mississippian-aged limestone north of the Missouri River. Loess caps both stream and glacial outwash terraces along the major rivers along with Pre-Illinoisan till near the edges of the area.

Classification relationships

Major Land Resource Area (MLRA) (USDA-NRCS, 2022):
115X–Central Mississippi Valley Wooded Slopes

Terrestrial Natural Community Type in Missouri (Nelson, 2010):
The reference state for this ecological site is most similar to a Wet Bottomland Forest.

Missouri Department of Conservation Forest and Woodland Communities (MDC, 2006):
The reference state for this ecological site is most similar to a Wet Bottomland Forest.

National Vegetation Classification System Vegetation Association (NatureServe, 2010):
The reference state for this ecological site is most similar to an Acer saccharinum-Ulmus americana-Populus deltoides Forest (CEGL002586).

Geographic relationship to the Missouri Ecological Classification System (Nigh & Schroeder, 2002):
This ecological site occurs throughout the following Subsections:
Missouri River Alluvial Plain
Mississippi River Alluvial Plain

Ecological site concept

Clayey Floodplain Forests are on the Missouri and Mississippi River floodplains, primarily adjacent to the current river channel. Sites are commonly adjacent to the Loamy Floodplain Forest and the Sandy Floodplain Forest ecological sites, and are closely associated with Ponded Floodplain Prairie sites. Soils are very deep and clayey, with seasonal high water tables. The reference plant community is forest dominated by swamp white oak, green

ash, hackberry, eastern cottonwood, shellbark hickory, sycamore, silver maple, and American elm.

Associated sites

R115XB042MO	**Ponded Floodplain Prairie** Ponded Floodplain Prairies are in the lower former channel areas that have high seasonal water tables with some ponding.
F115XB015MO	**Sandy/Loamy Floodplain Forest** Sandy/Loamy Floodplain Forests are commonly adjacent to Clayey Floodplain Forests
F115XB031MO	**Loamy Floodplain Forest** Loamy Floodplain Forests sometimes form a complex with this ecological site.

Similar sites

F115XB025MO	**Wet Terrace Forest** Wet Terrace Forests can have similar species composition but are on higher elevations in the floodplain.

Table 1. Dominant plant species

Tree	(1) *Celtis occidentalis* (2) *Ulmus americana*
Shrub	(1) *Cephalanthus occidentalis*
Herbaceous	(1) *Leersia oryzoides*

Physiographic features

This site is on the Missouri River floodplain, with slopes of less than 2 percent. Most areas are in current or former backswamp positions. Areas not protected by levees are subject to frequent flooding.

The following figure (adapted from Horn, 1992) shows the typical landscape position of this ecological site, and landscape relationships among the major ecological sites of the Missouri River floodplain. This site is within the area labeled as “3” on the figure, and is typically in former backswamp positions of the Missouri and Mississippi rivers. These sites are commonly adjacent to Sandy/Loamy Floodplain sites (labeled “2”), and often contain or are adjacent to Ponded Floodplain Prairie sites (labeled “5”). The dashed lines within the Sandy/Loamy Floodplain Forest area indicate the various soils included in this ecological site.

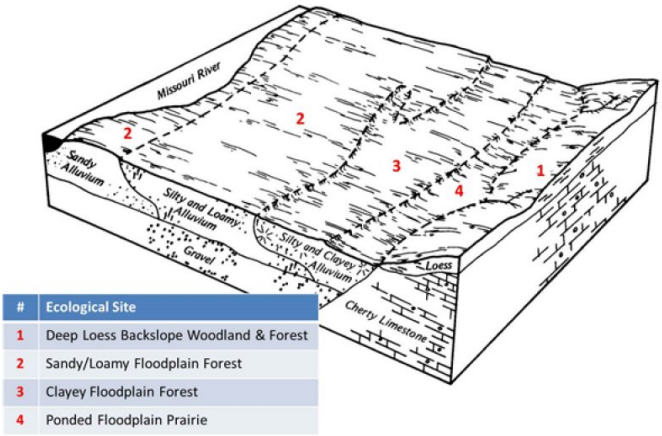


Figure 2. Landscape relationships for this ecological site.

Table 2. Representative physiographic features

Landforms	(1) Flood plain
Runoff class	High to very high

Flooding duration	Brief (2 to 7 days) to long (7 to 30 days)
Flooding frequency	Occasional to frequent
Ponding frequency	None
Elevation	107–274 m
Slope	0–6%
Water table depth	15–51 cm
Aspect	Aspect is not a significant factor

Climatic features

The Central Mississippi Valley Wooded Slopes, Western Part has a continental type of climate marked by strong seasonality. In winter, dry-cold air masses, unchallenged by any topographic barriers, periodically swing south from the northern plains and Canada. If they invade reasonably humid air, snowfall and rainfall result. In summer, moist, warm air masses, equally unchallenged by topographic barriers, swing north from the Gulf of Mexico and can produce abundant amounts of rain, either by fronts or by convectional processes. In some summers, high pressure stagnates over the region, creating extended droughty periods. Spring and fall are transitional seasons when abrupt changes in temperature and precipitation may occur due to successive, fast-moving fronts separating contrasting air masses.

The Central Mississippi Valley Wooded Slopes, Western Part experiences regional differences in climates, but these differences do not have obvious geographic boundaries. Regional climates grade inconspicuously into each other. The basic gradient for most climatic characteristics is along a line diagonally crossing the MLRA from northwest to southeast. Both mean annual temperature and precipitation exhibit gradients along this line.

The average annual precipitation in most of this area is 38 to 48 inches. The average annual temperature is 53 to 57 degrees F. Mean January minimum temperature follows the northwest-to-southeast gradient. However, mean July maximum temperature shows hardly any geographic variation in the MLRA. Mean July maximum temperatures have a range of only two or three degrees across the area.

Mean annual precipitation varies along the same gradient as temperature. Seasonal climatic variations are more complex. Seasonality in precipitation is very pronounced due to strong continental influences. June precipitation, for example, averages three to four times greater than January precipitation. Most of the rainfall occurs as high-intensity, convective thunderstorms in summer. Snowfall is common in winter.

During years when precipitation comes in a fairly normal manner, moisture is stored in the top layers of the soil during the winter and early spring, when evaporation and transpiration are low. During the summer months the loss of water by evaporation and transpiration is high, and if rainfall fails to occur at frequent intervals, drought will result. Drought directly affects plant and animal life by limiting water supplies, especially at times of high temperatures and high evaporation rates.

Superimposed upon the basic MLRA climatic patterns are local topographic influences that create topoclimatic, or microclimatic variations. In regions of appreciable relief, for example, air drainage at nighttime may produce temperatures several degrees lower in valley bottoms than on side slopes. At critical times during the year, this phenomenon may produce later spring or earlier fall freezes in valley bottoms. Higher daytime temperatures of bare rock surfaces and higher reflectivity of these unvegetated surfaces may create distinctive environmental niches such as glades and cliffs. Slope orientation is an important topographic influence on climate. Summits and south-and-west-facing slopes are regularly warmer and drier than adjacent north- and-east-facing slopes. Finally, the climate within a canopied forest is measurably different from the climate of a more open grassland or savanna areas.

Source: University of Missouri Climate Center - http://climate.missouri.edu/climate.php; accessed June 2012

Land Resource Regions and Major Land Resource Areas of the United States, the Caribbean, and the Pacific Basin, United States Department of Agriculture Handbook 296 - http://soils.usda.gov/survey/geography/mlra/

Table 3. Representative climatic features

Frost-free period (characteristic range)	158-187 days
Freeze-free period (characteristic range)	189-203 days
Precipitation total (characteristic range)	1,041-1,168 mm
Frost-free period (actual range)	153-194 days
Freeze-free period (actual range)	188-215 days
Precipitation total (actual range)	1,041-1,219 mm
Frost-free period (average)	171 days
Freeze-free period (average)	197 days
Precipitation total (average)	1,118 mm

Climate stations used

- (1) NEW FRANKLIN 1W [USC00236012], Franklin, MO
- (2) ST CHARLES 7 SSW [USC00237398], Saint Louis, MO
- (3) ALTON MELVIN PRICE L&D [USC00110137], West Alton, IL
- (4) KASKASKIA RVR NAV LOCK [USC00114629], Ellis Grove, IL
- (5) JEFFERSON CITY WTP [USC00234271], Jefferson City, MO
- (6) CAIRO 3N [USW00093809], Barlow, IL
- (7) CAPE GIRARDEAU MUNI AP [USW00003935], Chaffee, MO

Influencing water features

This ecological site is in floodplains of perennial streams, but are not typically adjacent to the current stream channel. They are influenced by a seasonal high water table, due to high groundwater levels in these topographically low positions and flooding. The water table may be near the surface in late fall through spring, receding in the summer.

Stream levels typically respond quickly to storm events, especially in watersheds where surface runoff is dominant. Medium- to long-duration flooding is common in many areas, particularly during spring and early summer storm events. Constructed levees, often accompanied by stream channelization, have altered the hydrology and flooding dynamics in many places and may indicate an altered state.

This site is in the RIVERINE wetlands class of the Hydrogeomorphic (HGM) classification system (Brinson, 1993), and are Forested Palustrine wetlands (Cowardin et al., 1979).

Soil features

These soils are very deep, with seasonal high water tables. They were formed under a mixture of herbaceous wetland and woodland vegetation. Organic matter content is variable. Parent material is alluvium. They have silt loam to silty clay surface horizons, with calcareous clayey subsurface layers. Some have a fine sandy loam or silt loam subsurface. Soil series associated with this site include Bowdre, Blencoe, Darwin, Fults, Gorham, Jacob, Karnak, McFain, Nameoki, Parkville, SansDessein, and Waldron.

The accompanying picture of the Parkville series shows dark silty clay surface horizons, over fine sandy loam and silt loam subsurface horizons below about 30 cm. These contrasting textures are the result of a dramatic change in the depositional history of the site caused by shifts in the course of the Missouri River. This two-tiered depositional pattern is characteristic of several soils in this ecological site. The underlying silt loam has little effect on the native vegetation, which is controlled by the seasonal wetness and clayey surface layers. Photo courtesy of NRCS.

Figure 9. Parkville series

Table 4. Representative soil features

Parent material	(1) Alluvium
Surface texture	(1) Silt loam (2) Silty clay loam (3) Silty clay
Family particle size	(1) Clayey
Drainage class	Poorly drained to somewhat poorly drained
Permeability class	Very slow
Soil depth	183 cm
Surface fragment cover <=3"	0%
Surface fragment cover >3"	0%
Available water capacity (0-101.6cm)	10.16–17.78 cm
Calcium carbonate equivalent (0-101.6cm)	0–10%
Electrical conductivity (0-101.6cm)	0–2 mmhos/cm
Sodium adsorption ratio (0-101.6cm)	0
Soil reaction (1:1 water) (0-101.6cm)	6.6–8.2
Subsurface fragment volume <=3" (Depth not specified)	0%
Subsurface fragment volume >3" (Depth not specified)	0%

Ecological dynamics

Information contained in this section was developed using historical data, professional experience, field reviews, and scientific studies. The information presented is representative of very complex vegetation communities. Key indicator plants, animals and ecological processes are described to help inform land management decisions. Plant communities will differ across the MLRA because of the naturally occurring variability in weather, soils, and aspect. The Reference Plant Community is not necessarily the management goal. The species lists are representative and are not botanical descriptions of all species occurring, or potentially occurring, on this site. They are not intended to cover every situation or the full range of conditions, species, and responses for the site.

Historically, the Missouri and Mississippi rivers were a very dynamic system with frequent flooding and multiple braided channels that shifted back and forth across the floodplain. Gravelly, sandy, loamy, and clayey deposits of sediment sorted themselves out on the floodplain depending on the speed, volume and duration of the waters carrying them. Clayey deposits occurred in areas of slower moving water, such as in isolated, concave meander scars or backwater areas between the natural levees formed nearer the channel. Current management of the river has drastically altered this dynamic process although the clayey soil texture and seasonally high water table still influences the development of these floodplain forest communities.

Clayey Floodplain Forests resemble the adjacent Loamy Floodplain Forests, except that they lack species of oak and black walnut that do not tolerate extended periods of wetness that can occur in these units. In addition, the ground flora is often barren because of inundation and occasional ponding. Historic flooding of Clayey Floodplain Forest sites occurred annually in this region or at least once every 3 years. Flooding would have been a combination of headwater and backwater events, with periods of slower moving water distinguishing it from adjacent forest types. Succession in Clayey Floodplain Forests appears to be similar to that of the Loamy Floodplain Forests, except that periods of inundation and ponding exclude many later successional hardwood species. Hackberry, elm, ash, eastern cottonwood and sycamore form a tall canopy (80 to 100 feet) that is uneven and has frequent canopy holes. Catastrophic floods will often partially or completely knock down trees. Consequently, this ecological site is often made up of a mosaic of early to late successional floodplain forests.

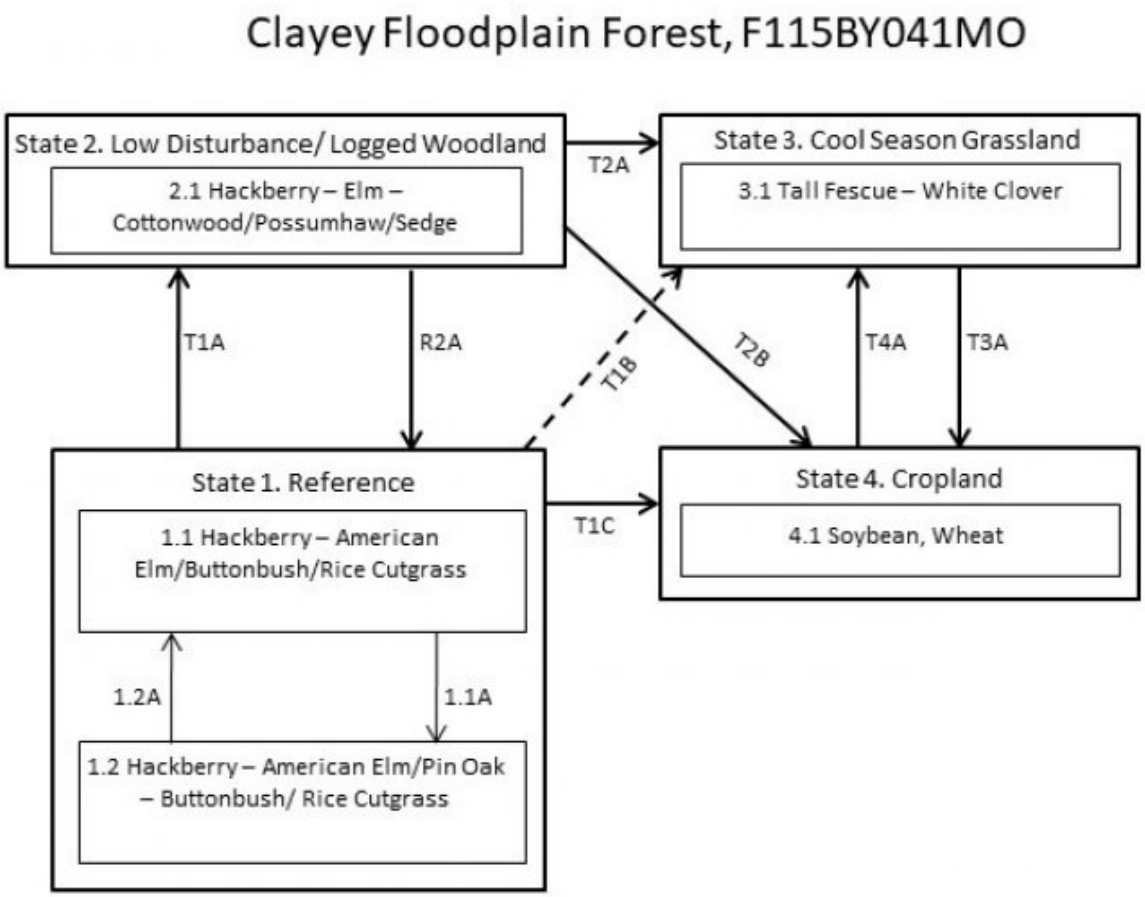
Today most of these ecological sites have been cleared and converted to agriculture. While some cleared fields have retained a narrow strip of forest along the stream, many of these ecological sites are often cleared right up to the bank. In such cases, severe flooding may cause stream bank erosion and complete loss of this ecological site. Uncontrolled grazing by domestic livestock in the remaining strips of forest can also kill trees and remove the ground cover, resulting in de-stabilization and degradation of this ecological site as well.

The remaining remnants that still exist along un-leveed areas, within levees and on islands play an important role as a source of food and shelter for migrating birds. In addition, large floodplain trees that extend above the canopy are important nesting sites for bald eagles and herons. Carefully planned timber harvests can be tolerated in this system, but high grading of the timber will eventually degrade the ecological site.

Re-establishment of these riparian forests is important for stream quality and health, as well as for migratory birds. Planting of appropriate species has proven to be quite successful.

A State and Transition Diagram follows. Detailed descriptions of each state, transition, plant community, and pathway follow the model. This model is based on available experimental research, field observations, professional consensus, and interpretations. It is likely to change as knowledge increases.

State and transition model



Code	Event/Activity/Process
T1A	Lack of natural disturbance events > 20 years; repeated timber harvests
T3A	Tillage; conservation cropping system
T1B,T2A	Woody removal; tillage; vegetative seeding; grassland management
T1C, T2B	Woody removal; tillage; conservation cropping system
T4A	Vegetative seeding ; grassland management
1.1A	Lack of natural disturbance events 10+ years
1.2A	Natural disturbance events 2-5 years
R2A	Forest stand improvement; extended rotations

Figure 10. State and transition diagram for this ecological site

State 1

Reference

The historical reference state for this ecological site was old growth riverine forest. The forest was dominated by hackberry, cottonwood and elm. Periodic disturbances from flooding, wind or ice as well as grazing by native large herbivores maintained the open, uneven structure and diverse ground flora species. Long disturbance-free periods allowed an increase in both the density of trees and the abundance of shade tolerant species. Two community phases are recognized in the reference state, with shifts between phases based on disturbance frequency.

Dominant plant species

- common hackberry (*Celtis occidentalis*), tree
- slippery elm (*Ulmus rubra*), tree
- pin oak (*Quercus palustris*), tree
- common buttonbush (*Cephalanthus occidentalis*), shrub
- rice cutgrass (*Leersia oryzoides*), grass

Community 1.1
Hackberry – American Elm/Buttonbush/Ricecut grass

This community phase contains old growth hackberry, elm, ash, cottonwood and sycamore that form a tall canopy (80 to 100 feet) that is uneven and has frequent canopy holes. Catastrophic floods will often partially or completely knock down trees.

Forest overstory. Forest Overstory Composition species list based on Nelson (2010) and field surveys.

Forest understory. Forest Understory Composition species list based on Nelson (2010) and field surveys.

Community 1.2
Hackberry – American Elm/Pin Oak – Buttonbush/Ricecut grass

This phase is similar to phase 1.1. With lower flooding disturbance frequencies, a mid-story layer of pin oak and shellbark hickory quickly develops.

Pathway P1.1A
Community 1.1 to 1.2

This pathway is the result of lack of natural disturbance events occurring.

Pathway P1.2A
Community 1.2 to 1.1

This pathway is the result of natural disturbance events at least every 2 to 5 years.

State 2
Low Disturbance/ Logged Forest

Composition is altered from the reference state depending on tree selection during harvest. This state will slowly increase in more shade tolerant species and swamp white oak and bur oak will become less dominant. Without periodic canopy disturbance, stem density and fire intolerant species, like hackberry, will increase in abundance. Some periodic grazing may be occurring.

Dominant plant species

- common hackberry (*Celtis occidentalis*), tree
- slippery elm (*Ulmus rubra*), tree
- eastern cottonwood (*Populus deltoides*), tree
- possumhaw (*Ilex decidua*), shrub
- sedge (*Carex*), grass

Community 2.1
Hackberry – Elm – Cottonwood/Possumhaw/Sedge

This is the only phase associated with this state at this time. See the corresponding state narrative for details.

State 3
Cool Season Grassland

Conversion of other states to non-native cool season species such as tall fescue, orchard grass, and white clover has been common. Occasionally, these pastures will have scattered oaks. Long term uncontrolled grazing can cause significant soil erosion and compaction.

Dominant plant species

- tall fescue (*Schedonorus arundinaceus*), grass
- white clover (*Trifolium repens*), other herbaceous

Community 3.1
Tall Fescue – White Clover

This is the only phase associated with this state at this time. See the corresponding state narrative for details.

State 4
Cropland

This is a state that exists currently with intensive cropping of soybeans and wheat. Some conversion to cool season hay land occurs, but when commodity prices are high, these states transition back to cropland.

Dominant plant species

- wheat (*Triticum*), grass
- soybean (*Glycine*), other herbaceous

Community 4.1
Soybean, Wheat

This is the only phase associated with this state at this time. See the corresponding state narrative for details.

Transition T1A
State 1 to 2

This transition is the result of lack of natural disturbance events for grater than 20 years and repeated timber harvests.

Transition T1B
State 1 to 3

This transition is the result of woody removal, tillage, vegetative seeding and grassland management.

Transition T1C
State 1 to 4

This transition is the result of woody removal, tillage, and conservation cropping system.

Restoration pathway R2A
State 2 to 1

This restoration pathway is the result of forest stand improvement and extended rotations.

Transition T2A
State 2 to 3

This transition is the result of of woody removal, tillage, vegetative seeding and grassland management.

Transition T2B
State 2 to 4

This transition is the result of woody removal, tillage, and conservation cropping system.

Transition T3A
State 3 to 4

This transition is the result tillage and conservation cropping system.

Transition T4A
State 4 to 3

This transition is the result of vegetative seeding and grassland management.

Additional community tables

Table 5. Community 1.1 forest overstory composition

Common Name	Symbol	Scientific Name	Nativity	Height (M)	Canopy Cover (%)	Diameter (Cm)	Basal Area (Square M/Hectare)
Tree							
sugarberry	CELA	*Celtis laevigata*	Native	–	–	–	–
green ash	FRPE	*Fraxinus pennsylvanica*	Native	–	–	–	–
swamp white oak	QUBI	*Quercus bicolor*	Native	–	–	–	–
pin oak	QUPA2	*Quercus palustris*	Native	–	–	–	–
slippery elm	ULRU	*Ulmus rubra*	Native	–	–	–	–
eastern cottonwood	PODE3	*Populus deltoides*	Native	–	–	–	–
common hackberry	CEOC	*Celtis occidentalis*	Native	–	–	–	–
silver maple	ACSA2	*Acer saccharinum*	Native	–	–	–	–
American sycamore	PLOC	*Platanus occidentalis*	Native	–	–	–	–
pecan	CAIL2	*Carya illinoinensis*	Native	–	–	–	–
shellbark hickory	CALA21	*Carya laciniosa*	Native	–	–	–	–

Table 6. Community 1.1 forest understory composition

Common Name	Symbol	Scientific Name	Nativity	Height (M)	Canopy Cover (%)
Grass/grass-like (Graminoids)					
Indian woodoats	CHLA5	*Chasmanthium latifolium*	Native	–	–
hop sedge	CALU4	*Carex lupulina*	Native	–	–
squarrose sedge	CASQ2	*Carex squarrosa*	Native	–	–
sweet woodreed	CIAR2	*Cinna arundinacea*	Native	–	–
fowl mannagrass	GLST	*Glyceria striata*	Native	–	–
	CAVU7	*Carex vulpina*	Native	–	–
rice cutgrass	LEOR	*Leersia oryzoides*	Native	–	–
Forb/Herb					
Canadian woodnettle	LACA3	*Laportea canadensis*	Native	–	–
smallspike false nettle	BOCY	*Boehmeria cylindrica*	Native	–	–
eastern waterleaf	HYVI	*Hydrophyllum virginianum*	Native	–	–
wingstem	VEAL	*Verbesina alternifolia*	Native	–	–
cutleaf coneflower	RULA3	*Rudbeckia laciniata*	Native	–	–
jewelweed	IMCA	*Impatiens capensis*	Native	–	–
pale touch-me-not	IMPA	*Impatiens pallida*	Native	–	–
foxglove beardtongue	PEDI	*Penstemon digitalis*	Native	–	–
Canadian clearweed	PIPU2	*Pilea pumila*	Native	–	–
bristly buttercup	RAHI	*Ranunculus hispidus*	Native	–	–
giant goldenrod	SOGI	*Solidago gigantea*	Native	–	–
Shrub/Subshrub					
common buttonbush	CEOC2	*Cephalanthus occidentalis*	Native	–	–
silky dogwood	COOB9	*Cornus obliqua*	Native	–	–
Tree					
boxelder	ACNE2	*Acer negundo*	Native	–	–
black willow	SANI	*Salix nigra*	Native	–	–
Vine/Liana					
heartleaf peppervine	AMCO2	*Ampelopsis cordata*	Native	–	–
trumpet creeper	CARA2	*Campsis radicans*	Native	–	–
frost grape	VIVU	*Vitis vulpina*	Native	–	–
eastern poison ivy	TORA2	*Toxicodendron radicans*	Native	–	–

Animal community

Wildlife (MDC 2006):

This ecological site is a dense, muti-layered forest, with snags and cavities and down dead wood that provides habitat for many species requiring cool, rich, moist conditions.

Bird species associated with these mature forests include Great Blue Heron (colonies especially in large sycamores and cottonwoods), Bald Eagle, Belted Kingfisher, Red-shouldered Hawk, Northern Parula, Louisiana Waterthrush, Wood Duck, Hooded Merganser, Kentucky Warbler, Hooded Warbler, Acadian Flycatcher, Barred Owl, Pileated Woodpecker, Cerulean Warbler, and Yellow-throated Warbler.

Reptiles and amphibians associated with this ecological site include small-mouthed salamander, central newt, midland brown snake, and gray tree frog.

Other information

Forestry (NRCS 2002, 2014):

Management: Field measured site index values range from 78 for silver maple, 71 for pecan and 106 for cottonwood. Timber management opportunities are good. Create group openings of at least 2 acres. Large clearcuts should be minimized if possible to reduce impacts on wildlife and aesthetics. Uneven-aged management using single tree selection or small group selection cuttings of ½ to 1 acre are other options that can be used if clear cutting is not desired or warranted. Harvest methods that leave some mature trees to provide shade and soil protection may be desirable. Maintain adequate riparian buffer areas.

Limitations: Wetness from flooding – short to long duration and/or high water table; Use of equipment may be restricted in spring and other excessively wet periods. Equipment use when wet may compact soil and damage tree roots. Tree planting is difficult during spring flooding periods. Seedling mortality may be high due to excess wetness. Ridging the soil and planting on the ridges may increase survival. Clayey soils have reduced traction and compact easily when wet. Unsurfaced roads and skid trails may be impassable during rainy periods. Restrict activities to dry periods or surfaced areas. The surface layer is firm when dry and sticky when wet and becomes cloddy if tilled. Seedling mortality may occur during the summer because of lack of adequate soil moisture.

Inventory data references

Potential Reference Sites: Clayey Floodplain Forest

Plot ARROSHS01 – SanDessein soil
Located in Arrow Rock State Historic Site, Saline County, MO
Latitude: 39.066786
Longitude: -92.939947

Plot VOESL001 - SansDessein soil
Located in Voelkerding Slough, East Central Junior College, Warren County, MO
Latitude: 38.609679
Longitude: -91.019261

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Contributors

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Approval

Suzanne Mayne-Kinney, 12/30/2024

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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	05/14/2025
Approved by	Suzanne Mayne-Kinney
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:**
