USDA Natural Resources Conservation Service

Ecological site F116BY036MO
Interbedded Sedimentary 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): 116B–Springfield Plain

The Springfield Plain is in the western part of the Ozark Uplift. It is primarily a smooth plateau with some dissection along streams. Elevation is about 1,000 feet in the north to over 1,700 feet in the east along the Burlington Escarpment adjacent to the Ozark Highlands. The underlying bedrock is mainly Mississippian-aged limestone, with areas of shale on lower slopes and structural benches, and intermittent Pennsylvanian-aged sandstone deposits on the plateau surface.

Classification relationships

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

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

National Vegetation Classification System Vegetation Association (NatureServe, 2010):
The reference state for this ecological site is most similar to a Quercus stellata - Quercus velutina / Schizachyrium

scoparium Woodland (CEGL005281).

Geographic relationship to the Missouri Ecological Classification System (Nigh & Schroeder, 2002):
This ecological site occurs primarily within the following Land Type Associations:
Little Sac River Oak Savanna/Woodland Low Hills
James River Oak Savanna/Woodland Low Hills

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”.

Interbedded Sedimentary Exposed Backslope Woodlands occur on steep backslopes with southern and western aspects primarily along the northeast edge of the Springfield Plain, typically on lower hillslopes where shale is near the surface. A few areas occur to the south in upper reaches of the Elk River and Roaring River, and along upper reaches of Bull Shoals Lake. This site is mapped in complex with the Interbedded Sedimentary Protected Backslope Forest ecological site. Soils are moderately deep to deep over interbedded shale and mudstone bedrock, and typically have shale and mudstone fragments in clayey subsoils. The reference plant community is woodland with an overstory dominated by post oak and blackjack oak and a ground flora of native grasses and forbs.

Associated sites

F116BY004MO	**Low-Base Chert Upland Woodland** Low-base Chert Upland Woodlands are upslope.
F116BY012MO	**Interbedded Sedimentary Protected Backslope Forest** Interbedded Sedimentary Protected Backslope Forests are mapped in complex with this ecological site, on steep northern and eastern aspects.
F116BY017MO	**Gravelly/Loamy Upland Drainageway Woodland** Gravelly/Loamy Upland Drainageway Woodlands are downslope.

Similar sites

F116BY012MO	**Interbedded Sedimentary Protected Backslope Forest** Interbedded Sedimentary Protected Backslope Forests are mapped in complex with this ecological site, on steep northern and eastern aspects but are more productive.

Table 1. Dominant plant species

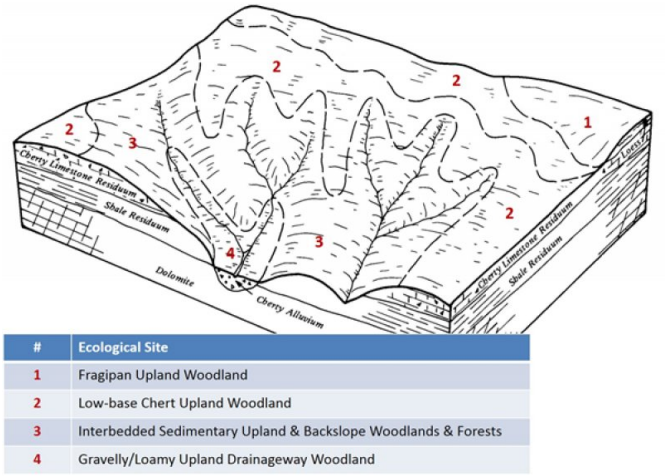
Tree	(1) *Quercus stellata* (2) *Quercus marilandica*
Shrub	(1) *Rhus aromatica*
Herbaceous	(1) *Schizachyrium scoparium* (2) *Helianthus hirsutus*

Physiographic features

This site is on upland backslopes with slopes of 15 to over 50 percent. It is on exposed aspects (south, southwest, and west), which receive significantly more solar radiation than the protected aspects. The site receives runoff from upslope summit and shoulder sites, and generates runoff to adjacent, downslope ecological sites. This site does not flood.

The following figure (adapted from Dodd, 1990) shows the typical landscape position of this ecological site, and landscape relationships with other ecological sites. Interbedded Sedimentary Exposed Backslope Woodland sites are within the area labeled as “3”, and are typically on lower slopes where the shale and mustone crops out downslope from the overlying limestone. Structural benches and upper, less sloping backslopes within this area are

in the Interbedded Sedimentary Upland Woodland ecological sites. Low-base Chert Upland Woodland sites are typically upslope, and areas of Low-base Chert Upland sites are shown on upper slopes within the area labeled as “3”. Several soils are included within the Low-base Chert Upland Woodland area labeled as “2”, as indicated by the dashed line within the delineation.



#	Ecological Site
1	Fragipan Upland Woodland
2	Low-base Chert Upland Woodland
3	Interbedded Sedimentary Upland & Backslope Woodlands & Forests
4	Gravelly/Loamy Upland Drainageway Woodland

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	15–50%
Water table depth	33–99 cm
Aspect	W, S, SW

Climatic features

The Springfield Plain 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 Springfield Plain experiences few regional differences in climates. The average annual precipitation in this area is 41 to 45 inches. Snow falls nearly every winter, but the snow cover lasts for only a few days. The average annual temperature is about 55 to 58 degrees F. The lower temperatures occur at the higher elevations. Mean July maximum temperatures have a range of only one or two degrees across the area.
Mean annual precipitation varies along a west to east 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)	151-162 days
Freeze-free period (characteristic range)	185-192 days
Precipitation total (characteristic range)	1,168-1,194 mm
Frost-free period (actual range)	146-162 days
Freeze-free period (actual range)	182-194 days
Precipitation total (actual range)	1,168-1,194 mm
Frost-free period (average)	156 days
Freeze-free period (average)	188 days
Precipitation total (average)	1,168 mm

Climate stations used

- (1) SPRINGFIELD [USW00013995], Springfield, MO
- (2) STOCKTON DAM [USC00238082], Stockton, MO
- (3) SELIGMAN [USC00237645], Seligman, MO

Influencing water features

This ecological site is not influenced by wetland or riparian water features. This site generates runoff to adjacent, downslope ecological sites. The water features of this upland ecological site include evapotranspiration, surface runoff, and drainage. Each water balance component fluctuates to varying extents from year-to-year. Evapotranspiration remains the most constant. Precipitation and drainage are highly variable between years. Seasonal variability differs for each water component. Precipitation generally occurs as single day events. Evapotranspiration is lowest in the winter and peaks in the summer. Water stored as ice and snow decreases drainage and surface runoff rates throughout the winter and increases these fluxes in the spring. The surface runoff pulse is greatly influenced by extreme events. Conversion to cropland or other high intensities land uses tends to increase runoff, but also decreases evapotranspiration. Depending on the situation, this might increase groundwater discharge, and decrease baseflow in receiving streams.

Soil features

These soils are underlain by interbedded shale, mudstone and limestone bedrock between 40 and 70 inches, although the site definition allows for soils as shallow as 20 inches. The subsoils are not low in bases. The soils were formed under woodland vegetation, and have thin, light-colored surface horizons. Parent material is slope alluvium over residuum derived from siltstone and shale. They have silt loam surface horizons that are often gravelly, and clayey subsoils with varying amounts of shale fragments. These soils are not affected by seasonal wetness. Soil series associated with this site include Alsup and Boskydell.

The accompanying picture of the Alsup series shows a thin gravelly silt loam surface horizon over a yellowish brown, clayey subsoil. The olive yellow colors below about 80 cm in this picture are inherited from the shale parent material. Soft shale is below one meter, at the bottom of this picture. Scale is in centimeters. Picture from Henderson (2004).

Figure 9. Alsup series

Table 4. Representative soil features

Parent material	(1) Residuum–shale and siltstone (2) Slope alluvium
Surface texture	(1) Silt loam (2) Gravelly silt loam (3) Very channery silty clay loam
Family particle size	(1) Clayey
Drainage class	Moderately well drained
Permeability class	Very slow
Soil depth	51–152 cm
Surface fragment cover <=3"	10–20%
Surface fragment cover >3"	0–30%
Available water capacity (0-101.6cm)	5.08–12.7 cm
Calcium carbonate equivalent (0-101.6cm)	0%
Electrical conductivity (0-101.6cm)	0–2 mmhos/cm
Sodium adsorption ratio (0-101.6cm)	0
Soil reaction (1:1 water) (0-101.6cm)	4.5–7.8
Subsurface fragment volume <=3" (Depth not specified)	5–10%
Subsurface fragment volume >3" (Depth not specified)	0–50%

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 woodland dominated by an overstory of post oak, hickory and blackjack oak. The moderately deep soils and dry aspects of Interbedded Sedimentary Exposed Backslope Woodlands limit the growth of trees but support an abundance of native grasses and forbs in the understory. Historically, fire tolerant post oak along with blackjack oak and hickory dominated an open canopy. Woodlands are distinguished from forest, by their relatively open understory, and the presence of sun-loving ground flora species.

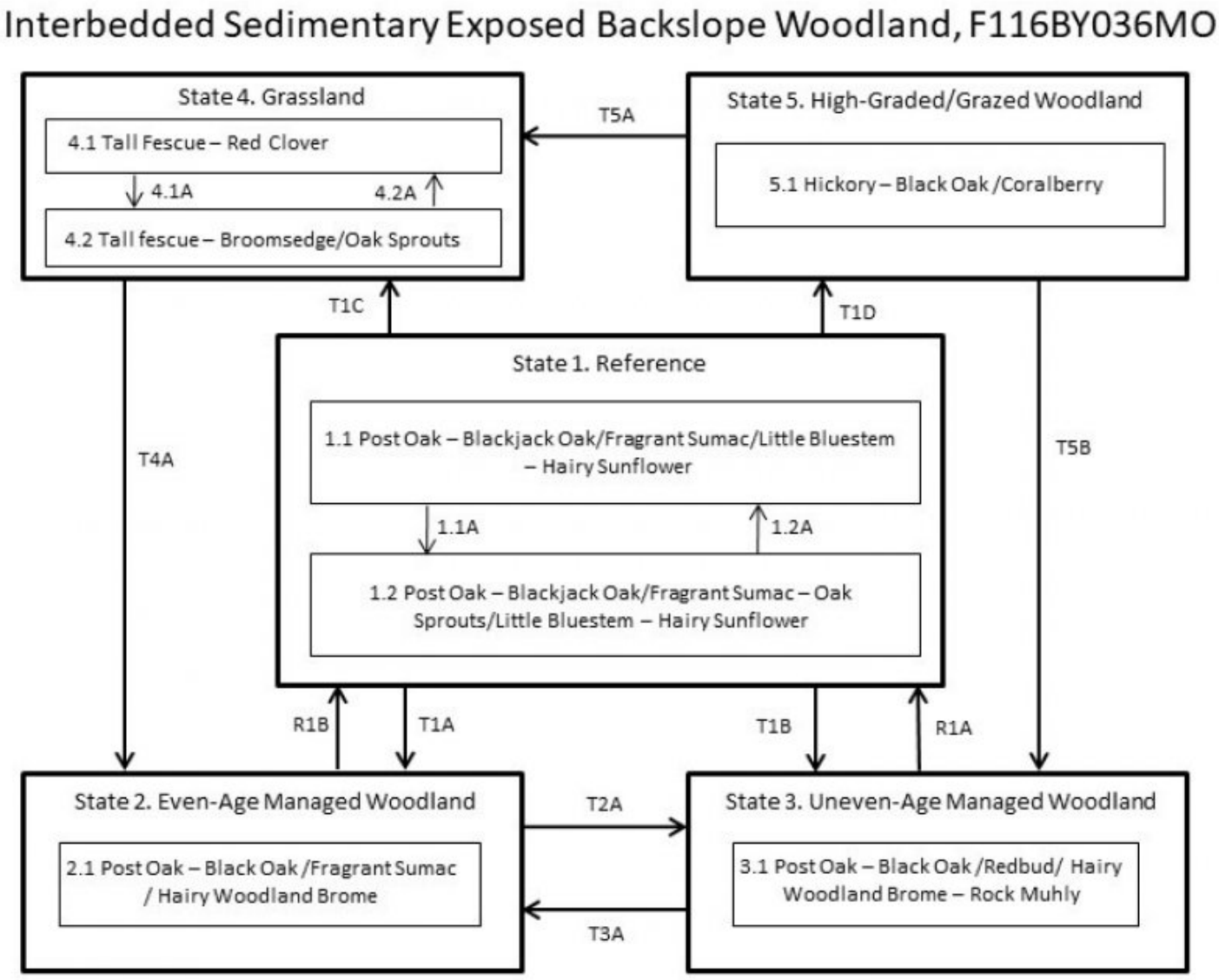
Fire played an important role in the maintenance of these sites. It is likely that these ecological sites burned at least once every 5 years. These periodic fires kept woodlands open, removed the litter, and stimulated the growth and flowering of the grasses and forbs. During fire free intervals, woody understory species increased and the herbaceous understory diminished. The return of fire would open the woodlands up again and stimulate the abundant ground flora. In the long term absence of fire, woody species, such as eastern redcedar, hickory, and black oak encroach into these woodlands. Once established, these woody plants can quickly fill the existing understory increasing shade levels, greatly diminishing ground flora. Opening the canopy, removing the younger understory and applying 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 related to grazing can be a problem and lower site productivity.

Managed areas show an exceptional resiliency with the removal of the younger understory by thinning and the application of prescribed fire. Characteristic ground flora (see understory list) can be used to gauge the restoration potential of a stand along with remnant open-grown old-age trees, and tree height growth. This type of management can provide limited timber products, wildlife habitat, and potential native forage.

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; fire suppression
T1B	Uneven-age management; fire suppression
T1C, T5A	Clearing; grassland planting; grassland management
T1D	High-grade harvesting; uncontrolled grazing
T2A	Uneven-age management
T3A	Even-age management
T4A	Tree planting; long-term succession; no grazing
T5B	Uneven-age management; tree planting; no grazing

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

Code	Activity/Event/Process
R1A, R1B	Extended rotations; forest stand improvement; prescribed fire

Figure 10. State and transition diagram for this ecological site

State 1

Reference

The reference state was dominated by post oak and black oak. Periodic disturbances from fire, wind and ice maintained the dominance of oak species by opening up the canopy and allowing more light for oak reproduction. Long disturbance-free periods allowed an increase in more shade tolerant species such as hickory. Two community phases are recognized in this state, with shifts between phases based on disturbance frequency. The reference state is rare today. Some 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 also resulted in increased canopy density, which has affected the abundance and diversity of ground flora. Many reference sites have been managed for timber harvest, resulting in either even-age (State 2) or uneven-age (State 3) woodlands.

Community 1.1
Post Oak – Blackjack Oak/Fragrant Sumac/Little Bluestem – Hairy Sunflower

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
Post Oak – Blackjack Oak/Fragrant Sumac – Oak Sprouts/Little Bluestem – Hairy Sunflower

Pathway P.1A
Community 1.1 to 1.2

No disturbances (10+ years)

Pathway P1.2A
Community 1.2 to 1.1

Disturbances (fire, wind, ice) < 10 years

State 2
Even-Age Managed Woodland

These woodlands tend to be rather dense, with an under developed understory and ground flora. Thinning can increase overall tree vigor and improve understory diversity. Continual timber management, depending on the practices used, will either maintain this state, or convert the site to Uneven-age Woodland (state 3).

Dominant resource concerns

- Plant structure and composition

- Wildfire hazard from biomass accumulation
- Terrestrial habitat for wildlife and invertebrates

Community 2.1
Post Oak – Black Oak /Fragrant Sumac / Woodland Brome

State 3
Uneven-Age Managed Woodland

Composition and tree age (most being only 50 to 90 years old) are likely altered from the reference state depending on tree selection during harvest. In addition, without a regular 15 to 20 year harvest re-entry into these stands, they will slowly increase in more shade tolerant species will become less dominant.

Dominant resource concerns

- Plant structure and composition
- Wildfire hazard from biomass accumulation
- Terrestrial habitat for wildlife and invertebrates

Community 3.1
Post Oak – Black Oak /Red Bud/ Woodland Brome – Muly Grass

State 4
Grassland

Conversion of woodlands to planted, non-native pasture species such as tall fescue has been common. Steep slopes, surface fragments and low organic matter content make non-native pastures challenging to maintain in a healthy, productive state on this ecological site. If grazing and active pasture management is discontinued, the site will eventually transition, over time, to State 2 (Even-Age Managed Woodland).

Community 4.1
Tall Fescue - Red Clover

This herbaceous community is typically dominated by tall fescue and red clover. Various other grass and forb species are typically present, in various amounts. Shrub and pioneer tree species such as eastern redcedar and hickory and oak typically invade sites that are not regularly managed.

Dominant resource concerns

- Plant structure and composition
- Terrestrial habitat for wildlife and invertebrates

Community 4.2
Tall fescue - Broomsedge/Oak Sprouts

Dominant resource concerns

- Ephemeral gully erosion
- Nutrients transported to surface water
- Plant productivity and health
- Plant structure and composition
- Plant pest pressure
- Terrestrial habitat for wildlife and invertebrates
- Feed and forage imbalance

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

Wooded sites subjected to repeated, high-graded timber harvests and uncontrolled domestic grazing transition to this 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 vegetation offers little nutritional value for cattle, and excessive stocking damages tree boles, degrades understory species composition and results in soil compaction and accelerated erosion and runoff. Exclusion of livestock from sites in this state coupled with uneven-age management techniques will cause a transition to State 3 (Uneven-Age).

Dominant resource concerns

- Ephemeral gully erosion
- Nutrients transported to surface water
- Plant productivity and health
- Plant structure and composition
- Plant pest pressure
- Wildfire hazard from biomass accumulation
- Terrestrial habitat for wildlife and invertebrates

Community 5.1
Hickory – Black Oak / Buckbrush

Transition T1A
State 1 to 2

This transition typically results from even-age timber management practices, such as clear-cut, seed tree or shelterwood harvest and fire suppression.

Transition T1B
State 1 to 3

This transition typically results from uneven-age timber management practices, such as single tree or group selection harvest and fire suppression.

Transition T1C
State 1 to 4

Clearing; grassland planting; grassland management

Transition T1D
State 1 to 5

This transition is the result of clearing the woodland community and planting pasture species. Soil erosion can be extensive in this process, along with loss of organic matter. Liming and fertilizing associated with pasture management typically raises the soil pH and increases the cation concentration (such as calcium and magnesium) of the upper soil horizons.

Restoration pathway R1B

State 2 to 1

Extended rotations; forest stand improvement; prescribed fire

Transition T2A
State 2 to 3

This transition typically results from uneven-age forest management practices, such as single tree or group selection harvest.

Restoration pathway R1A
State 3 to 1

Extended rotations; forest stand improvement; prescribed fire

Transition T3A
State 3 to 2

This transition typically results from even-age forest management practices, such as clear-cut, seed tree or shelterwood harvest.

Transition T4A
State 4 to 2

This transition typically results from even-age timber management practices, such as clear-cut, seed tree or shelterwood harvest.

Transition T5B
State 5 to 3

Uneven-age management; tree planting; no grazing; forest stand improvement

Transition T5A
State 5 to 4

Clearing; grassland planting; grassland management

Additional community tables

Table 5. Community 1.1 forest overstory composition

Common Name	Symbol	Scientific Name	Nativity	Height (M)	Canopy Cover (%)	Diameter (Cm)	Basal Area (Square M/Hectare)
Tree							
post oak	QUST	*Quercus stellata*	Native	–	10–20	–	–
black oak	QUVE	*Quercus velutina*	Native	–	10–20	–	–
blackjack oak	QUMA3	*Quercus marilandica*	Native	–	10–20	–	–
black hickory	CATE9	*Carya texana*	Native	–	10–20	–	–
shagbark hickory	CAOV2	*Carya ovata*	Native	–	5–20	–	–
shortleaf pine	PIEC2	*Pinus echinata*	Native	–	0–10	–	–
white oak	QUAL	*Quercus alba*	Native	–	5–10	–	–

Table 6. Community 1.1 forest understory composition

Common Name	Symbol	Scientific Name	Nativity	Height (M)	Canopy Cover (%)

Grass/grass-like (Graminoids)					
hairy woodland brome	BRPU6	*Bromus pubescens*	Native	–	5–20
sideoats grama	BOCU	*Bouteloua curtipendula*	Native	–	5–20
little bluestem	SCSC	*Schizachyrium scoparium*	Native	–	5–20
big bluestem	ANGE	*Andropogon gerardii*	Native	–	5–20
Pennsylvania sedge	CAPE6	*Carex pensylvanica*	Native	–	5–20
blue sedge	CAGL6	*Carex glaucodea*	Native	–	5–20
fuzzy wuzzy sedge	CAHI6	*Carex hirsutella*	Native	–	5–20
parasol sedge	CAUM4	*Carex umbellata*	Native	–	5–20
oval-leaf sedge	CACE	*Carex cephalophora*	Native	–	5–20
variable panicgrass	DICO2	*Dichanthelium commutatum*	Native	–	5–20
slimleaf panicgrass	DILI2	*Dichanthelium linearifolium*	Native	–	5–20
Bosc's panicgrass	DIBO2	*Dichanthelium boscii*	Native	–	5–20
Virginia wildrye	ELVI3	*Elymus virginicus*	Native	–	5–20
eastern bottlebrush grass	ELHY	*Elymus hystrix*	Native	–	5–20
prairie dropseed	SPHE	*Sporobolus heterolepis*	Native	–	5–20
poverty oatgrass	DASP2	*Danthonia spicata*	Native	–	5–20
rock muhly	MUSO	*Muhlenbergia sobolifera*	Native	–	1–10
Forb/Herb					
pointedleaf ticktrefoil	DEGL5	*Desmodium glutinosum*	Native	–	1–10
smooth small-leaf ticktrefoil	DEMA2	*Desmodium marilandicum*	Native	–	1–10
eastern purple coneflower	ECPU	*Echinacea purpurea*	Native	–	1–10
butterfly milkweed	ASTU	*Asclepias tuberosa*	Native	–	1–10
nakedflower ticktrefoil	DENU4	*Desmodium nudiflorum*	Native	–	1–10
Arkansas bedstraw	GAAR4	*Galium arkansanum*	Native	–	1–10
American ipecac	GIST5	*Gillenia stipulata*	Native	–	1–10
hairy sunflower	HEHI2	*Helianthus hirsutus*	Native	–	1–10
eastern beebalm	MOBR2	*Monarda bradburiana*	Native	–	1–10
bristly buttercup	RAHI	*Ranunculus hispidus*	Native	–	1–10
slimflower scurfpea	PSTE5	*Psoralidium tenuiflorum*	Native	–	1–10
fire pink	SIVI4	*Silene virginica*	Native	–	1–10
elmleaf goldenrod	SOUL2	*Solidago ulmifolia*	Native	–	1–10
manyray aster	SYAN2	*Symphyotrichum anomalum*	Native	–	1–10
woman's tobacco	ANPL	*Antennaria plantaginifolia*	Native	–	1–10
fire pink	SIVI4	*Silene virginica*	Native	–	1–10
smooth small-leaf ticktrefoil	DEMA2	*Desmodium marilandicum*	Native	–	1–10
pointedleaf ticktrefoil	DEGL5	*Desmodium glutinosum*	Native	–	1–10
American lopseed	PHLE5	*Phryma leptostachya*	Native	–	1–10
bearded shorthusk	BRER2	*Brachyelytrum erectum*	Native	–	1–10
flowering spurge	EUCO10	*Euphorbia corollata*	Native	–	1–10
button eryngo	ERYU	*Eryngium yuccifolium*	Native	–	1–10
Virginia tephrosia	TEVI	*Tephrosia virginiana*	Native	–	1–10
fringeleaf wild petunia	RUHU	*Ruellia humilis*	Native	–	1–10
Shrub/Subshrub					

Shrub/Subshrub					
St. Andrew's cross	HYHY	*Hypericum hypericoides*	Native	–	5–10
leadplant	AMCA6	*Amorpha canescens*	Native	–	5–10
Carolina rose	ROCA4	*Rosa carolina*	Native	–	5–10
fragrant sumac	RHAR4	*Rhus aromatica*	Native	–	5–10
American hazelnut	COAM3	*Corylus americana*	Native	–	5–10
New Jersey tea	CEAM	*Ceanothus americanus*	Native	–	5–10

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

Sedges and native cool-season grasses provide green browse; patchy 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 Dry Oak Woodlands are Indigo Bunting, Red-headed Woodpecker, Eastern Bluebird, Northern Bobwhite, Summer Tanager, Eastern Wood-Pewee, Whip-poor-will, Chuck-will’s widow, and Red-eyed Vireo.

Reptiles and amphibians associated with Dry Oak Woodlands include ornate box turtle, northern fence lizard, five-lined skink, coal skink, broad-headed skink, six-lined racerunner, western slender glass lizard, prairie ring-necked snake, flat-headed snake, rough earth snake, red milk snake, western pygmy rattlesnake, and timber rattlesnake.

Other information

Forestry (NRCS 2002; 2014)
Management: Field measured site index values average 51 for post oak and 50 for black oak. 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. Prescribed fire is an effective management tool for this site.

Limitations: Coarse fragments throughout profile; bedrock may be within 60 inches. Surface stones and rocks are problems for efficient and safe equipment operation and will make equipment use somewhat difficult. Disturbing the surface excessively in harvesting operations and building roads increases soil losses, which leaves a greater amount of coarse fragments on the surface. Hand planting or direct seeding may be necessary. Seedling mortality due to low available water capacity may be high. Mulching or providing shade can improve seedling survival. Mechanical tree planting will be limited. 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 Sites: Interbedded Sedimentary Exposed Backslope Woodland

Plot PLHOCA05 – Alsup soil
Located in Pleasant Hope CA, Polk County, MO
Latitude: 37.431014
Longitude: -93.297112

Plot LISACA01 – Alsup soil
Located in Little Sac Woods CA, Greene County, MO
Latitude: 37.38936
Longitude: -93.389519

Plot PLHOCA01 – Alsup soil
Located in Pleasant Hope CA, Polk County, MO
Latitude: 37.430912
Longitude: -93.296966

Plot RORISP05 – Boskydell
Located in Roaring River SP, Barry County, MO
Latitude: 36.593329
Longitude: -93.844319

Plot SARCA01 – Alsup
Located in Sare CA, Greene County, MO
Latitude: 37.368021
Longitude: -93.323176

Plot FLSPCA02 – Boskydell
Located in Flag Spring CA, Barry County, MO
Latitude: 36.593829
Longitude: -94.032247

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Contributors

Fred Young
Doug Wallace

Approval

Nels Barrett, 10/07/2020

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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	09/30/2020
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):**

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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:

---

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):**

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:**