USDA Natural Resources
Conservation Service

Ecological site R116AY006MO
Loamy Upland Prairie

Last updated: 9/24/2020
Accessed: 05/11/2025

General information

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

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 Limestone/Dolomite Prairie.

National Vegetation Classification System Vegetation Association (NatureServe, 2010):
The reference state for this ecological site is most similar to Andropogon gerardii - Sorghastrum nutans Unglaciated Herbaceous Vegetation (CEGL002204).

Geographic relationship to the Missouri Ecological Classification System (Nigh & Schroeder, 2002):
This ecological site occurs primarily in the Prairie 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”.

Loamy Upland Prairie occur primarily in the northwest part of the Ozark Highland. Soils are very deep, and are silt loam loess overlying loamy or clayey, gravelly residuum. The reference plant community is prairie dominated by little bluestem, big bluestem, Indiangrass, prairie dropseed and a wide variety of prairie wildflowers.

Associated sites

R116AY001MO	**Claypan Summit Prairie** Claypan Summit Prairies are adjacent and upslope, on broad, level summits.
R116AY005MO	**Wet Footslope Savanna** Wet Footslope Savannas are downslope.

Similar sites

R116AY001MO	**Claypan Summit Prairie** Claypan Summit Prairies are adjacent and upslope, on broad, level summits.

Table 1. Dominant plant species

Tree	Not specified
Shrub	(1) *Amorpha canescens* (2) *Ceanothus americanus*
Herbaceous	(1) *Schizachyrium scoparium* (2) *Andropogon gerardii*

Physiographic features

This site is on upland summit interfluves, crests and shoulders with slopes of 1 to 15 percent. The site generates runoff to adjacent, downslope ecological sites. This site does not flood.

The following figure (adapted from Wolf, 2003) 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. The dashed lines within the area indicate the various soils included in this ecological site. Loamy Upland Prairie sites are typically downslope from Claypan Summit Prairie sites, labeled “1”.

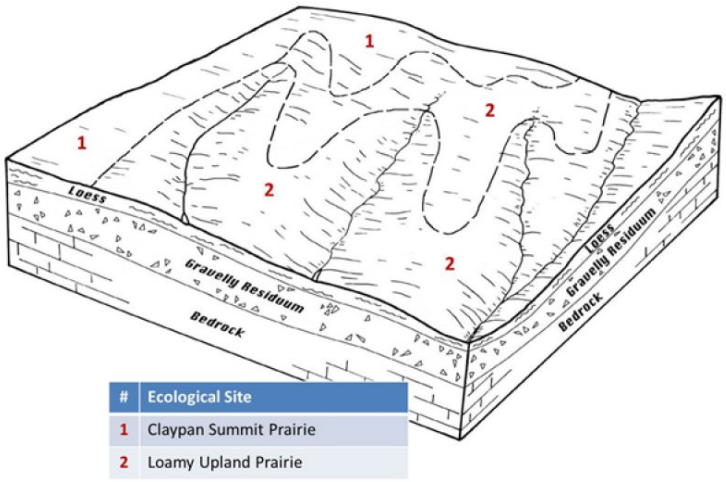


Figure 2. Landscape relationships for this ecological site.

Table 2. Representative physiographic features

Landforms	(1) Ridge (2) Interfluve (3) Hillslope
Flooding frequency	None
Ponding frequency	None
Slope	1–15%
Water table depth	18–57 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)	146-162 days
Freeze-free period (characteristic range)	178-191 days
Precipitation total (characteristic range)	44-45 in
Frost-free period (actual range)	143-167 days
Freeze-free period (actual range)	176-196 days
Precipitation total (actual range)	44-45 in
Frost-free period (average)	154 days
Freeze-free period (average)	185 days
Precipitation total (average)	44 in

Climate stations used

- (1) SEDALIA WTP [USC00237632], Sedalia, MO
- (2) VERSAILLES 2W [USC00238603], Versailles, MO
- (3) CALIFORNIA [USC00231189], California, MO

Influencing water features

Some areas of this ecological site are influenced by a seasonal high water table, perched on the subsoil or on underlying till or residuum. Seeps may occur in headslope positions, particularly in the spring and following heavy rainfall events. These seeps are source areas for first-order ephemeral streams, typically within Upland Drainageway ecological sites downslope. Where present, these headslope seeps are in the SLOPE wetlands class of the Hydrogeomorphic (HGM) classification system (Brinson, 1993).

Soil features

These soils have no major rooting restriction, although a dense subsoil layer impedes root penetration and water movement. The soils were formed under prairie vegetation, and have dark, organic-rich surface horizons. Parent material is loess over residuum derived from limestone and dolomite. They have silt loam surface horizons, with loamy subsoils that are gravelly to very gravelly with depth. Some of these soils are slightly affected by a seasonal high water table perched on the dense subsoil layer during the spring months in most years. Soil series associated with this site include Bahner, Bunceton, Clafork, Friendly, Maplewood, Paintbrush, Sacville, and Sedalia.

The accompanying picture of the Paintbrush series shows a dark silt loam surface horizon over a brown silty clay loam subsoil, underlain by very gravelly clay. Picture from Gregg and Woodward (2006).

Figure 9. Paintbrush series

Table 4. Representative soil features

Parent material	(1) Loess (2) Residuum–limestone and dolomite
Surface texture	(1) Gravelly silt loam (2) Very gravelly
Family particle size	(1) Clayey
Drainage class	Somewhat poorly drained to well drained
Permeability class	Very slow
Soil depth	72 in
Surface fragment cover <=3"	0%
Surface fragment cover >3"	0%
Available water capacity (0-40in)	5–7 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)	6–50%
Subsurface fragment volume >3" (Depth not specified)	5–15%

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.

Loamy Upland Prairies are characterized as a tallgrass prairie unit dominated by little and big bluestem, Indian grass, prairie dropseed, and a wide variety of prairie wildflowers. In some cases, bur oak, post oak, American hazelnut, prairie willow and American plum occurred in small groves or as scattered individuals across the prairie landscape. On lower slopes and draws where water balances are enhanced, more mesic prairie species such as switchgrass, eastern gamagrass, Culver's root, Michigan lily, and Virginia bunchflower are added to the diverse mix of prairie species.

With little to interrupt fire, this ecological site burned every 1 to 3 years. Fire removed dead plant litter and provided room for a lush growth of prairie vegetation. Fire also kept woody species at bay. Grazing by native large herbivores, such as bison, elk, and deer, also impacted these sites. Their activities altered the composition, fuel loads and structure of the vegetation, creating a diversity of structure and composition. The partially wooded draws would have burned less intensely and less frequently. During fire free intervals woody species would have increased in abundance and spread out onto the prairie.

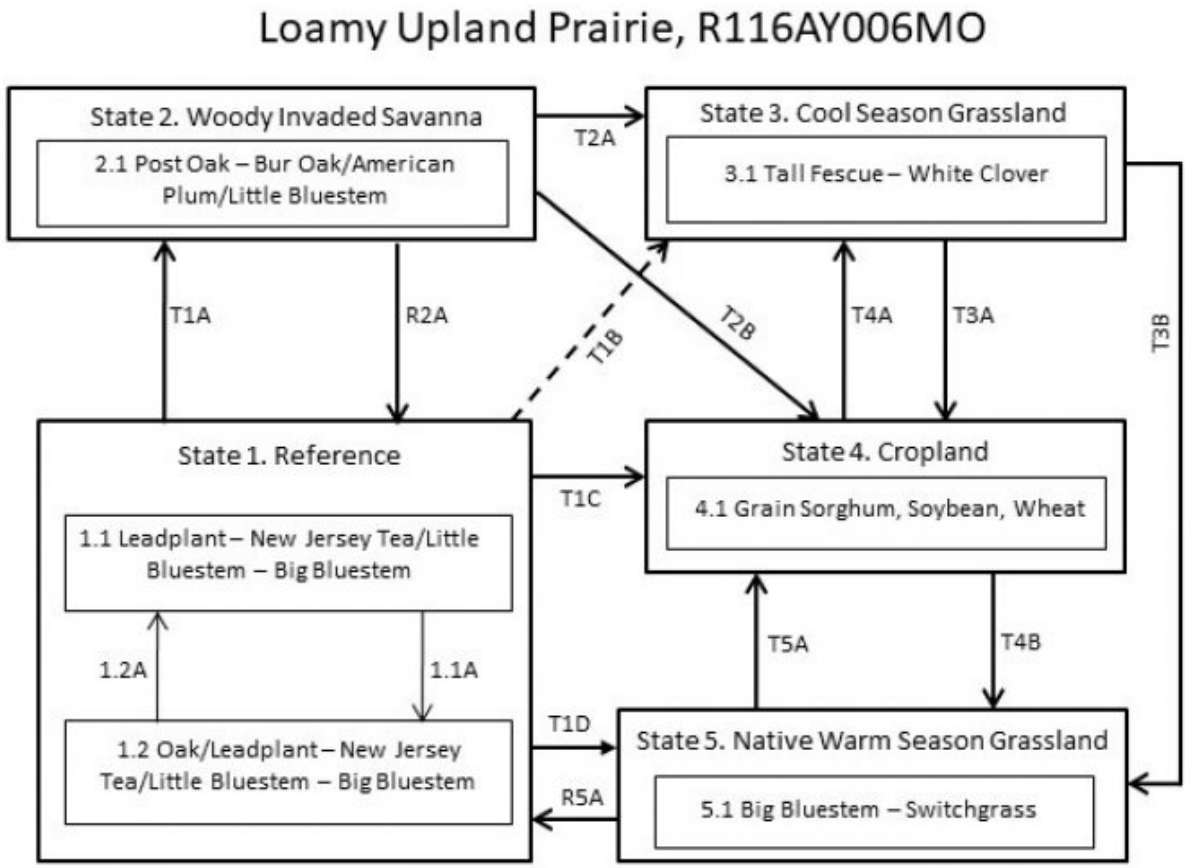
Today, Loamy Upland Prairies are nearly extirpated from the region as the former prairies have been converted to pasture or cropland. The remaining known remnants are degraded by fire suppression and grazing by domestic livestock. Many of the forbs are very palatable and readily grazed by livestock. These palatable forbs decrease with even moderate continuous grazing, but composition can be maintained using prescribed grazing. Forbs that increase include heathaster, tall goldenrod, Missouri goldenrod, western ragweed and Louisiana sagewort. Woody plants such as buckbrush, blackberry and sumac also increase with continuous overgrazing and the the absence of fire on site.

The absence of both grazing and fire will encourage a gradual increase of mulch and litter. Heavy accumulations of mulch and litter will negatively affect vegetation growth. Herbage production will be reduced. Bunchgrasses, especially little bluestem, are usually reduced. Heavy mulch accumulation also accommodates the encroachment of woody plant species such as buckbrush, blackberry, roughleaf dogwood, sumac, elm, persimmon, hawthorn and hackberry.

However, when properly managed, including the reintroduction of fire, existing remnants of Loamy Upland Prairies show great resiliency and the stand composition can be improved and maintained indefinitely.

A state-and-transition model 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 may change as knowledge increases.

State and transition model



Code	Event/Activity/Process
T1A	Fire suppression > 20 years; woody invasion
T1B	Tillage; vegetative seeding; grassland management
T1C, T3A, T5A	Tillage; conservation cropping system
T1D	Prescribed grazing; prescribed fire
T2A	Woody removal; tillage; vegetative seeding; grassland management
T2B	Woody removal; tillage; conservation cropping system
T4A	Vegetative seeding ; grassland management
T3B, T4B	Vegetative seeding; prescribed fire; grassland management
1.1A	Fire-free interval 10+ years
1.2A	Fire interval 1-3 years
R2A	Woody removal; prescribed fire 1-3 years
R5A	Vegetative seeding; prescribed fire 1-3 years

Figure 10. State and transition diagram for this ecological site.

State 1

Reference

This state is native tall grass prairie dominated by little bluestem, big bluestem and forbs. This state occurs on gently sloping soils that may have a seasonal high water table perched above an abrupt textural change or clayey subsoil during the spring months in many years. Two phases can occur that will transition back and forth depending on fire frequencies. Longer fire free intervals will allow woody species to increase such as gray dogwood and oak saplings. When fire intervals shorten these woody species will decrease. This state is extremely rare. Nearly all remaining sites have been converted to cool season grassland, cropland, or have been degraded through uncontrolled domestic livestock grazing

Community 1.1
Leadplant – New Jersey Tea/Little Bluestem – Big Bluestem

Figure 11. Reference state at Hite Prairie Conservation Area, Morgan County, Missouri; photo credit MDC.

Two phases can occur that will transition back and forth depending on fire frequencies. Longer fire free intervals will allow woody species to increase such as gray dogwood and oak saplings. When fire intervals shorten these woody species will decrease.

Forest overstory. Overstory canopy consisted of widely scattered oaks and were generally less than 5 percent cover.

Forest understory. 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
Oak/Leadplant – New Jersey Tea/Little Bluestem – Big Bluestem

Two phases can occur that will transition back and forth depending on fire frequencies. Longer fire free intervals will allow woody species to increase such as gray dogwood and oak saplings. When fire intervals shorten these woody species will decrease.

Forest overstory. Overstory canopy consisted of widely scattered oaks and were generally less than 5 percent cover.

Pathway P1.1A
Community 1.1 to 1.2

This pathway results from fire suppression. With fire-free intervals of 10 to 20 years, woody species will increase in density and cover causing the community to gradually shift to phase 1.2. Some displacement of grasses and forbs may be occurring due to shading, competition from the increased densities of shrubs, and increased thatch build up.

Pathway P1.2A

Community 1.2 to 1.1

With increased fire frequencies, woody species will decrease in density and cover and over time this community will gradually shift back to community phase 1.1. Production levels will generally increase.

State 2
Woody Invaded Savanna

Degraded reference states that have experienced fire suppression for 20 or more years will transition to this state. With fire suppression, woody species such as bur oak and post oak will begin to dominate transitioning this state from a prairie to a Woody Invaded Savanna. Native ground cover will also decrease and invasive species such as tall fescue may begin to dominate. Transition to cool season grasslands (State 3) or intensive cropland (State 4) is very common.

Community 2.1
Post Oak – Bur Oak/American Plum/Little Bluestem

State 3
Cool Season Grassland

Conversion of other states to non-native cool season species such as tall fescue and white clover has been common. Occasionally, these pastures will have scattered post 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.

Community 3.1
Tall Fescue – White Clover

State 4
Cropland

This is the dominant state that exists currently with intensive cropping of grain sorghum, soybeans, and wheat occurring. Some conversion to cool season grassland occurs for a limited period of time before transitioning back to cropland. Limited acres are sometimes converted to native warm season grassland.

Community 4.1
Grain Sorghum, Soybean, Wheat

State 5
Native Warm Season Grassland

Conversion from the Cool Season Grassland (State 3) or the Cropland (State 4) to this state is increasing due to renewed interest in warm season grasses as a supplement to cool season grazing systems or as a native restoration activity. This state is the most easily transformable state back to a reference state. Substantial restoration time and management inputs will be needed.

Community 5.1
Big Bluestem – Switchgrass

Transition T1A
State 1 to 2

Fire suppression activities for greater than 20 years and woody invasion will result in a transition to community phase 2.1.

Transition T1B

State 1 to 3

Destroying the prairie sod with tillage, adding a cool season grass/legume vegetative seeding and grassland management will result in a transition to community phase 3.1.

Transition T1C
State 1 to 4

Removing the prairie sod with tillage and adding a conservation cropping system and surface drainage will result in a transition to community phase 4.1.

Transition T1D
State 1 to 5

Transition activities include prescribed grazing; prescribed fire

Restoration pathway R2A
State 2 to 1

This state can be restored to a reference state with woody removal, brush management, planting additional native grass and forb species (if needed) and initiating a prescribed fire regime (every 1 to 3 years). Limited controlled grazing may also be needed.

Transition T2A
State 2 to 3

Woody removal, brush control, removing the prairie sod with tillage seeding cool season grass and legume species and incorporating grassland management will result in a transition to community phase 3.1.

Transition T2B
State 2 to 4

Woody removal, brush control, removing the prairie sod with tillage and incorporating conservation cropping system and surface drainage will result in a transition to community phase 4.1.

Transition T3A
State 3 to 4

Removing the cool season sod with tillage and adding a conservation cropping system and surface drainage will result in a transition to community phase 4.1.

Transition T3B
State 3 to 5

Killing the existing cool season sod, reseeding to native warm season grasses and adding prescribed fire will result in a transition to community phase 5.1.

Restoration pathway T4A
State 4 to 3

A seeding of cool season grasses and legumes and grassland management will result in a transition to community 3.1.

Transition T4B
State 4 to 5

A seeding of native warm season grasses and grassland management will result in a transition to community 3.1.

Prescribed fire is added in many cases.

Restoration pathway R5A
State 5 to 1

This state can be restored to a reference state by planting additional native grass and forb species and initiating or maintaining a prescribe fire regime (every 1 to 3 years). Limited controlled grazing may also be needed.

Transition T5A
State 5 to 4

Removing the warm season grass sod, adding seasonal tillage, surface drainage and a conservation cropping system will result in a transition to community 3.1.

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							
post oak	QUST	*Quercus stellata*	Native	–	–	–	–
chinquapin oak	QUMU	*Quercus muehlenbergii*	Native	–	–	–	–
bur oak	QUMA2	*Quercus macrocarpa*	Native	–	–	–	–

Table 6. Community 1.1 forest understory composition

Common Name	Symbol	Scientific Name	Nativity	Height (Ft)	Canopy Cover (%)
Grass/grass-like (Graminoids)					
prairie dropseed	SPHE	*Sporobolus heterolepis*	Native	–	–
big bluestem	ANGE	*Andropogon gerardii*	Native	–	–
Indiangrass	SONU2	*Sorghastrum nutans*	Native	–	–
little bluestem	SCSC	*Schizachyrium scoparium*	Native	–	–
eastern gamagrass	TRDA3	*Tripsacum dactyloides*	Native	–	–
marsh bristlegrass	SEPA10	*Setaria parviflora*	Native	–	–
cypress panicgrass	DIDI6	*Dichanthelium dichotomum*	Native	–	–
porcupinegrass	HESP11	*Hesperostipa spartea*	Native	–	–
sideoats grama	BOCU	*Bouteloua curtipendula*	Native	–	–
switchgrass	PAVI2	*Panicum virgatum*	Native	–	–
Forb/Herb					
ashy sunflower	HEMO2	*Helianthus mollis*	Native	–	–
wild quinine	PAIN3	*Parthenium integrifolium*	Native	–	–
narrowleaf mountainmint	PYTE	*Pycnanthemum tenuifolium*	Native	–	–
Virginia strawberry	FRVI	*Fragaria virginiana*	Native	–	–
common cinquefoil	POSI2	*Potentilla simplex*	Native	–	–
panicledleaf ticktrefoil	DEPA6	*Desmodium paniculatum*	Native	–	–
sessileleaf ticktrefoil	DESE	*Desmodium sessilifolium*	Native	–	–
button eryngo	ERYU	*Eryngium yuccifolium*	Native	–	–
Nuttall's sensitive-briar	MINU6	*Mimosa nuttallii*	Native	–	–
Baldwin's ironweed	VEBA	*Vernonia baldwinii*	Native	–	–

Texas goldentop	EUGY	*Euthamia gymnospermoides*	Native	–	–
pride of Ohio	DOME	*Dodecatheon meadia*	Native	–	–
bluejacket	TROH	*Tradescantia ohiensis*	Native	–	–
green comet milkweed	ASVI	*Asclepias viridiflora*	Native	–	–
longbract wild indigo	BABR2	*Baptisia bracteata*	Native	–	–
prairie milkweed	ASSU3	*Asclepias sullivantii*	Native	–	–
white wild indigo	BAAL	*Baptisia alba*	Native	–	–
prairie blazing star	LIPY	*Liatris pycnostachya*	Native	–	–
purple milkwort	POSA3	*Polygala sanguinea*	Native	–	–
whorled milkwort	POVE	*Polygala verticillata*	Native	–	–
butterfly milkweed	ASTU	*Asclepias tuberosa*	Native	–	–
Missouri goldenrod	SOMI2	*Solidago missouriensis*	Native	–	–
wholeleaf rosinweed	SIIN2	*Silphium integrifolium*	Native	–	–
scarlet Indian paintbrush	CACO17	*Castilleja coccinea*	Native	–	–
Culver's root	VEVI4	*Veronicastrum virginicum*	Native	–	–
Virginia bunchflower	VEVI5	*Veratrum virginicum*	Native	–	–
Shrub/Subshrub					
Carolina rose	ROCA4	*Rosa carolina*	Native	–	–
leadplant	AMCA6	*Amorpha canescens*	Native	–	–
Illinois bundleflower	DEIL	*Desmanthus illinoensis*	Native	–	–
New Jersey tea	CEAM	*Ceanothus americanus*	Native	–	–

Animal community

Wildlife*

Game species that utilize this ecological site include:
Northern Bobwhite will utilize this ecological site for food (seeds, insects) and cover needs (escape, nesting and roosting cover).

Cottontail rabbits will utilize this ecological site for food (seeds, soft mast) and cover needs.

Turkey will utilize this ecological site for food (seeds, green browse, soft mast, insects) and nesting and brood-rearing cover. Turkey poults feed heavily on insects provided by this site type.

White-tailed deer will utilize this ecological site for browse (plant leaves in the growing season, seeds and soft mast in the fall/winter). This site type also can provide escape cover.

Bird species associated with this ecological site's reference state condition:
Breeding birds as related to vegetation structure (related to time since fire, grazing, haying, and mowing):

Vegetation Height Short (0.5 meter, low litter levels, bare ground visible):
Grasshopper Sparrow, Horned Lark, Northern Bobwhite

Vegetation Height Moderate (0.5 – 1 meter, moderate litter levels, some bare ground visible): Eastern Meadowlark, Dickcissel, Field Sparrow, Northern Bobwhite, Blue Grosbeak, Scissor-Tailed Flycatcher, Eastern Kingbird

Vegetation Height Tall (> 1 meter, moderate-high litter levels, little bare ground visible):
Henslow's Sparrow, Dickcissel, Field Sparrow, Northern Bobwhite

Brushy – Mix of grasses, forbs, native shrubs (e.g., Rhus copallina, Prunus americana), native vines (Rubus spp.,

Rosa carolina) and small trees (e.g., Cornus racemosa):
Bell's Vireo, Yellow-Breasted Chat, Loggerhead Shrike, Brown Thrasher, Common Yellowthroat

Amphibian and reptile species associated with this ecological site's reference state condition: Ornate Box Turtle (Terrapene ornata ornata), Western Slender Glass Lizard (Ophisaurus attenuatus attenuatus), Prairie Ring-necked Snake (Diadophis punctatus arnyi), Prairie Kingsnake (Lampropeltis calligaster calligaster), and Bullsnake (Pituophis catenifer sayi).

Prairies with ephemeral vernal fishless wetlands: Western Chorus Frog (Pseudacris triseriata triseriata) and Eastern Tiger Salamander (Ambystoma tigrinum).

Small mammals associated with this ecological site's reference state condition:
Least Shrew (Cryptotis parva), Plains Pocket Gopher (Geomys bursarius), Prairie Vole (Microtus ochrogaster), Meadow Jumping Mouse (Zapus hudsonius), and Badger (Taxidea taxus).

Many native insect species are likely associated with this ecological site, especially native bees, ants, beetles, butterflies and moths, and crickets, grasshoppers and katydids. However information on these groups is often lacking enough resolution to assign them to individual ecological sites.

Insect species known to be associated with this ecological site's reference state condition: Mottled Dusky Wing butterfly (Erynnis martialis), Golden Byssus butterfly (Problema byssus kumskaka), Delaware Skipper butterfly (Atryone logan logan), and Crossline Skipper butterfly (Polites origenes). The larvae of the moth Eucosma bipunctella bore into compass plant (Silphium laciniatum) roots and feed and the larvae of the moth Eucosma giganteana bore into a number of Silphium species roots and feed. Native bees, important pollinators, that may be associated with this ecological site's reference condition include: Colletes brevicornis, Andrena beameri, A. helianthiformis, Protandrena rudbeckiae, Halictus parallelus, Lasioglossum albipennis, L. coreopsis, L. disparilis, L. nymphaereum, Ashmeadiella bucconis, Megachile addenda, Anthidium psoraleae, Eucera hamata, Melissodes coloradensis, M. coreopsis, and M. vernoniae. The Short-winged Katydid (Amblycorypha parvipennis), Green Grasshopper (Hesperotettix speciosus) and Two-voiced Conehead katydid (Neoconcephalus bivocatus) are possible orthopteran associates of this ecological site.

Other invertebrate associates include the Grassland Crayfish (Procambarus gracilis).

*This section prepared by Mike Leahy, Natural Areas Coordinator, Missouri Department of Conservation, 2013. References for this section: Fitzgerald and Pashley 2000b; Heitzman and Heitzman 1996; Jacobs 2001; Johnson 2000; Pitts and McGuire 2000; Schwartz and others 2001.

Other information

Forestry
Management: This ecological site is not recommended for traditional timber management activity. Historically this site was dominated by a ground cover of native prairie grasses and forbs. Some scattered open grown trees may have also been present. Altered sites may be suitable for non-traditional forestry uses such as windbreaks, environmental plantings, alley cropping (a method of planting, in which rows of trees or shrubs are interspersed with rows of crops) or woody biofuels.

Inventory data references

Potential Reference Sites: Loamy Upland Prairie

Plot HIPRCA03 – Maplewood soil
Located in Hite Prairie CA, Morgan County
Latitude: 38.42161
Longitude: -92.864325

Plot DRPRCA02 – Friendly soil
Located in Drovers Prairie CA, Benton County
Latitude: 38.532331

Longitude: -93.293486

Plot HIPRCA02 – Friendly soil
Located in Hite Prairie CA, Morgan County
Latitude: 38.420362
Longitude: -92.864616

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Approval

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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	05/11/2025
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:

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

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

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

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

17. **Perennial plant reproductive capability:**