USDA Natural Resources Conservation Service

Ecological site F115XB026MO
Wet Upland Drainageway Forest

Last updated: 12/30/2024
Accessed: 03/13/2025

General information

Provisional. A provisional ecological site description has undergone quality control and quality assurance review. It contains a working state and transition model and enough information to identify the ecological site.

MLRA notes

Major Land Resource Area (MLRA): 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 Quercus macrocarpa – Quercus shumardii – Carya cordiformis / Chasmanthium latifolium Forest (CEGL004544).

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

Ecological site concept

Wet Upland Drainageway Forests are scattered in small delineations throughout the upland portions of the MLRA and in adjacent areas. They are associated with Loamy Floodplain Forest sites downstream, and with adjacent upland ecological sites. Soils are loamy to clayey and wet, and are subject to flooding. The reference plant community is forest with an overstory dominated by a wide 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

F115XB005MO	**Loamy Upland Woodland** Loamy Upland Woodland are often upslope from ecological sites formed at least partially in loess.

Similar sites

F115XB025MO	**Wet Terrace Forest** Wet Terrace Forests have similar species composition but are on lower landscape positions.

Table 1. Dominant plant species

Tree	(1) *Quercus palustris* (2) *Quercus macrocarpa*
Shrub	(1) *Vitis*
Herbaceous	(1) *Impatiens capensis* (2) *Carex*

Physiographic features

This site is in narrow drainageways in the uplands, with slopes of 0 to 5 percent. The site receives runoff from adjacent upland sites. Most areas are subject to frequent, brief flooding.

The following figure (adapted from Davis, 2004) shows the typical landscape position of this ecological site, and landscape relationships among the adjacent ecological sites in the uplands. The site is within the area labeled “3”, and is often downslope from ecological sites formed at least partially in loess.

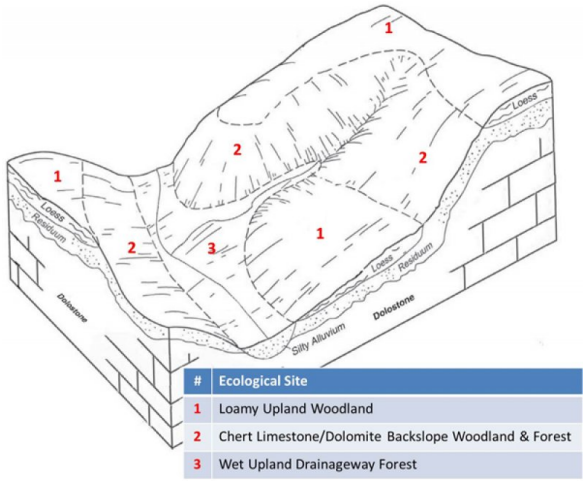


Figure 1. Landscape relationships for this ecological site.

Table 2. Representative physiographic features

Landforms	(1) Drainageway
Runoff class	Very high
Flooding duration	Brief (2 to 7 days)
Flooding frequency	Rare
Ponding frequency	None
Elevation	560–920 ft
Slope	0–5%
Water table depth	12–30 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)	156-165 days
Freeze-free period (characteristic range)	175-191 days
Precipitation total (characteristic range)	42-44 in
Frost-free period (actual range)	151-166 days
Freeze-free period (actual range)	168-192 days
Precipitation total (actual range)	42-44 in

Frost-free period (average)	160 days
Freeze-free period (average)	182 days
Precipitation total (average)	43 in

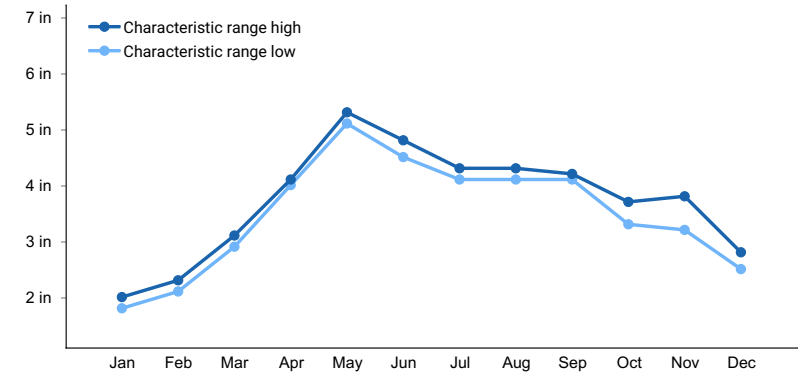


Figure 2. Monthly precipitation range

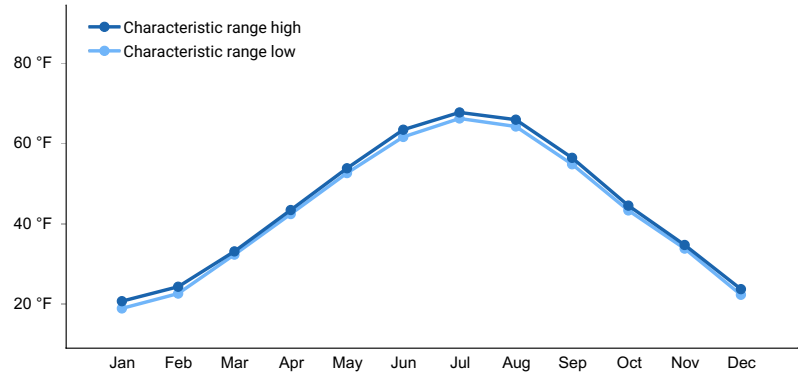


Figure 3. Monthly minimum temperature range

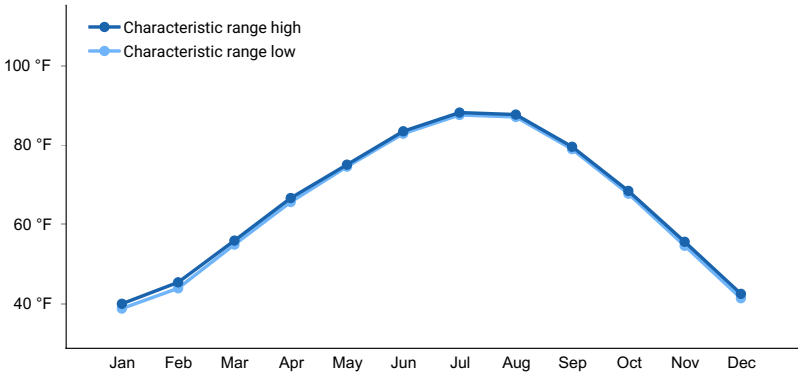


Figure 4. Monthly maximum temperature range

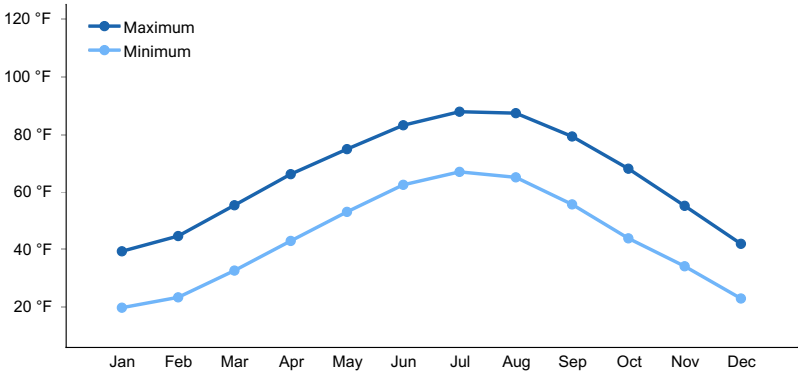


Figure 5. Monthly average minimum and maximum temperature

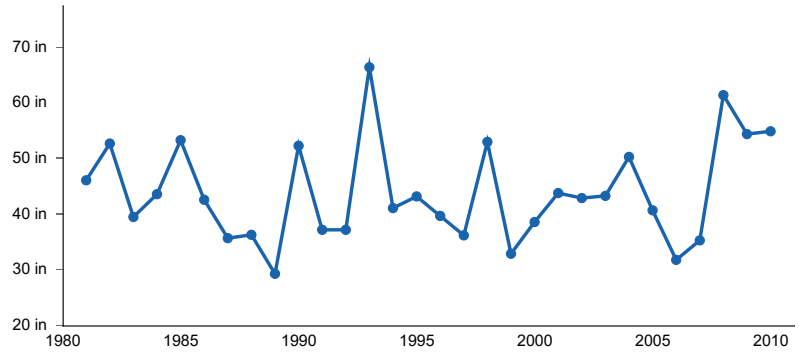


Figure 6. Annual precipitation pattern

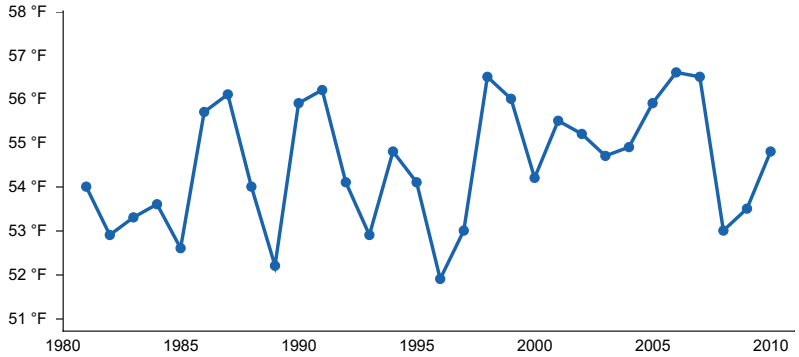


Figure 7. Annual average temperature pattern

Climate stations used

- (1) JEFFERSON CITY WTP [USC00234271], Jefferson City, MO
- (2) NEW FRANKLIN 1W [USC00236012], Franklin, MO
- (3) FREEDOM [USC00233043], Linn, MO

Influencing water features

This ecological site is influenced by a seasonal high water table, which is typically near the surface in late fall through spring, receding in the summer and contains first- and second-order streams, which originate from headslope positions at the upper reaches of the units, and are fed from smaller headslopes in the adjacent uplands. These streams are ephemeral in most years, with flow in the late fall, winter, and spring months, generally disappearing in the summer, or reduced to isolated pools in the lower reaches. Stream levels typically respond quickly to storm events, especially in watersheds where surface runoff is dominant. Short-duration flooding is common in many areas.

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

Soil features

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

Table 4. Representative soil features

Parent material	(1) Alluvium

Surface texture	(1) Silt loam
Family particle size	(1) Loamy
Drainage class	Poorly drained to somewhat poorly drained
Permeability class	Slow to moderately slow
Soil depth	80 in
Surface fragment cover <=3"	0%
Surface fragment cover >3"	0%
Available water capacity (0-40in)	8–9 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)	5.1–7.3
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.

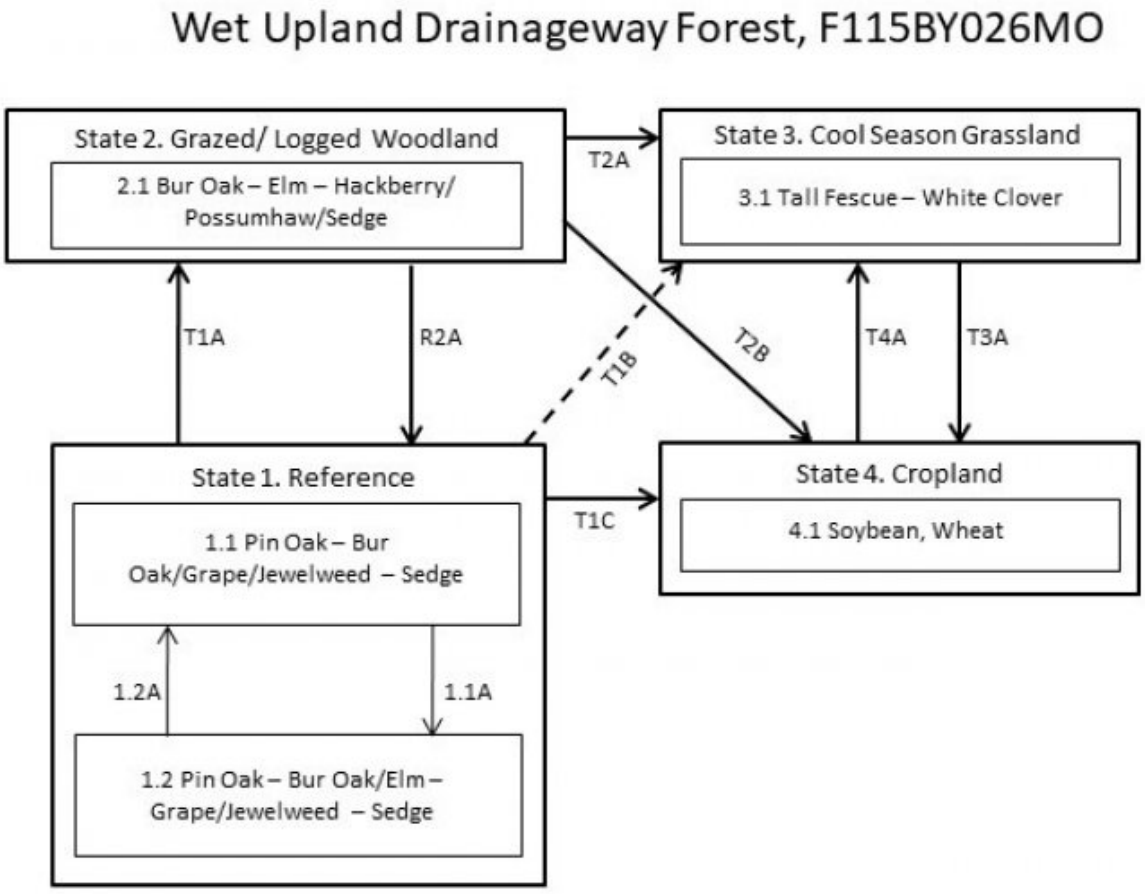
Wet Upland Drainageway Forests have loamy to clayey soil textures and are seasonally wet, limiting the density of trees, creating a more open forest structure. Historically, these forests were dominated by a wide variety of deciduous hardwood tree species, tolerant of seasonally wet conditions. These included pin oak, bur oak, shellbark hickory, swamp white oak, Shumard oak, and American elm. Both historically and today, these forests are structurally and compositionally diverse, with occasional tree fall gaps and natural mortality providing opportunities for regeneration of overstory species.

Today many upland drainageways have been cleared and converted to agriculture. Where they still occur, they are denser and their composition is usually altered. However, these areas of forest still play an important role as a source of food and shelter for wildlife. In addition, they are very important in channel stabilization.

Uncontrolled grazing by domestic livestock in these remaining areas of forest damages and kills smaller trees and removes the ground cover. Carefully planned timber harvests can be tolerated on these sites, but high grading of the timber will ultimately degrade the sites. Re-establishment of these riparian forests is important for stream quality and stream health, and as critical habitat for migratory birds. Planting of later successional species on the appropriate landscape position and soils has proven to be an effective means for restoration.

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	Grazing; 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 for 10+ years
1.2A	Disturbance events every 5-10 years
R2A	Forest stand improvement; livestock exclusion; extended rotations

Figure 8. 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 a wide variety of deciduous hardwood tree species, tolerant of seasonally wet conditions. Periodic disturbances from flooding, fire, wind or ice as well as grazing by native large herbivores maintained the forest 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
- pin oak (*Quercus palustris*), tree
- slippery elm (*Ulmus rubra*), tree
- hop sedge (*Carex lupulina*), grass
- squarrose sedge (*Carex squarrosa*), grass
- frost grape (*Vitis vulpina*), other herbaceous
- jewelweed (*Impatiens capensis*), other herbaceous

Community 1.1
Pin Oak – Bur Oak/Grape/Jewelweed – Sedge

This community phase is characterized by frequent flood events of short duration which impact on the canopy structure and species composition.

Forest overstory. The Overstory Species list is based on field surveys and commonly occurring species listed in Nelson (2010).

Forest understory. The Understory Species list is based on field surveys and commonly occurring species listed in Nelson (2010).

Community 1.2
Pin Oak – Bur Oak/Elm – Grape/Jewelweed – Sedge

This phase has a decrease in periodic disturbances including flooding, ice and wind reducing canopy gaps, allowing more shade tolerant species to successfully reproduce and move into the sub-canopy.

Pathway P1.1A
Community 1.1 to 1.2

This pathway is the result of lack of disturbance events for 10+ years.

Pathway P1.2A
Community 1.2 to 1.1

This pathway is the result of disturbance events occurring every 5-10 years.

State 2
Grazed/ 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*), grass

Community 2.1
Bur Oak – Elm – Hackberry/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. 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 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 the result of livestock grazing and repeated timber harvests.

Transition T1B
State 1 to 3

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

Transition T1C
State 1 to 4

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

Restoration pathway R2A
State 2 to 1

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

Transition T2B
State 2 to 4

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

Transition T3A
State 3 to 4

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

Transition T4A
State 4 to 3

This transition is the 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	–	–	–	–
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	–	–
squarrose sedge	CASQ2	*Carex squarrosa*	Native	–	–
sweet woodreed	CIAR2	*Cinna arundinacea*	Native	–	–
Forb/Herb					
smallspike false nettle	BOCY	*Boehmeria cylindrica*	Native	–	–
jewelweed	IMCA	*Impatiens capensis*	Native	–	–
Canadian woodnettle	LACA3	*Laportea canadensis*	Native	–	–
eastern waterleaf	HYVI	*Hydrophyllum virginianum*	Native	–	–
veiny skullcap	SCNE2	*Scutellaria nervosa*	Native	–	–
wingstem	VEAL	*Verbesina alternifolia*	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	–	–
calico aster	SYLAA	*Symphyotrichum lateriflorum var. angustifolium*	Native	–	–
Shrub/Subshrub					
northern spicebush	LIBE3	*Lindera benzoin*	Native	–	–
eastern poison ivy	TORA2	*Toxicodendron radicans*	Native	–	–
possumhaw	ILDE	*Ilex decidua*	Native	–	–
Tree					
Ohio buckeye	AEGL	*Aesculus glabra*	Native	–	–
American hornbeam	CACA18	*Carpinus caroliniana*	Native	–	–
Vine/Liana					
heartleaf peppervine	AMCO2	*Ampelopsis cordata*	Native	–	–
trumpet creeper	CARA2	*Campsis radicans*	Native	–	–
frost grape	VIVU	*Vitis vulpina*	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.

Periodic inundation and 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: Estimated site index values range from 60 to 70 for most species. 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. Maintain adequate riparian buffer areas.

Limitations: Wetness from flooding; 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 when wet. 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 Upland Drainageway Forest

No quality reference sites are known to exist.

Other references

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Contributors

Fred Young
Doug Wallace

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	03/13/2025
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:**

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3. **Number and height of erosional pedestals or terracettes:**

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4. **Bare ground from Ecological Site Description or other studies (rock, litter, lichen, moss, plant canopy are not bare ground):**

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5. **Number of gullies and erosion associated with gullies:**

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6. **Extent of wind scoured, blowouts and/or depositional areas:**

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7. **Amount of litter movement (describe size and distance expected to travel):**

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8. **Soil surface (top few mm) resistance to erosion (stability values are averages - most sites will show a range of values):**

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9. **Soil surface structure and SOM content (include type of structure and A-horizon color and thickness):**

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10. **Effect of community phase composition (relative proportion of different functional groups) and spatial distribution on infiltration and runoff:**

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11. **Presence and thickness of compaction layer (usually none; describe soil profile features which may be mistaken for compaction on this site):**

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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):**

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:**