USDA Natural Resources
Conservation Service

Ecological site F116AY046MO
Loamy Exposed Backslope Woodland

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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 Dry-Mesic Loess/Glacial Till Woodland.

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

National Vegetation Classification System Vegetation Association (NatureServe, 2010):

The reference state for this ecological site is most similar to Quercus alba - Quercus stellata - Quercus velutina / Schizachyrium scoparium Woodland (CEGL002150).

Geographic relationship to the Missouri Ecological Classification System (Nigh & Schroeder, 2002):
This ecological site occurs primarily in the Inner Ozark Border Subsection.

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”.

The Loamy Exposed Backslope Woodlands occupy the southerly and westerly aspects of steep, dissected slopes, and are mapped in complex with the Loamy Protected Backslope Forest ecological site. Loamy Backslope ecological sites occur primarily in the Ozark border counties near the boundary with MLRA 115B, where loess from the Missouri and Mississippi river valleys has been deposited and the southern areas of the MLRA. Soils are very deep, and are silt loam loess overlying gravelly residuum. The reference plant community is woodland with an overstory dominated by black oak, white oak, and hickory and a ground flora of native grasses and forbs.

Associated sites

F116AY037MO	**Gravelly/Loamy Upland Drainageway Forest** Gravelly/Loamy Upland Drainageway Forests are often downslope.
F116AY004MO	**Fragipan Upland Woodland** Fragipan Upland Woodlands are upslope on summits where a fragipan is present in the subsoil.
F116AY008MO	**Loamy Upland Woodland** Loamy Upland Woodlands are upslope on summits and shoulders.
F116AY016MO	**Chert Dolomite Protected Backslope Forest** Chert Dolomite Protected Backslope Forests are upslope or adjacent, where loess is thinner and dolomite bedrock is within 40 inches.
F116AY030MO	**Loamy Protected Backslope Forest** Loamy Protected Backslope Forests are mapped in complex with this ecological site, on steep lower backslopes with northern to eastern exposures.

Similar sites

F116AY030MO	**Loamy Protected Backslope Forest** Loamy Protected Backslope Forests are mapped in complex with this ecological site, on steep lower backslopes with northern to eastern exposures.

Table 1. Dominant plant species

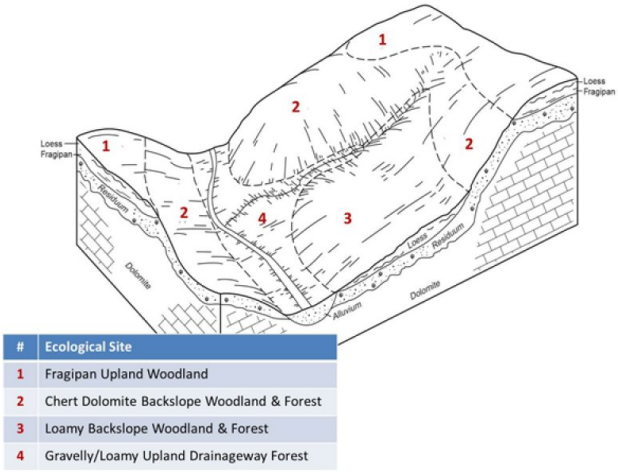
Tree	(1) *Quercus alba* (2) *Quercus velutina*
Shrub	(1) *Rhus aromatica*
Herbaceous	(1) *Elymus virginicus* (2) *Solidago ulmifolia*

Physiographic features

This site is on upland backslopes, with slopes of 15 to 35 percent. It is on exposed aspects (south, southwest, and west), which receive significantly more solar radiation than the protected aspects. The site generates runoff to adjacent, downslope ecological sites. This site does not flood.

The adjacent figure (adapted from Davis, 2002) shows the typical landscape position of this ecological site, and landscape relationships with other ecological sites. It is within the area labeled “3”, on backslopes with southerly to

westerly exposures. Loamy Protected Backslope Forest sites are on the corresponding northerly to easterly exposures. Footslopes and shoulders within the area are in the Loamy Upland Woodland ecological site. A variety of ecological sites occur in areas where the loess is thinner, such as the Chert Dolomite Backslope sites shown here. Upslope crests are commonly Fragipan Upland Woodland sites.



#	Ecological Site
1	Fragipan Upland Woodland
2	Chert Dolomite Backslope Woodland & Forest
3	Loamy Backslope Woodland & Forest
4	Gravelly/Loamy Upland Drainageway Forest

Figure 2. Landscape relationships for this ecological site.

Table 2. Representative physiographic features

Landforms	(1) Hill (2) Hillslope
Flooding frequency	None
Ponding frequency	None
Slope	15–35%
Water table depth	20–60 in
Aspect	W, SE, S, SW

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)	150-152 days
Freeze-free period (characteristic range)	170-185 days
Precipitation total (characteristic range)	46-49 in
Frost-free period (actual range)	150-154 days
Freeze-free period (actual range)	167-190 days
Precipitation total (actual range)	45-50 in
Frost-free period (average)	151 days
Freeze-free period (average)	178 days
Precipitation total (average)	48 in

Climate stations used

- (1) MARBLE HILL [USC00235253], Marble Hill, MO
- (2) CALICO ROCK 2 WSW [USC00031132], Calico Rock, AR
- (3) FREEDOM [USC00233043], Linn, MO

Influencing water features

Water features associated with this upland ecological site are influenced by karst landscapes throughout the area (see diagram). Rainfall enters the groundwater system through the soil or by flowing into sinkholes and streams. Springs form where land drops low enough to meet underground water tables. Dissolution of carbonate rocks along fractures and faults has produced cave systems, sinkholes (closed and open), springs, and natural tunnels in the region. These sinkholes and losing streams can rapidly transfer water from upland recharge areas to spring outlets. The most common mechanism for groundwater recharge occurs by the relatively slow downward movement of water through soil and carbonate bedrock over a large area known as diffuse recharge, which maintains a high storage volume providing a consistent supply of water to springs. In addition to diffuse recharge, aquifers in karst terrain receive the relatively rapid transfer of water through sinkholes or losing streams connected by subsurface conduits. Surface water entering the aquifer in this fashion has very little contact with soil or rock and consequently the chemical nature of the water changes little in route. Discharge variability does not seem to be controlled by drainage area, but rather the conduit capacity of losing stream sections that can transport the entire volume of base-

flow during dry periods in the year. High variability in base ?ow shows the impact of karst in the form of losing and gaining stream sections (Owen and Pavlowsky 2010).

The accompanying map depicts the distribution of these karst-related features in the state of Missouri. Relative cave density per USGS 7.5" quadrangle is depicted by shades of red, deeper red signifying a larger number of caves in the quadrangle. Stretches of losing streams are shown in yellow. Known springs are shown as blue dots. Image from Wikimedia Commons developed from the Missouri Department of Natural Resources, Division of Geology and Land Survey.

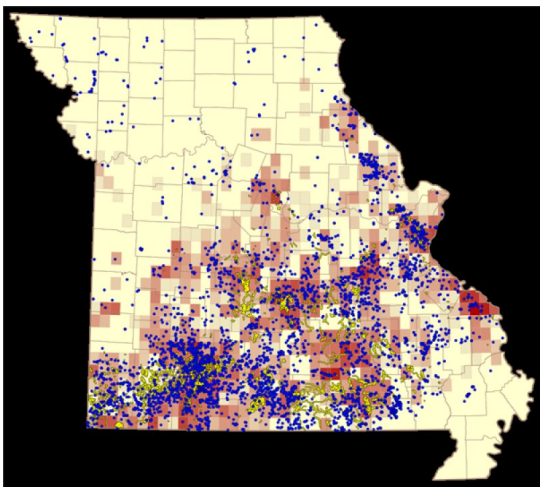


Figure 9. Distribution of karst-related features in Missouri. Image from Wikimedia Commons developed from the Missouri Department of Natural Resources, Division of Geology and Land Survey.

Soil features

These soils have no major rooting restriction. The soils were formed under woodland vegetation, and have thin, light-colored surface horizons. Parent material is loess over slope alluvium over residuum weathered from limestone and dolomite. The soils have silt loam surface horizons. Subsoils are silty clay loam in the upper part, and are very gravelly and cobbly silty clay loam, clay loam to clay in the underlying slope alluvium and residuum. These soils are not affected by seasonal wetness. Some soils have bedrock between 40 and 60 inches, but this does not significantly affect native vegetation. Soil series associated with this site include Bucklick, Gravois, Peridge, Useful, and Wrengart.

The accompanying picture of the Peridge series shows a thin, light-colored silt loam surface horizon over a reddish brown silty clay loam subsoil. Red very gravelly clay is typically below one meter in these soils, and appears at the very bottom of this picture. Scale is in centimeters. Picture courtesy of John Preston, NRCS.

Figure 10. Peridge series

Table 4. Representative soil features

Parent material	(1) Slope alluvium–limestone and dolomite (2) Residuum–limestone and dolomite
Surface texture	(1) Silt loam
Family particle size	(1) Loamy
Drainage class	Moderately well drained to well drained
Permeability class	Very slow to moderately slow
Soil depth	40–72 in
Surface fragment cover <=3"	0%
Surface fragment cover >3"	0%
Available water capacity (0-40in)	6–8 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)	20–35%
Subsurface fragment volume >3" (Depth not specified)	0–40%

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 reference plant community is well developed woodland dominated by an overstory of black oak, white oak, and hickory species. The canopy is moderately tall (70 to 85 feet) but less dense (65 to 85 percent closure) than protected slopes and the understory is poorly developed with less structural diversity. It is on exposed aspects (south, southwest, and west), which receive significantly more solar radiation than the protected aspects. Increased light causes a diversity of ground flora species to flourish. In addition, proximity to shallow soil glades and open woodlands provides additional opportunity for increased light and species diversity. Woodlands are distinguished from forest, by their relatively open understory, and the presence of sun-loving ground flora species. Characteristic plants in the ground flora can be used to gauge the restoration potential of a stand along with remnant open-grown old-age trees, and tree height growth.

Fire played an important role in the maintenance of these systems. It is likely that these ecological sites burned at least once every 5 to 10 years. These periodic fires kept woodlands open, removed the litter, and stimulated the growth and flowering of the grasses and forbs. During fire free intervals, woody understory species increased and the herbaceous understory diminished. The return of fire would open the woodlands up again and stimulate the abundant ground flora.

Loamy Exposed Backslope Woodlands were also subjected to occasional disturbances from wind and ice, as well

as grazing by native large herbivores, such as bison, elk, and white-tailed deer. Wind and ice would have periodically opened the canopy up by knocking over trees or breaking substantial branches off canopy trees. Grazing by native large herbivores would have effectively kept understory conditions more open, creating conditions more favorable to oak reproduction.

Today, these ecological sites have been cleared and converted to pasture or have undergone repeated timber harvest and domestic grazing. Most existing forested ecological sites have a younger (50 to 80 years) canopy layer whose species composition and quality has been altered by timber harvesting practices. In the long term absence of fire, woody species, especially hickory, hornbeam and gooseberry encroach into these woodlands. Once established, these woody plants can quickly fill the existing understory increasing shade levels with a greatly diminished ground flora. Removal of the younger understory and the application of prescribed fire have proven to be effective restoration means.

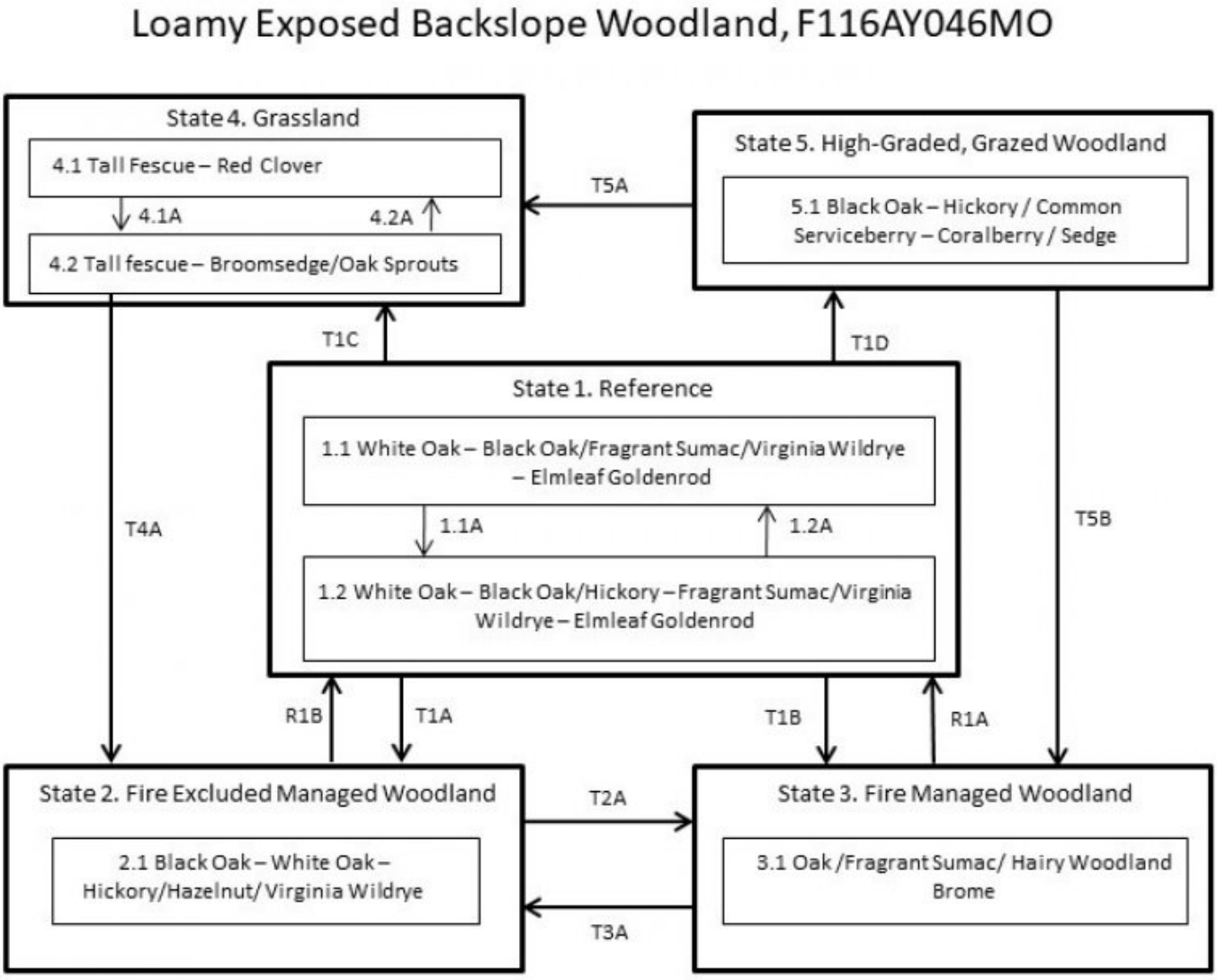
Uncontrolled domestic grazing has also impacted these communities, further diminishing the diversity of native plants and introducing species that are tolerant of grazing, such as coralberry, gooseberry, and Virginia creeper. Grazed sites also have a more open understory. In addition, soil compaction and soil erosion can be a problem and lower productivity.

These ecological sites are moderately productive. Oak regeneration is typically problematic. Slippery elm, hophornbeam, hickory are often dominant competitors in the understory. Maintenance of the oak component will require disturbances such as prescribed fire and thinning that will encourage more sun adapted species and reduce shading effects.
Single tree selection timber harvests are common in this region and often results in removal of the most productive trees (high grading) in the stand leading to poorer quality timber and a shift in species composition away from more valuable oak species. Better planned single tree selection or the creation of group openings can help regenerate and maintain more desirable oak species and increase vigor on the residual trees.

Clearcutting also occurs and results in dense, even-aged stands dominated by 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, and periodic fires, the ground flora diversity can be shaded out and diversity of the stand may suffer.

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	Activity/Event/Process
T1A	Even-aged management
T1B	Fire suppression; uneven-age management
T2B	Prescribed fire; thinning; grazing management
T1C, T5A	Clearing; pasture planting
T1D	Poorly planned harvest; uncontrolled grazing
T2A	Prescribed fire; forest stand improvement
T3A	Even-age management; fire exclusion
T4A	Tree planting; long-term succession; no grazing
T5B	Forest management; no grazing; fire

Code	Activity/Event/Process
1.1A	No disturbance (10+ years)
1.2A	Disturbance (fire, wind, ice) < 10 years
4.1A	Over grazing; no fertilization
4.2A	Brush management; grassland seeding; grassland management

Code	Activity/Event/Process
R1A	Prescribed fire; extended rotations
R1B	Uneven-age management; extended rotations

Figure 11. State and transition diagram for this ecological site

State 1

Reference

The historical reference state for this ecological site was old growth, oak woodland. The reference state was dominated by white oak and black oak. Periodic disturbances from fire, wind or ice 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 rare today. Many sites have been converted to grassland (State 4). Others have been subject to repeated, high-graded timber harvest coupled with uncontrolled domestic livestock grazing (State 5). Fire suppression has resulted in increased canopy density, which has affected the abundance and diversity of ground flora. Some former reference states have been managed as woodlands with fire (State 2) or without fire (State 3).

Community 1.1
White Oak – Black Oak/Fragrant Sumac/Virginia Wildrye – Elmleaf Goldenrod

Periodic disturbances from fire, wind or ice maintained the woodland structure and diverse ground flora species.

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
White Oak – Black Oak/Hickory – Fragrant Sumac/Virginia Wildrye – Elmleaf Goldenrod

Figure 12. Fire limited phase in the Current River Conservation Area, near Ellington, Missouri; photo credit MDC.

Long disturbance-free periods allowed an increase in both the density of trees and the abundance of shade tolerant species.

Forest overstory. The Overstory Species list is based on field surveys and commonly occurring species listed

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

Pathway P1.1A
Community 1.1 to 1.2

No disturbance (10+ years)

Pathway P1.2A
Community 1.2 to 1.1

Disturbance (fire, wind, ice) < 10 years

State 2
Fire Excluded Managed Woodland

These stands will slowly increase in more shade tolerant species and white oak will become less dominant. These woodlands tend to be rather dense, with a sparse understory and ground flora. Thinning can increase overall tree vigor and improve understory diversity. However, in the absence of fire, the diversity and cover of the ground flora is still diminished. Without periodic disturbance, stem density and fire intolerant species, like sassafras and hickory, increase in abundance. Prescribed fire along with a more open canopy can transition this state to a Fire Managed Woodland state (State 3).

Community 2.1
Black Oak – White Oak – Hickory/Hazelnut/ Virginia Wildrye

Forest overstory. The Overstory Species list is based on field surveys and commonly occurring species listed

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

State 3
Fire Managed Woodland

The Fire Managed Woodland state results from managing woodland communities (States 2) with prescribed fire and canopy thinning,. This state can resemble the reference state, but with younger maximum tree ages, more open canopies and lower ground flora diversity. Cessation of prescribed fire will allow transition to various managed woodland states.

Community 3.1
Oak /Fragrant Sumac/ Hairy Woodland Brome

Forest overstory. The Overstory Species list is based on field surveys and commonly occurring species listed

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

State 4
Grassland

Conversion of woodlands to planted, non-native cool season grassland species such as tall fescue is common for this region. Steep slopes, surface fragments, low organic matter contents and soil acidity make grasslands harder to maintain in a healthy, productive state on this ecological site. Two community phases are recognized in the grassland state, with shifts between phases based on types of management. Poor management will result in a shift to Community 4.2 that shows an increase in oak sprouting and increases in broomsedge densities.

Community 4.1
Tall Fescue - Red Clover

Two community phases are recognized in the grassland state, with shifts between phases based on types of management.

Forest overstory. The Overstory Species list is based on field surveys and commonly occurring species listed

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

Community 4.2
Tall fescue - Broomsedge/Oak Sprouts

Poor management will result in a shift to Community 4.2 that shows an increase in oak sprouting and increases in broomsedge densities.

Forest overstory. The Overstory Species list is based on field surveys and commonly occurring species listed

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

Pathway P4.1A
Community 4.1 to 4.2

Over grazing; no fertilization

Pathway P4.2A
Community 4.2 to 4.1

Brush management; grassland seeding; grassland management

State 5
High-Graded/Grazed Woodland

States that were subjected to repeated, high-grading timber harvests and uncontrolled domestic grazing transitioned to a High-Graded, Grazed Woodland state. This state exhibits an over-abundance of hickory and other less desirable tree species, and weedy understory species such as coralberry, gooseberry, poison ivy and Virginia creeper. The existing vegetation offers little nutritional value for cattle, and excessive cattle stocking damages tree boles, degrades understory species composition and results in soil compaction and accelerated erosion and runoff. Two common transitions from this state are woody clearing and conversion to State 4, grassland or removing livestock, limited harvesting, and allowing long term succession to occur to some other woodland state.

Community 5.1
Black Oak – Hickory / Common Serviceberry – Coralberry / Sedge

Forest overstory. The Overstory Species list is based on field surveys and commonly occurring species listed

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

Transition T1A
State 1 to 2

Harvesting; even-aged management; fire exclusion

Transition T1B
State 1 to 3

Uneven-age management; prescribed fire

Transition T1C
State 1 to 4

Clearing; pasture planting; grassland management

Transition T1D

State 1 to 5

Poorly planned harvests; uncontrolled grazing

Restoration pathway R1B
State 2 to 1

Uneven-age management; extended rotations; prescribed fire

Transition T2A
State 2 to 3

Prescribed fire; forest stand improvement

Restoration pathway R1A
State 3 to 1

Prescribed fire; extended rotations

Transition T3A
State 3 to 2

Even-age management; fire exclusion

Transition T4A
State 4 to 2

Tree planting; long-term succession; no grazing

Transition T5B
State 5 to 3

Forest management; no grazing; prescribed fire

Transition T5A
State 5 to 4

Clearing; pasture planting; 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							
white oak	QUAL	*Quercus alba*	Native	–	–	–	–
black oak	QUVE	*Quercus velutina*	Native	–	–	–	–
pignut hickory	CAGL8	*Carya glabra*	Native	–	–	–	–
black hickory	CATE9	*Carya texana*	Native	–	–	–	–
post oak	QUST	*Quercus stellata*	Native	–	–	–	–
sassafras	SAAL5	*Sassafras albidum*	Native	–	–	–	–
shagbark hickory	CAOV2	*Carya ovata*	Native	–	–	–	–
mockernut hickory	CATO6	*Carya tomentosa*	Native	–	–	–	–

Table 6. Community 1.1 forest understory composition

Common Name	Symbol	Scientific Name	Nativity	Height (Ft)	Canopy Cover (%)
Grass/grass-like (Graminoids)					
Bosc's panicgrass	DIBO2	*Dichanthelium boscii*	Native	–	–
hairy woodland brome	BRPU6	*Bromus pubescens*	Native	–	–
oval-leaf sedge	CACE	*Carex cephalophora*	Native	–	–
Muhlenberg's sedge	CAMU4	*Carex muehlenbergii*	Native	–	–
eastern star sedge	CARA8	*Carex radiata*	Native	–	–
reflexed sedge	CARE9	*Carex retroflexa*	Native	–	–
Indian woodoats	CHLA5	*Chasmanthium latifolium*	Native	–	–
little bluestem	SCSC	*Schizachyrium scoparium*	Native	–	–
Virginia wildrye	ELVI3	*Elymus virginicus*	Native	–	–
eastern bottlebrush grass	ELHY	*Elymus hystrix*	Native	–	–
rock muhly	MUSO	*Muhlenbergia sobolifera*	Native	–	–
Forb/Herb					
nakedflower ticktrefoil	DENU4	*Desmodium nudiflorum*	Native	–	–
pointedleaf ticktrefoil	DEGL5	*Desmodium glutinosum*	Native	–	–
hairy sunflower	HEHI2	*Helianthus hirsutus*	Native	–	–
violet lespedeza	LEVI6	*Lespedeza violacea*	Native	–	–
Canadian blacksnakeroot	SACA15	*Sanicula canadensis*	Native	–	–
yellow passionflower	PALU2	*Passiflora lutea*	Native	–	–
Dillenius' ticktrefoil	DEGL4	*Desmodium glabellum*	Native	–	–
eastern purple coneflower	ECPU	*Echinacea purpurea*	Native	–	–
shining bedstraw	GACO3	*Galium concinnum*	Native	–	–
spotted geranium	GEMA	*Geranium maculatum*	Native	–	–
eastern greenviolet	HYCO6	*Hybanthus concolor*	Native	–	–
bluejacket	TROH	*Tradescantia ohiensis*	Native	–	–
feathery false lily of the valley	MARA7	*Maianthemum racemosum*	Native	–	–
widowsfrill	SIST	*Silene stellata*	Native	–	–
elmleaf goldenrod	SOUL2	*Solidago ulmifolia*	Native	–	–
white arrowleaf aster	SYUR	*Symphyotrichum urophyllum*	Native	–	–
Shrub/Subshrub					
fragrant sumac	RHAR4	*Rhus aromatica*	Native	–	–
Carolina buckthorn	FRCA13	*Frangula caroliniana*	Native	–	–
American hazelnut	COAM3	*Corylus americana*	Native	–	–
winged elm	ULAL	*Ulmus alata*	–	–	–
Tree					
flowering dogwood	COFL2	*Cornus florida*	Native	–	–
eastern redbud	CECA4	*Cercis canadensis*	Native	–	–
hophornbeam	OSVI	*Ostrya virginiana*	Native	–	–

Animal community

Wildlife (MDC 2006):

Wild turkey, white-tailed deer, and eastern gray squirrel depend on hard and soft mast food sources and are typical

upland game species of this type.

Oaks provide abundant hard mast; scattered shrubs provide soft mast; native legumes provide high-quality wildlife food;

Sedges and native cool-season grasses provide green browse; native warm-season grasses provide cover and nesting habitat; and a diversity of forbs provides a diversity and abundance of insects.

Post-burn areas can provide temporary bare-ground – herbaceous cover habitat important for turkey poults and quail chicks.

Bird species associated with mid- to late successional woodlands to maturing are Indigo Bunting, Red-headed Woodpecker, Eastern Bluebird, Northern Bobwhite, Summer Tanager, Eastern Wood-Pewee, Whip-poor-will, Chuck-will's widow, Red-eyed Vireo, Rose-breasted Grosbeak, Yellow-billed Cuckoo, and Broad-winged Hawk.

Reptile and amphibian species include ornate box turtle, northern fence lizard, five-lined skink, broad-headed skink, six-lined racerunner, flat-headed snake, rough earth snake, and timber rattlesnake.

Other information

Forestry (NRCS 2002, 2014):

Management: Field measured site index values average 61 for oak . Timber management opportunities are good. Create group openings of at least 2 acres. Large clearcuts should be minimized if possible to reduce impacts on wildlife and aesthetics. Uneven-aged management using single tree selection or small group selection cuttings of ½ to 1 acre are other options that can be used if clear cutting is not desired or warranted. Using prescribed fire as a management tool could have a negative impact on timber quality or should be used with caution on a particular site if timber management is the primary objective.

Limitations: No major equipment restrictions or limitations exist. Erosion is a hazard when slopes exceed 15 percent. On steep slopes greater than 35 percent, traction problems increase and equipment use is not recommended.

Inventory data references

Potential Reference Site: Loamy Exposed Backslope Woodland

Plot CURICA02 – Gravois soil
Located in Current River CA, Reynolds County, MO
Latitude: 37.138311
Longitude: -91.095887

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Contributors

Fred Young
Doug Wallace

Approval

Nels Barrett, 9/24/2020

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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	05/29/2023

Approved by	Nels Barrett
Approval date	
Composition (Indicators 10 and 12) based on	Annual Production

Indicators

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

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

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

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

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

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

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

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

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

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

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

12. **Functional/Structural Groups (list in order of descending dominance by above-ground annual-production or live foliar cover using symbols: >>, >, = to indicate much greater than, greater than, and equal to):**

    Dominant:

Sub-dominant:

Other:

Additional:

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13. **Amount of plant mortality and decadence (include which functional groups are expected to show mortality or decadence):**

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14. **Average percent litter cover (%) and depth (in):**

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15. **Expected annual annual-production (this is TOTAL above-ground annual-production, not just forage annual-production):**

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16. **Potential invasive (including noxious) species (native and non-native). List species which BOTH characterize degraded states and have the potential to become a dominant or co-dominant species on the ecological site if their future establishment and growth is not actively controlled by management interventions. Species that become dominant for only one to several years (e.g., short-term response to drought or wildfire) are not invasive plants. Note that unlike other indicators, we are describing what is NOT expected in the reference state for the ecological site:**

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17. **Perennial plant reproductive capability:**
