USDA Natural Resources Conservation Service

Ecological site F116AY035MO
Wet Terrace 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.

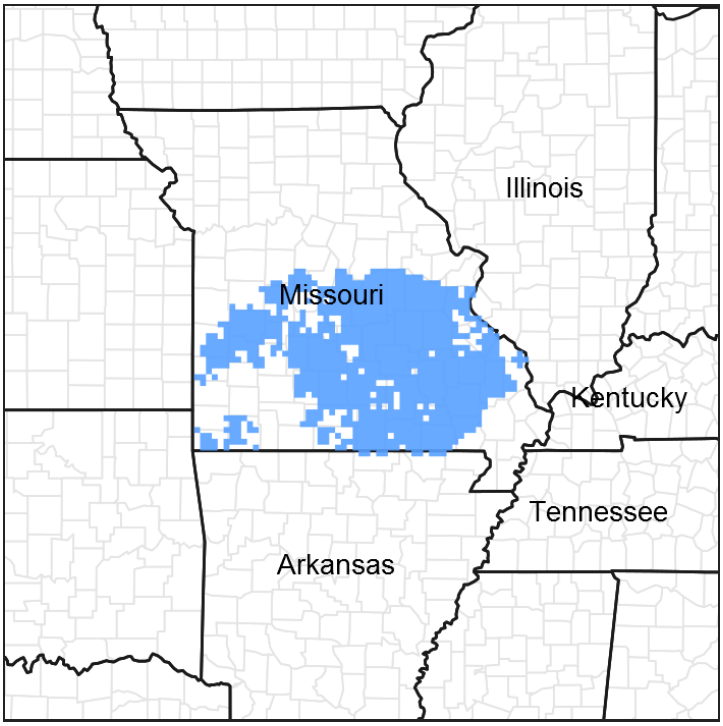


Figure 1. Mapped extent

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): 116A–Ozark Highland

The Ozark Highland constitutes the Salem Plateau of the Ozark Uplift. Elevation ranges from about 300 feet on the southeast edge of the Ozark escarpment, to about 1,600 feet in

the west, adjacent to the Burlington Escarpment of the Springfield Plateau. The underlying bedrock is mainly horizontally bedded Ordovician-aged dolomites and sandstones that dip gently away from the uplift apex in southeast Missouri. Cambrian dolomites are exposed on deeply dissected hillslopes. In some places, Pennsylvanian and Mississipian sediments overlie the plateau. Relief varies, from the gently rolling central plateau areas to deeply dissected hillslopes associated with drainageways such as the Buffalo, Current, Eleven Point and White Rivers.

Classification relationships

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 is widespread across the Ozark Highlands Section.

Ecological site concept

NOTE: This is a “provisional” Ecological Site Description (ESD) that is under development. It contains basic ecological information that can be used for conservation planning, application and land management. After additional information is collected, analyzed and reviewed, this ESD will be refined and published as “Approved”.

Wet Terrace Forests are widely distributed throughout the Ozark Highland. Soils are very deep with loamy to clayey subsoils, have a high water table in the Spring months, and are subject to flooding. 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

F116AY011MO	**Chert Upland Woodland** Chert Upland Woodlands, and other upland and backslope ecological sites, are upslope.

F116AY031MO	**Dry Footslope Forest** Dry Footslope Forests are upslope.
F116AY032MO	**Loamy Footslope Forest** Loamy Footslope Forests are upslope.
F116AY039MO	**Loamy Floodplain Step Forest** Loamy Floodplain Step Forests are adjacent and downslope.
F116AY042MO	**Sandy/Gravelly Floodplain Forest** Sandy/Gravelly Floodplain Forests and other floodplain ecological sites are downslope.

Similar sites

F116AY040MO	**Wet Floodplain Step Forest** Wet Floodplain Step Forests are usually lower on the landscape but have similar species composition and more flooding.

Table 1. Dominant plant species

Tree	(1) *Quercus macrocarpa* (2) *Carya laciniosa*
Shrub	(1) *Carpinus caroliniana*
Herbaceous	(1) *Chasmanthium latifolium*

Physiographic features

This site is on low stream terraces and high floodplains (floodplain steps), with slopes of 0 to 5 percent. The site generates some runoff to adjacent lower floodplain sites, and receives some runoff from higher stream terraces and uplands. This site is subject to rare to occasional flooding. Scour is uncommon in these flood events, and deposition is minimal, so ecological processes more closely resemble those of stream terrace systems.

The following figure (adapted from Holbrook and Childress, 2006) shows the typical landscape position of this ecological site, and landscape relationships with other ecological sites. It is within the area labeled “2” on the figure. Wet Terrace Forest sites are often associated with Loamy Terrace Forest sites, labeled “3”. Both sites are above the floodplain step and floodplain ecological sites.

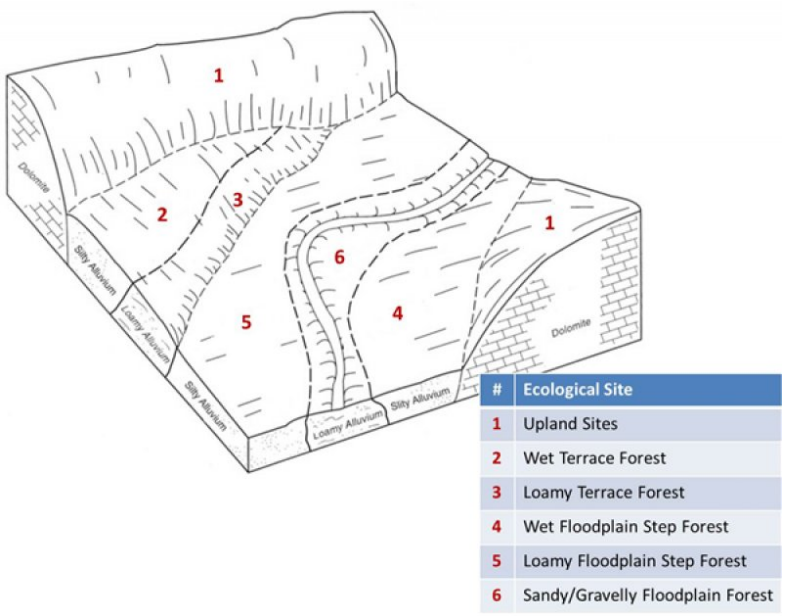


Figure 2. Landscape relationships for this ecological site.

Table 2. Representative physiographic features

Landforms	(1) Stream terrace (2) Flood-plain step
Flooding duration	Very brief (4 to 48 hours) to brief (2 to 7 days)
Flooding frequency	Rare to occasional
Ponding frequency	None
Slope	0–5%
Water table depth	0–24 in
Aspect	Aspect is not a significant factor

Climatic features

The Ozark Highland 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 Ozark Highland 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 crossing the MLRA from northwest to southeast.

The average annual precipitation in almost all of this area is 38 to 45 inches. Snow falls nearly every winter, but the snow cover lasts for only a few days. The average annual temperature is about 53 to 60 degrees F. The lower temperatures occur at the higher elevations in the western part of the MLRA. Mean January minimum temperature follows a stronger north-to-south 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 a northwest to southeast gradient. 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.

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. Deep sinkholes often have a microclimate significantly cooler, moister, and shadier than surrounding surfaces, a phenomenon that may result in a strikingly different ecology. 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; 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)	156-164 days

Freeze-free period (characteristic range)	186-193 days
Precipitation total (characteristic range)	44-47 in
Frost-free period (actual range)	151-165 days
Freeze-free period (actual range)	171-194 days
Precipitation total (actual range)	44-47 in
Frost-free period (average)	160 days
Freeze-free period (average)	187 days
Precipitation total (average)	46 in

Climate stations used

- (1) CLEARWATER DAM [USC00231674], Ellington, MO
- (2) FREEDOM [USC00233043], Linn, MO
- (3) MARSHFIELD [USC00235307], Marshfield, MO
- (4) OSCEOLA [USC00236402], Osceola, MO
- (5) WEST PLAINS [USC00238880], West Plains, MO

Influencing water features

This ecological site is influenced by a seasonal high water table from high groundwater levels. The water table is typically near the surface in late fall through spring, receding in the summer. This ecological site is on stream terraces and floodplain steps of perennial streams. They are not adjacent to the current stream channel. Areas on floodplain steps 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.

These sites are 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 have no rooting restriction. 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 surface horizons, and loamy or clayey subsoils with argillic horizons. They are affected by a seasonal high water table during the spring months. Soil series associated with this site include Baylock, Deible, Freeburg, Gabriel, Hacreek, Hartville, Higdon, Lostpond, Moniteau, Racoon, and Tanglenook.

The accompanying picture of the Deible series shows a clayey subsoil with dull gray

colors, indicating seasonal wetness. Scale is in centimeters. Picture courtesy of John Preston, NRCS.

Figure 9. Deible series

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	Very slow to moderately slow
Soil depth	72 in
Surface fragment cover <=3"	0–2%
Surface fragment cover >3"	0%
Available water capacity (0-40in)	7–9 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)	4.5–7.3

Subsurface fragment volume <=3" (Depth not specified)	0–20%
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.

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, shellbark hickory, American elm, green ash. Trees are generally large and tall forming a dense, closed canopy. 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. The understory is also complex, with multiple layers of shade tolerant species such as American hornbeam, northern spicebush, and Ohio buckeye. Grape vine, 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 Terrace Forests occur in protected landscape positions on stream terraces and high floodplains 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 hickory over historic conditions is common. The absence of periodic fire may have allowed more shade-tolerant tree species, such as sugar maple, white ash, or hickory to increase in abundance.

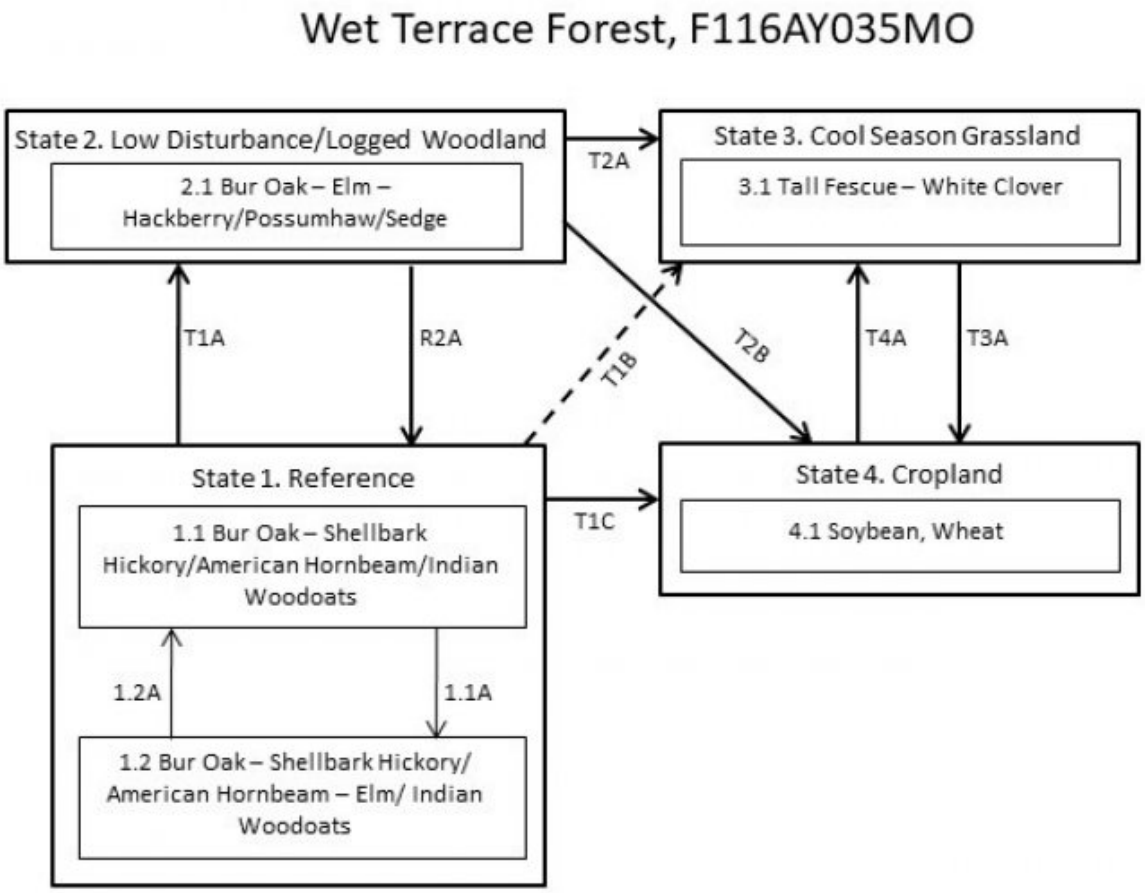
Uncontrolled domestic grazing has also diminished the diversity and cover of woodland ground flora species, and has often introduced weedy species such as gooseberry,

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. 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 terrace forests is important for stream quality and stream health, and as critical habitat for migratory birds.

Prescribed fire can play a beneficial but limited role in the management of this ecological site. Terrace 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.

State and transition model



Code	Event/Activity/Process
T1A	Lack of 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 disturbance events 10+ years
1.2A	Disturbance events 2-5 years
R2A	Forest stand improvement;

Figure 10. 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 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. Reference states are very rare today. Fire suppression and altered drainage have resulted in increased canopy density, which has affected the abundance and diversity of ground flora. Most reference states are currently altered because of timber harvesting, clearing and conversion to grassland or cropland.

Dominant plant species

- bur oak (*Quercus macrocarpa*), tree
- shellbark hickory (*Carya laciniosa*), tree
- American hornbeam (*Carpinus caroliniana*), shrub
- Indian woodoats (*Chasmanthium latifolium*), grass

Community 1.1
Bur Oak – Shellbark Hickory/American Hornbeam/Indian Woodoats

Figure 11. Reference state on the Current River Area, Ozark National Scenic Riverway; photo credit MDC

Periodic disturbances from flooding, wind or ice as well as grazing by native large herbivores influenced the forest structure and diverse ground flora species. Two community phases are recognized in the reference state, with shifts between phases based on disturbance frequency.

Forest overstory. The Overstory Species list is based on field reconnaissance as well as commonly occurring species listed in Nelson 2010; names and symbols are from USDA PLANTS database.

Forest understory. The Understory Species list is based on field reconnaissance as well as commonly occurring species listed in Nelson 2010; names and symbols are from USDA PLANTS database.

Community 1.2
Bur Oak –Shellbark Hickory – Shumard Oak/Blue Beech/River Oats

Pathway P1.1A
Community 1.1 to 1.2

Lack of disturbance events 10 plus years

Pathway P1.2A
Community 1.2 to 1.1

Disturbance events 2-5 years.

State 2
Low Disturbance/ Logged Forest

Composition and structure are altered from the reference state due to subjective 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
- elm (*Ulmus*), tree
- hackberry (*Celtis*), tree
- possumhaw (*Ilex decidua*), shrub
- sedge (*Carex*), grass

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

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 isolated oak. 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

State 4
Cropland

This is a state that exists currently with intensive cropping of primarily soybeans and wheat. Some conversion to non-native 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 max*), other herbaceous

Community 4.1
Soybean, Wheat

Transition T1A
State 1 to 2

Lack of disturbance events greater than 20 years ; repeated timber harvests.

Transition T1B
State 1 to 3

Woody removal; tillage; vegetative seeding; grassland management.

Transition T1C
State 1 to 4

Woody removal; tillage; conservation cropping system.

Restoration pathway R2A

State 2 to 1

Forest stand improvement; prescribed fire

Transition T2A
State 2 to 3

Woody removal; tillage; vegetative seeding; grassland management.

Transition T2B
State 2 to 4

Woody removal; tillage; conservation cropping system.

Transition T3A
State 3 to 4

Tillage; conservation cropping system.

Transition T4A
State 4 to 3

Vegetative seeding; 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							
pin oak	QUPA2	*Quercus palustris*	Native	–	–	–	–
swamp white oak	QUBI	*Quercus bicolor*	Native	–	–	–	–
bur oak	QUMA2	*Quercus macrocarpa*	Native	–	–	–	–
shellbark hickory	CALA21	*Carya laciniosa*	Native	–	–	–	–
white oak	QUAL	*Quercus alba*	Native	–	–	–	–
American elm	ULAM	*Ulmus americana*	Native	–	–	–	–
bitternut hickory	CACO15	*Carya cordiformis*	Native	–	–	–	–
Shumard's oak	QUSH	*Quercus shumardii*	Native	–	–	–	–
boxelder	ACNE2	*Acer negundo*	Native	–	–	–	–
northern red oak	QURU	*Quercus rubra*	Native	–	–	–	–
green ash	FRPE	*Fraxinus pennsylvanica*	Native	–	–	–	–
sugarberry	CELA	*Celtis laevigata*	Native	–	–	–	–
honeylocust	GLTR	*Gleditsia triacanthos*	Native	–	–	–	–
American sycamore	PLOC	*Platanus occidentalis*	Native	–	–	–	–
American basswood	TIAM	*Tilia americana*	Native	–	–	–	–
bitternut hickory	CACO15	*Carya cordiformis*	Native	–	–	–	–
pecan	CAIL2	*Carya illinoinensis*	Native	–	–	–	–
slippery elm	ULRU	*Ulmus rubra*	Native	–	–	–	–
common hackberry	CEOC	*Celtis occidentalis*	Native	–	–	–	–

Table 6. Community 1.1 forest understory composition

				Height	Canopy

Common Name	Symbol	Scientific Name	Nativity	Height (Ft)	Canopy Cover (%)
Grass/grass-like (Graminoids)					
whitegrass	LEVI2	*Leersia virginica*	Native	–	–
Virginia wildrye	ELVI3	*Elymus virginicus*	Native	–	–
limestone meadow sedge	CAGR3	*Carex granularis*	Native	–	–
fuzzy wuzzy sedge	CAHI6	*Carex hirsutella*	Native	–	–
Indian woodoats	CHLA5	*Chasmanthium latifolium*	Native	–	–
rosy sedge	CARO22	*Carex rosea*	Native	–	–
eastern woodland sedge	CABL	*Carex blanda*	Native	–	–
blue sedge	CAGL6	*Carex glaucodea*	Native	–	–
Gray's sedge	CAGR5	*Carex grayi*	Native	–	–
sweet woodreed	CIAR2	*Cinna arundinacea*	Native	–	–
fowl mannagrass	GLST	*Glyceria striata*	Native	–	–
Forb/Herb					
jumpseed	POVI2	*Polygonum virginianum*	Native	–	–
sharpwing monkeyflower	MIAL2	*Mimulus alatus*	Native	–	–
American ginseng	PAQU	*Panax quinquefolius*	Native	–	–
wingstem	VEAL	*Verbesina alternifolia*	Native	–	–
spring avens	GEVE	*Geum vernum*	Native	–	–
twoflower dwarfdandelion	KRBI	*Krigia biflora*	Native	–	–
Canadian woodnettle	LACA3	*Laportea canadensis*	Native	–	–
tall thoroughwort	EUAL3	*Eupatorium altissimum*	Native	–	–
licorice bedstraw	GACI2	*Galium circaezans*	Native	–	–
white snakeroot	AGAL5	*Ageratina altissima*	Native	–	–
fewflower ticktrefoil	DEPA7	*Desmodium pauciflorum*	Native	–	–
mayapple	POPE	*Podophyllum peltatum*	Native	–	–
dotted smartweed	POPU5	*Polygonum punctatum*	Native	–	–
stalked wild petunia	RUPE4	*Ruellia pedunculata*	Native	–	–
Canadian blacksnakeroot	SACA15	*Sanicula canadensis*	Native	–	–
smallspike false nettle	BOCY	*Boehmeria cylindrica*	Native	–	–

jewelweed	IMCA	*Impatiens capensis*	Native	–	–
Canadian clearweed	PIPU2	*Pilea pumila*	Native	–	–
eastern waterleaf	HYVI	*Hydrophyllum virginianum*	Native	–	–
bottomland aster	SYON2	*Symphyotrichum ontarionis*	Native	–	–
pale touch-me-not	IMPA	*Impatiens pallida*	Native	–	–
foxglove beardtongue	PEDI	*Penstemon digitalis*	Native	–	–
bristly buttercup	RAHI	*Ranunculus hispidus*	Native	–	–
limestone wild petunia	RUST2	*Ruellia strepens*	Native	–	–
cutleaf coneflower	RULA3	*Rudbeckia laciniata*	Native	–	–
blue skullcap	SCLA2	*Scutellaria lateriflora*	Native	–	–
giant goldenrod	SOGI	*Solidago gigantea*	Native	–	–
calico aster	SYLAA	*Symphyotrichum lateriflorum var. angustifolium*	Native	–	–
Fern/fern ally					
Christmas fern	POAC4	*Polystichum acrostichoides*	Native	–	–
sparselobe grapefern	BOBI	*Botrychium biternatum*	Native	–	–
sensitive fern	ONSE	*Onoclea sensibilis*	Native	–	–
Shrub/Subshrub					
northern spicebush	LIBE3	*Lindera benzoin*	Native	–	–
pawpaw	ASTR	*Asimina triloba*	Native	–	–
possumhaw	ILDE	*Ilex decidua*	Native	–	–
eastern leatherwood	DIPA9	*Dirca palustris*	Native	–	–
Tree					
American hornbeam	CACA18	*Carpinus caroliniana*	Native	–	–
Ohio buckeye	AEGL	*Aesculus glabra*	Native	–	–
Vine/Liana					
eastern poison ivy	TORA2	*Toxicodendron radicans*	Native	–	–
saw greenbrier	SMBO2	*Smilax bona-nox*	Native	–	–
bristly greenbrier	SMTA2	*Smilax tamnoides*	Native	–	–
summer grape	VIAE	*Vitis aestivalis*	Native	–	–
riverbank grape	VIRI	*Vitis riparia*	Native		

riverbank grape	VIRI	*Vitis riparia*	Native	–	–
heartleaf peppervine	AMCO2	*Ampelopsis cordata*	Native	–	–
trumpet creeper	CARA2	*Campsis radicans*	Native	–	–
catbird grape	VIPA7	*Vitis palmata*	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: Field measured site index values range from 58 to 75. On the wettest sites, timber management opportunities may be limited. Management of these groups may be difficult because of the great variation in species, age, stocking levels and seasonal wetness. Use seed-tree, group selection, or clear cutting regeneration methods. Harvest favoring reproduction of the less-shade tolerant species such as bur oak, Shumard oak, swamp white oak, sycamore, and cottonwood. 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. 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 Terrace Forest

Plot LOLICA02 - Racoon soil
Located in Loutre Lick Access, Montgomery County, MO
Latitude: 38.881251
Longitude: -91.585828

Plot WOWOCA05 – Freeburg soil
Located in Woodson K. Woods CA, Phelps & Crawford Counties, MO
Latitude: 37.96897
Longitude: -91.530006

Plot BISMCA02 – Deible soil
Located in Bismarck CA, St. Francois County, MO
Latitude: 37.71636
Longitude: -90.650584

Plot CURINP04 – Racoon soil
Located in Current River Area, Ozark National Scenic Riverways, NPS, Carter County, MO
Latitude: 37.085043
Longitude: -91.058551

Other references

Anderson, R.C. 1990. The historic role of fire in North American grasslands. Pp. 8-18 in S.L. Collins and L.L. Wallace (eds.). Fire in North American tallgrass prairies. University of Oklahoma Press, Norman.

Batek, M.J., A.J. Rebertus, W.A. Schroeder, T.L. Haithcoat, E. Compas, and R.P. Guyette. 1999. Reconstruction of early nineteenth-century vegetation and fire regimes in the Missouri Ozarks. Journal of Biogeography 26:397-412.

Brinson, M.M. 1993. A hydrogeomorphic classification for wetlands. Technical Report WRP-DE-4, U.S. Army Corps of Engineers, Engineer Waterways Experiment Station, Vicksburg, MS.

Cowardin, L.M., V. Carter, F.C. Golet, & E.T. LaRoe. 1979. Classification of wetlands and deepwater habitats of the United States. U.S. Dept. of Interior, Fish & Wildlife Service, Office of Biological Services, Washington DC.

Harlan, J.D., T.A. Nigh and W.A. Schroeder. 2001. The Missouri original General Land Office survey notes project. University of Missouri, Columbia.

Holbrook, Donald, and J. Daniel Childress. 2006. Soil Survey of Bollinger County, Missouri. U.S. Dept. of Agric. Natural Resources Conservation Service.

Ladd, D. 1991. Reexamination of the role of fire in Missouri oak woodlands. Pp. 67-80 in G.V. Brown, James K.; Smith, Jane Kapler, eds. 2000. Wildland fire in ecosystems: effects of fire on flora. Gen. Tech. Rep. RMRS-GTR-42-vol. 2. Ogden, UT: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station. 257 p.

Missouri Department of Conservation. 2010. Missouri Forest and Woodland Community Profiles. Missouri Department of Conservation, Jefferson City, Missouri.

Natural Resources Conservation Service. 2002. Woodland Suitability Groups. Missouri FOTG, Section II, Soil Interpretations and Reports. 30 pgs.

Natural Resources Conservation Service. Site Index Reports. Downloaded 2015. https://esi.sc.egov.usda.gov/ESI_Forestland/pgFSWelcome.aspx

NatureServe, 2010. Vegetation Associations of Missouri (revised). NatureServe, St. Paul, Minnesota.

Nelson, Paul W. 2010. The Terrestrial Natural Communities of Missouri. Missouri Department of Conservation, Jefferson City, Missouri. 550p.

Nigh, Timothy A. and Walter A. Schroeder. 2002. Atlas of Missouri Ecoregions. Missouri Department of Conservation, Jefferson City, Missouri. 212p.

Schoolcraft, H.R. 1821. Journal of a tour into the interior of Missouri and Arkansas from Potosi, or Mine a Burton, in Missouri territory, in a southwest direction, toward the Rocky Mountains: performed in the years 1818 and 1819. Richard Phillips and Company, London.

United States Department of Agriculture – Natural Resource Conservation Service (USDA-NRCS). 2006. Land Resource Regions and Major Land Resource Areas of the United States, the Caribbean, and the Pacific Basin. U.S. Department of Agriculture Handbook 296. 682 pgs.

Contributors

Fred Young
Doug Wallace

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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	04/11/2026
Approved by	Nels Barrett
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:**

   ---

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):**

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):**

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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:**
