Ecological site F115XB023MO
Wet Footslope Forest

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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-Mesic 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 a uercus macrocarpa – Quercus shumardii – Carya cordiformis / Chasmanthium latifolium Forest (CEGL004544).

Geographic relationship to the Missouri Ecological Classification System (Nigh & Schroeder, 2002):
This ecological site occurs in several of the westernmost Land Type Associations of the following Subsections:
Inner Ozark Border
Outer Ozark Border

Ecological site concept

Wet Footslope Forests are mainly in the western part of the MLRA south of the Missouri River, although a few scattered areas are in the southern part in the Missouri River watershed. Soils are very deep, with silt loam surface horizons, loamy to clayey subsoils and seasonal high water tables. The reference plant community is forest with an overstory dominated by a variety of trees including bur oak, Shumard oak, swamp white oak, American elm, and

black cherry, an understory dominated by American hornbeam, Northern spicebush, and Ohio buckeye, and a rich herbaceous ground flora.

Associated sites

F115XB004MO	**Loess Upland Woodland** Loess Upland Woodlands, and other upland and backslope ecological sites, are upslope.
F115XB024MO	**Loamy Terrace Forest** Loamy Terrace Forests are adjacent and downslope.
F115XB025MO	**Wet Terrace Forest** Wet Terrace Forests are generally adjacent and downslope.
F115XB031MO	**Loamy Floodplain Forest** Loamy Floodplain Forests are downslope in the main floodplain.

Similar sites

F115XB025MO	**Wet Terrace Forest** Wet Terrace Forests are generally adjacent and downslope.

Table 1. Dominant plant species

Tree	(1) *Quercus macrocarpa* (2) *Quercus shumardii*
Shrub	(1) *Ilex decidua*
Herbaceous	(1) *Chasmanthium latifolium*

Physiographic features

This site is on footslopes, with slopes of 2 to 9 percent. The site receives runoff from adjacent upland sites. This site does not flood.

The following figure portrays a probable landscape position of this ecological site, and landscape relationships among the major ecological sites in the uplands. The site is within the area labeled “3”, on footslopes. Loess Upland Woodland and Forest sites, on upland hillslope shoulders and upper backslopes are included in the area. Gravelly/Loamy Upland Drainageway Forest sites are occasionally downslope.

Figure 2. Landscape relationships

Table 2. Representative physiographic features

Landforms	(1) Hill
Flooding frequency	None

Ponding frequency	None
Slope	1–9%
Water table depth	6–12 in
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)	165-169 days

Freeze-free period (characteristic range)	191-196 days
Precipitation total (characteristic range)	42-43 in
Frost-free period (actual range)	164-170 days
Freeze-free period (actual range)	189-197 days
Precipitation total (actual range)	42-44 in
Frost-free period (average)	167 days
Freeze-free period (average)	193 days
Precipitation total (average)	43 in

Climate stations used

- (1) CALIFORNIA [USC00231189], California, MO
- (2) MARSHALL [USW00013991], Marshall, MO
- (3) NEW FRANKLIN 1W [USC00236012], Franklin, MO
- (4) JEFFERSON CITY WTP [USC00234271], Jefferson City, MO

Influencing water features

This ecological site is influenced by a seasonal high water table from high groundwater levels, as well as slow hydraulic conductivity, which impedes throughflow from precipitation and flood events. The water table is typically near the surface in late fall through spring, receding in the summer.

This ecological site is on footslopes of perennial streams. They are not adjacent to the current stream channel. Areas on stream terraces are subject to flooding, typically of short duration and low intensity. Constructed levees, often accompanied by stream channelization, have altered the flooding dynamics in many places may indicate an altered state.

Footslopes not subject to flooding, are in the SLOPE wetlands of the Hydrogeomorphic (HGM) classification system class (Brinson, 1993). SLOPE wetlands are found in stream headwaters, slope toes, or at outcrops of low conductivity soil or rock layers. In a stream network, they are found on stream corridor reaches upstream of higher order RIVERINE reaches. Water is forced to the surface by a break in land slope, or when it encounters an aquaclude that moves it to an outcrop. These topographic conditions are common at the boundary between floodplains and adjoining uplands where groundwater is forced to the surface by a rapid change in slope.

Soil features

These soils have no rooting restriction. The soils were formed under forest vegetation, and have thin, light-colored surface horizons. Parent material is colluvium. They have silt loam surface horizons, and clayey subsoils. They are affected by a seasonal high water table during the spring months. Soil series associated with this site include McGirk.

Table 4. Representative soil features

Parent material	(1) Colluvium
Surface texture	(1) Silt loam
Family particle size	(1) Clayey
Drainage class	Poorly drained
Permeability class	Very slow
Soil depth	80 in
Surface fragment cover <=3"	0%

Surface fragment cover >3"	0%
Available water capacity (0-40in)	5–6 in
Calcium carbonate equivalent (0-40in)	0%
Electrical conductivity (0-40in)	0–2 mmhos/cm
Sodium adsorption ratio (0-40in)	0
Soil reaction (1:1 water) (0-40in)	4.5–6
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.

Wet Footslope Forests in the Ozark Border are on lower slope colluvium positions. The historic reference plant community is dominated by a wide variety of deciduous hardwood tree species, tolerant of seasonally wet conditions including bur oak, Shumard oak, swamp white oak, American elm, black cherry. Trees are generally large and tall forming a dense, closed canopy. These forests are structurally and compositionally diverse, with occasional tree-fall gaps and natural mortality providing opportunities for regeneration of overstory species. The understory is also complex, with multiple layers of shade tolerant species such as American hornbeam, Northern spicebush, and Ohio buckeye. Grape vines, greenbriar, and trumpet creeper are also present along with a diverse array of ground flora species that carpets the forest floor.

In this region of historic fire-prone savannas and woodlands, Wet Footslope Forests occur in the most protected landscape positions on lower, concave slopes distant from the fire prone uplands. While the upland woodlands had an estimated fire frequency of 3 to 5 years, these sites burned much less frequently (estimated 10 to 25 years) and with lower intensity. Wet Footslope Forests are also subject to occasional disturbances from wind and ice, which periodically open the canopy up by knocking over trees or breaking substantial branches of canopy trees. Such canopy disturbances allow more light to reach the ground and favor reproduction of the dominant oak species.

Today, these communities have been cleared and converted to pasture, or have undergone repeated timber harvest and domestic grazing. Most existing occurrences have a younger (50 to 80 years) canopy layer whose composition may have been altered by timber harvesting practices. An increase in hickories over historic conditions is common.

Uncontrolled domestic grazing has also diminished the diversity and cover of woodland ground flora species, and has often introduced weedy species such as gooseberry, coralberry, poison ivy and Virginia creeper. Grazed sites also have a more open understory. In addition, soil compaction and erosion related to grazing can lower site productivity.

Wet Footslope Forests are productive timber sites. Timber harvest in this region typically is done using single-tree selection, and often results in removal of the most productive trees, or high-grading of the stand. This can result in poorer quality timber and a shift in species composition away from more valuable oak species. Carefully planned single tree selection or the creation of group openings can help regenerate more desirable oak species and increase vigor on the residual trees. Clear-cutting does occur and results in dense, even-aged stands of primarily

oak. This may be most beneficial for existing stands whose composition has been highly altered by past management practices. However, without some thinning of the dense stands, the ground flora diversity can be shaded out and productivity of the stand may suffer.

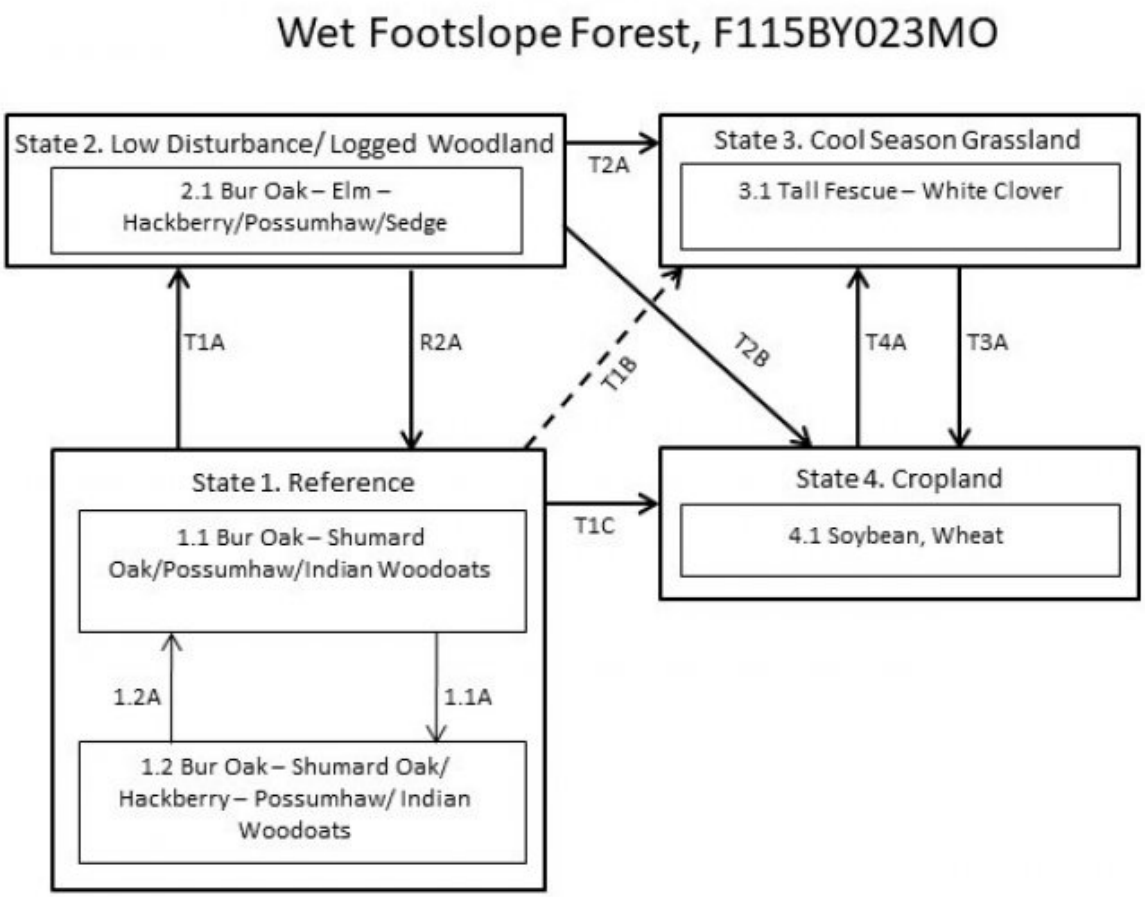
Prescribed fire can play a beneficial but limited role in the management of this ecological site. The higher productivity of these sites makes it more challenging than on other forest and woodland sites in the region. Control of woody species will be more difficult. Footslope forests did evolve with some fire, but their composition often reflects more closed, forested conditions, with fewer woodland ground flora species that can respond to fire. Consequently, while having these sites in a burn unit is acceptable, targeting them solely for woodland restoration is not advisable.

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.

Ecological Site Correlation Issues and Questions:

There is uncertainty with selected footslope and high terrace sites. High quality Loess High Terrace Forest (F115BY022MO) and Wet Footslope Forest (F115BY023MO) reference ecological sites are absent from the current landscape. Conceptually they appear to be distinct ecological sites due to potential drainage and permeability issues.

State and transition model



Code	Event/Activity/Process
T1A	Lack of disturbance events > 20 years; repeated timber harvests
T3A	Tillage; conservation cropping system; water management
T1B,T2A	Woody removal; tillage; vegetative seeding; grassland management
T1C, T2B	Woody removal; tillage; conservation cropping system; water management
T4A	Vegetative seeding; grassland management
1.1A	Lack of disturbance events 15+ years
1.2A	Disturbance events 15-20 years
R2A	Forest stand improvement; extended rotations

Figure 9. State and transition diagram for this ecological site

State 1

Reference

The historical reference state for this ecological site was old growth oak forest. The forest was dominated by Shumard oak and bur oak. Maximum tree age was likely 150 to 300 years. Periodic disturbances from flooding, fire, wind or ice as well as grazing by native large herbivores maintained the woodland 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

- bur oak (*Quercus macrocarpa*), tree
- Shumard's oak (*Quercus shumardii*), tree
- common hackberry (*Celtis occidentalis*), tree
- possumhaw (*Ilex decidua*), shrub
- Indian woodoats (*Chasmanthium latifolium*), grass

Community 1.1
Bur Oak – Shumard Oak/Possumhaw/Indian Woodoats

This phase burns an estimated every 10-25 years and is also subject to occasional disturbances from wind and ice, which periodically open the canopy up by knocking over trees or breaking substantial branches of canopy trees. Such canopy disturbances allow more light to reach the ground and favor reproduction of the dominant oak species.

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

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

Community 1.2
Bur Oak – Shumard Oak/ Hackberry – Possumhaw/ Indian Woodoats

Long disturbance-free periods in this community phase allowed an increase in more shade tolerant species such as hackberry and elm with increased canopy density, which has affected the abundance and diversity of ground flora.

Pathway P1.1A
Community 1.1 to 1.2

This pathway is the result of lack of disturbance events for more than15 years.

Pathway P1.2A
Community 1.2 to 1.1

This pathway is the result of reoccurring disturbance events every 15 to 20 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

- bur oak (*Quercus macrocarpa*), tree
- slippery elm (*Ulmus rubra*), tree
- common hackberry (*Celtis occidentalis*), tree
- possumhaw (*Ilex decidua*), shrub
- sedge (*Carex*), other herbaceous

Community 2.1
Bur Oak – Elm – Hackberry/Possumhaw/Sedge

This is the only phase in 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. A return to the reference state may be impossible, requiring a very long term series of management options and transitions.

Dominant plant species

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

Community 3.1
Tall Fescue – White Clover

This phase is well managed grassland, composed of non-native cool season grasses and legumes. Grazing and haying is occurring. The effects of long-term liming on soil pH, and calcium and magnesium content, is most evident in this phase. Studies show that these soils have higher pH and higher base status in soil horizons as much as two feet below the surface, relative to poorly managed grassland and to woodland communities (where liming is not practiced).

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 in 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 disturbance events greater 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, conservation cropping system and water management.

Restoration pathway R2A
State 2 to 1

Restoration activities include forest stand improvement and extended rotations.

Transition T2A
State 2 to 3

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

Transition T2B
State 2 to 4

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

Transition T3A
State 3 to 4

This transition is the result of 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 (Ft)	Canopy Cover (%)	Diameter (In)	Basal Area (Square Ft/Acre)
Tree							
bur oak	QUMA2	*Quercus macrocarpa*	Native	–	–	–	–
Shumard's oak	QUSH	*Quercus shumardii*	Native	–	–	–	–
bitternut hickory	CACO15	*Carya cordiformis*	Native	–	–	–	–
pecan	CAIL2	*Carya illinoinensis*	Native	–	–	–	–
American sycamore	PLOC	*Platanus occidentalis*	Native	–	–	–	–
shellbark hickory	CALA21	*Carya laciniosa*	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	–	–	–	–
common hackberry	CEOC	*Celtis occidentalis*	Native	–	–	–	–

Table 6. Community 1.1 forest understory composition

Common Name	Symbol	Scientific Name	Nativity	Height (Ft)	Canopy Cover (%)
Grass/grass-like (Graminoids)					
Indian woodoats	CHLA5	*Chasmanthium latifolium*	Native	–	–
hop sedge	CALU4	*Carex lupulina*	Native	–	–
Muskingum sedge	CAMU9	*Carex muskingumensis*	Native	–	–
sweet woodreed	CIAR2	*Cinna arundinacea*	Native	–	–
Forb/Herb					
smallspike false nettle	BOCY	*Boehmeria cylindrica*	Native	–	–
jewelweed	IMCA	*Impatiens capensis*	Native	–	–
veiny skullcap	SCNE2	*Scutellaria nervosa*	Native	–	–
bristly buttercup	RAHI	*Ranunculus hispidus*	Native	–	–
wingstem	VEAL	*Verbesina alternifolia*	Native	–	–
cutleaf coneflower	RULA3	*Rudbeckia laciniata*	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	–	–
limestone wild petunia	RUST2	*Ruellia strepens*	Native	–	–
calico aster	SYLAA	*Symphyotrichum lateriflorum var. angustifolium*	Native	–	–
Shrub/Subshrub					
possumhaw	ILDE	*Ilex decidua*	Native	–	–
northern spicebush	LIBE3	*Lindera benzoin*	Native	–	–
Tree					
American hornbeam	CACA18	*Carpinus caroliniana*	Native	–	–
Ohio buckeye	AEGL	*Aesculus glabra*	Native	–	–
Vine/Liana					
heartleaf peppervine	AMCO2	*Ampelopsis cordata*	Native	–	–
catbird grape	VIPA7	*Vitis palmata*	Native	–	–
riverbank grape	VIRI	*Vitis riparia*	Native	–	–

Animal community

Wildlife (MDC 2006):

Moist conditions with abundant coarse woody debris make this type of ecological site important for many herptiles. Ephemeral pools provide important amphibian breeding habitat.

Acorns provide important habitat and food for migrating ducks (especially mallards) and breeding ducks including wood ducks and hooded mergansers.

Tall emergent trees along with an uneven canopy structure and canopy gaps are important for heron colonies, eagle nesting, Mississippi kites, cerulean warblers and other bird species.

Birds associated with late-successional to mature forests are Wood Duck, Hooded Merganser, Barred Owl, Cerulean Warbler, Yellow-throated Warbler, Prothonotary Warbler, Pileated Woodpecker, Yellow-throated Vireo, Brown Creeper, and Yellow-crowned Night Heron.

Reptiles and amphibians associated with ecological site include: small-mouthed salamander, central newt, midland

brown snake, gray treefrog, northern spring peeper, Blanchard’s cricket frog, southern leopard frog, western painted turtle, and red-eared slider.

Other information

Forestry (NRCS 2002, 2014):

Management: Field measured site index values average 52 for white oak. On the wettest sites, timber management opportunities may be limited. Management of these groups is often difficult because of the great variation in species, age, stocking levels and seasonal wetness. Use seed-tree, group selection, or clear cutting regeneration methods.

Limitations: Seasonal high water table. Use of equipment may be restricted in spring and other excessively wet periods. Restrict activities to dry periods or surfaced areas. Equipment use when wet may compact soil and damage tree roots. Unsurfaced roads and traffic areas tend to be slippery and form ruts easily. Access to forests is easiest during periods in late summer or winter when soils are frozen or dry. Planting is extremely difficult during spring periods. Seedling mortality may be high due to excess wetness. Unsurfaced roads and skid trails may be impassable during rainy periods.

Inventory data references

Potential Reference Sites: Wet Footslope Forest

This ecological site is probably EXTINCT. No known reference sites are known to exist.

Other references

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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	05/10/2025
Approved by	Suzanne Mayne-Kinney
Approval date	
Composition (Indicators 10 and 12) based on	Annual Production

Indicators

1. **Number and extent of rills:**

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2. **Presence of water flow patterns:**

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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):**

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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:**
