USDA Natural Resources
Conservation Service

Ecological site R109XY029MO
Wet Upland Drainageway Prairie

Last updated: 7/02/2024
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): 109X–Iowa and Missouri Heavy Till Plain

The Iowa and Missouri Heavy Till Plain is an area of rolling hills interspersed with interfluve divides and alluvial valleys. Elevation ranges from about 660 feet along the lower reaches of rivers, to about 980 feet on stable interfluve summits in southern Iowa. Relief is about 80 to 160 feet between major streams and adjacent interfluve summits. Most of the till plain drains south to the Missouri River via the Grand and Chariton River systems, but the northeastern portion drains southeast to the Mississippi River. Loess caps the pre-Illinoisan aged till on interfluves, whereas the till is exposed on side slopes. Mississippian aged limestone and Pennsylvanian aged sandstone and shale crop out on lower slopes in some areas.

Classification relationships

Terrestrial Natural Community Type in Missouri (Nelson, 2010):
The reference state for this ecological site is most similar to a Wet-Mesic Bottomland Prairie.

National Vegetation Classification System Vegetation Association (NatureServe, 2010):
The reference state for this ecological site is most similar to Andropogon gerardii - Panicum virgatum - Helianthus grosseserratus Herbaceous Vegetation (CEGL002024).

Geographic relationship to the Missouri Ecological Classification System (Nigh & Schroeder, 2002): This ecological site occurs throughout the Central Dissected Till Plains Section.

Ecological site concept

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

Wet Upland Drainageway Prairies are widely distributed in small delineations throughout the upland portions of the MLRA and in adjacent areas. They are associated with Wet Floodplain Prairie sites downstream, and with adjacent upland ecological sites. Soils are very deep, seasonally wet, and subject to flooding. The reference plant community is prairie dominated by a dense cover of wetland species, including prairie cordgrass, sedges, and wetness-tolerant forbs.

Associated sites

R109XY002MO	**Loess Upland Prairie** Loess Upland Prairies are upslope, on summits and shoulders.
R109XY006MO	**Till Upland Prairie** Till Upland Prairies are upslope on prairie landscapes, on gently sloping upper backslopes.
R109XY046MO	**Till Upland Savanna** Till Upland Savannas are upslope, on gently sloping upper backslopes.

Similar sites

R109XY038MO	**Wet Terrace Prairie** Wet Terrace Prairies are similar in composition and structure and are subject to flooding but occur on elevated stream terraces and high floodplains.

Table 1. Dominant plant species

Tree	Not specified
Shrub	(1) *Amorpha fruticosa*
Herbaceous	(1) *Spartina pectinata* (2) *Andropogon gerardii*

Physiographic features

This site is in narrow drainageways in the uplands, with slopes of 1 to 5 percent. The site receives runoff from adjacent upland sites. Most areas are subject to frequent, brief flooding.

The following figure (adapted from Abney, 1997) shows the typical landscape position of this ecological site, and landscape relationships among the major ecological sites of the uplands. The site is within the area labeled as “3”, and is typically downslope from Till Upland Savanna and Loess Upland Prairie sites.

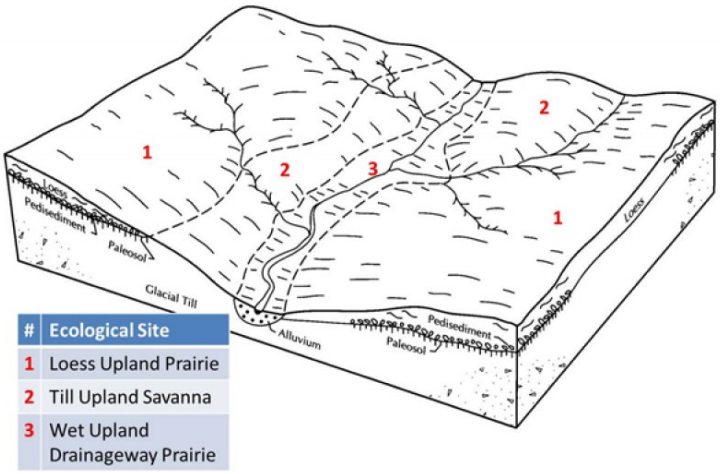


Figure 2. Landscape relationships for this ecological site

Table 2. Representative physiographic features

Landforms	(1) Drainageway
Flooding duration	Very brief (4 to 48 hours) to brief (2 to 7 days)
Flooding frequency	Occasional to frequent
Ponding frequency	None
Slope	1–5%
Water table depth	0–24 in
Aspect	Aspect is not a significant factor

Climatic features

The Iowa and Missouri Heavy Till Plain MLRA 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.

This MLRA experiences small regional differences in climates that grade inconspicuously into each other. The basic gradient for most climatic characteristics is along a line from north to south. Both mean annual temperature and precipitation exhibit fairly minor gradients along this line. Mean January minimum temperature follows the north-to-south gradient. However, mean July maximum temperature shows hardly any geographic variation in the region. Mean July maximum temperatures have a range of only two to three degrees across the region.

Mean annual precipitation varies along the same gradient as temperature – lower annual precipitation in the north, higher in the south. Seasonality in precipitation is very pronounced due to strong continental influences. June precipitation, for example, averages four to five times greater than January precipitation. 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 influences ecological communities by limiting water supplies, especially at times of high temperatures and high evaporation rates. Drought indirectly affects ecological communities by increasing plant and animal susceptibility to the probability and severity of fire. Frequent fires encourage the development of grass/forb dominated communities and understories.

Superimposed upon the basic MLRA climatic patterns are local topographic influences that create topoclimatic, or

microclimatic variations. 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. Slope orientation is an important topographic influence on climate. Summits and south-and-west-facing slopes are regularly warmer and drier, supporting more grass dominated communities than adjacent north- and-east-facing slopes that are cooler and moister that support more woody dominated communities. Finally, the cooler microclimate within a canopied forest is measurably different from the climate of a more open and warmer grassland or savanna area.

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)	139-155 days
Freeze-free period (characteristic range)	167-186 days
Precipitation total (characteristic range)	38-40 in
Frost-free period (actual range)	137-155 days
Freeze-free period (actual range)	166-188 days
Precipitation total (actual range)	36-42 in
Frost-free period (average)	146 days
Freeze-free period (average)	176 days
Precipitation total (average)	39 in

Climate stations used

- (1) CENTERVILLE [USC00131354], Centerville, IA
- (2) KEOSAUQUA [USC00134389], Keosauqua, IA
- (3) BROOKFIELD [USC00230980], Brookfield, MO
- (4) BETHANY [USC00230608], Bethany, MO
- (5) MT AYR [USC00135769], Mount Ayr, IA
- (6) AMITY 4 NE [USC00230143], Maysville, MO

Influencing water features

This ecological site is influenced by a seasonal high water table, resulting from a combination of high groundwater levels and slow hydraulic conductivity, which impedes throughflow from precipitation and flood events. The water table is typically near the surface in late fall through spring, receding in the summer.

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

This ecological site contains first-order streams, which originate from headslope positions at the upper reaches of the units, and are fed from smaller headslopes in the adjacent uplands. The lower reaches of units often contain second-order streams. These streams are ephemeral in most years, with flow in the late fall, winter, and spring months, generally disappearing in the summer, or reduced to isolated pools in the lower reaches. Stream levels typically respond quickly to storm events, especially in watersheds where surface runoff is dominant. Short-duration flooding is common in many areas. Streambeds are typically incised into the surrounding floodplain by as much as 10 feet.

Soil features

These soils were formed under prairie vegetation, and have dark, organic-rich surface horizons. They are affected by a seasonal water table in the spring months. Parent material is alluvium. Soil series associated with this site

include Ackmore, Arbela, Blackoar, Bremer, Colo, Excello, Gifford, Humeston, Nevin, Otter, Speed, Tice, Vesser, Wabash, and Zook.

Table 4. Representative soil features

Parent material	(1) Alluvium
Surface texture	(1) Silt loam (2) Silty clay loam (3) Silty clay
Family particle size	(1) Clayey
Drainage class	Very poorly drained to somewhat poorly drained
Permeability class	Very slow to moderately slow
Surface fragment cover <=3"	0%
Surface fragment cover >3"	0%
Available water capacity (0-40in)	6–9 in
Calcium carbonate equivalent (0-40in)	0%
Electrical conductivity (0-40in)	0–2 mmhos/cm
Sodium adsorption ratio (0-40in)	0
Soil reaction (1:1 water) (0-40in)	4.5–7.3
Subsurface fragment volume <=3" (Depth not specified)	0%
Subsurface fragment volume >3" (Depth not specified)	0%

Ecological dynamics

Information contained in this section was developed using historical data, professional experience, field reviews, and scientific studies. The information presented is representative of very complex vegetation communities. Key indicator plants, animals and ecological processes are described to help inform land management decisions. Plant communities will differ across the MLRA because of the naturally occurring variability in weather, soils, and aspect. The Reference Plant Community is not necessarily the management goal. The species lists are representative and are not botanical descriptions of all species occurring, or potentially occurring, on this site. They are not intended to cover every situation or the full range of conditions, species, and responses for the site.

Wet Upland Drainageway Prairies are found in narrow, low order, upland drainages. This ecological site most often occupied the entire small floodplain below Upland Loess or Till Prairies. This landscape position receives water from upslope and seasonal wetness causes it to be periodically saturated. Accordingly, the presence of trees is limited and is dominated by moisture tolerant grasses, sedges and forbs. Slightly higher areas of the drainageway support occasional widely scattered elm, bur oak, pin oak, and shellbark hickory.

These areas flood occasionally. In addition to flooding and seasonal wetness, fire played a key role in keeping woody species at bay, likely occurring at least once every 3 years. Fire during dry periods removed the dense mat of leaf litter creating opportunities for plants less aggressive than the grasses and sedges.

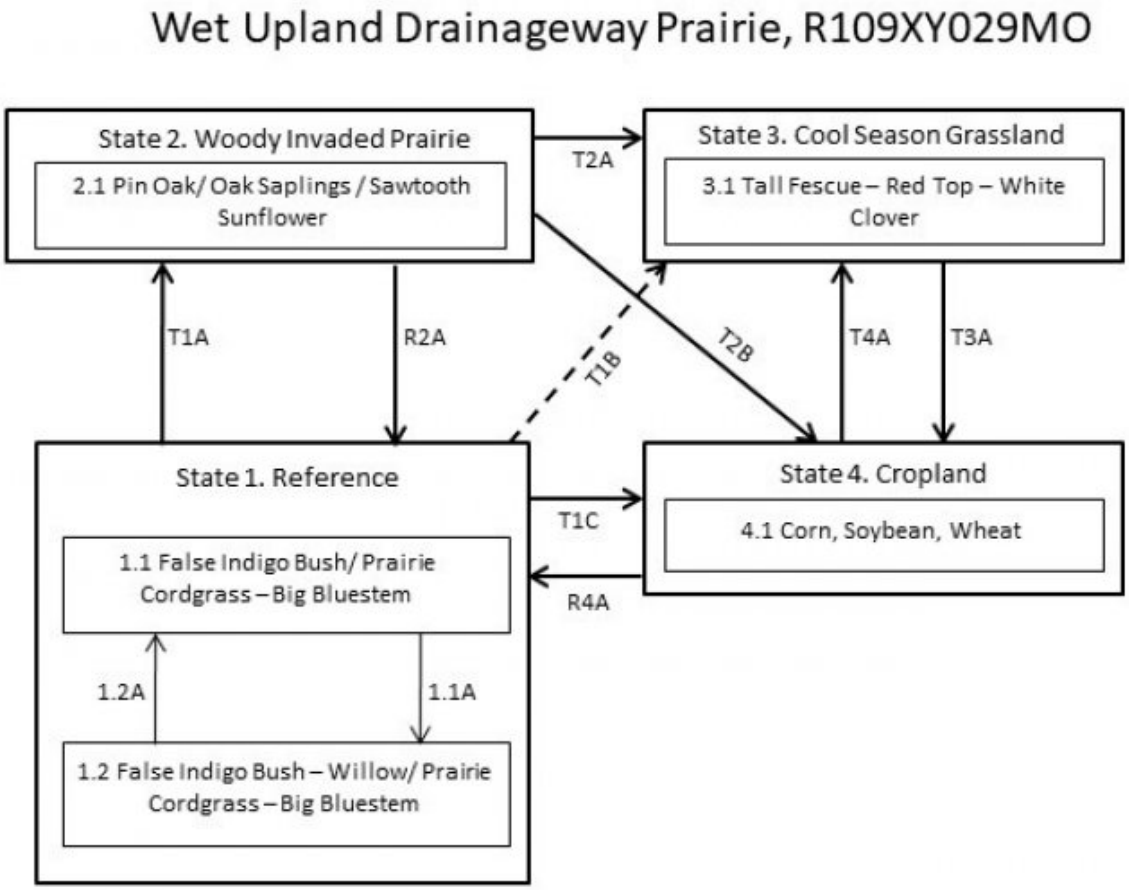
Wet Upland Drainageway Prairies were also subjected to grazing by native large herbivores. Grazing by native herbivores, such as bison, prairie elk, and white-tailed deer, would have effectively kept understory conditions open, creating conditions more favorable to ground flora species and minimizing woody trees and shrubs.

Today most of these ecological sites have been drained and turned into agricultural use. Very few, if any, quality

remnants exist. While their flood regime usually has been altered, because of their site conditions, during wet years, they still act as ephemeral farmed wetlands in the agricultural landscape. Left unfarmed, these wet upland drainageways can be developed into wet prairies and savannas and are prime candidates for restoration of this type of system.

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.

State and transition model



Code	Event/Activity/Process
T1A	Fire suppression > 20 years; woody invasion; reduced flooding duration
T1B	Tillage; vegetative seeding; grassland management; drainage water management
T1C	Tillage; conservation cropping system; drainage water management
T3A	Tillage; conservation cropping system
T2A	Woody removal; tillage; vegetative seeding; grassland management
T2B	Woody removal; tillage; conservation cropping system
T4A	Vegetative seeding ; grassland management
1.1A	Fire-free interval 10+ years; reduced flooding duration
1.2A	Flooding; prescribed fire
R2A	Woody removal; prescribed fire
R3A, R4A	Vegetative seeding; prescribed fire; restore natural hydrology

Figure 9. State and transition diagram for this ecological site

State 1

Reference

This state is typical of wet prairies that are not connected to groundwater (not seepage communities or fens) and that experience full horizon saturation (endosaturation), at least briefly during part of the growing season. Two phases can occur that will transition back and forth depending on fire and flooding frequencies. Longer fire and flooding free intervals will allow woody species to increase such prairie willow, dogwoods and false indigo. When fire and flooding intervals shorten these woody species will decrease or be eliminated. This state is very rare. Nearly all sites have been converted to intensive agriculture cropland along with some cool season grassland.

Dominant plant species

- false indigo bush (*Amorpha fruticosa*), shrub
- willow (*Salix*), shrub
- prairie cordgrass (*Spartina pectinata*), other herbaceous
- big bluestem (*Andropogon gerardii*), other herbaceous

Community 1.1
False Indigo/ Prairie Cord Grass – Big Bluestem

This phase is dominated by big bluestem, switch grass, eastern gama grass and a wide variety of prairie wildflowers while other species such as Culver's root, Michigan lily, and bunchflower added to the mix of floodplain prairie species. These areas flooded periodically. In addition to the flooding, fire played a key role, likely occurring at least once every 3 years.

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

Forest understory. The Forest Understory list is based on reconnaissance-level plots, as well as commonly occurring species listed in Nelson (2010). Species identified from plot data do not include cover estimates. Species not found in plots, but listed in Nelson, do include cover estimates.

Dominant plant species

- false indigo bush (*Amorpha fruticosa*), shrub
- prairie cordgrass (*Spartina pectinata*), other herbaceous
- big bluestem (*Andropogon gerardii*), other herbaceous

Community 1.2
False Indigo - Willow/ Prairie Cord Grass – Big Bluestem

This phase is characterized by long fire free intervals. Woody species would have increased in abundance and spread out onto the prairie. Slightly higher areas within or at the edge of the drainages supported widely scattered bur oak, pin oak, elm, shellbark hickory and willow.

Dominant plant species

- false indigo (*Amorpha*), shrub
- willow (*Salix*), shrub
- prairie cordgrass (*Spartina pectinata*), other herbaceous
- big bluestem (*Andropogon gerardii*), other herbaceous

Pathway 1.1A
Community 1.1 to 1.2

Fire-free interval 10+ years; reduced flooding duration

Pathway 1.2A
Community 1.2 to 1.1

Flooding; prescribed fire

State 2
Woody Invaded Prairie

Degraded reference states that have experienced fire suppression and flooding reduction for 20 or more years will transition to this state. With fire suppression and reduced flooding, woody species such as pin oak and bur oak will begin to increase transitioning this state from a prairie to a Woody Invaded Prairie. Native ground cover will also decrease. Transition from this state to cool season grasslands (State 3) or intensive cropland (State 4) was very common.

Dominant plant species

- pin oak (*Quercus palustris*), tree
- oak (*Quercus*), shrub
- sawtooth sunflower (*Helianthus grosseserratus*), other herbaceous

Community 2.1
Pin Oak/ Oak Saplings / Sawtooth Sunflower

State 3
Cool Season Grassland

Conversion of other states to non-native cool season species such as tall fescue, white clover, and red top has been common in this area. Occasionally, these pastures will have scattered bur oaks or pecan. Transitioning to a Cropland State to help eliminate non-native grassland species and then restoring to a reference state is usually the easiest and most useful method of restoration from this state.

Dominant plant species

- tall fescue (*Schedonorus arundinaceus*), other herbaceous
- redtop (*Agrostis gigantea*), other herbaceous
- white clover (*Trifolium repens*), other herbaceous

Community 3.1
Tall Fescue – Red Top – White Clover

State 4
Cropland

This is the dominant state that exists currently with intensive cropping of corn, soybeans, and wheat occurring. A return to the reference state may be difficult and costly, requiring a very long term series of management options.

Dominant plant species

- corn (*Zea*), other herbaceous
- soybean (*Glycine*), other herbaceous
- wheat (*Triticum*), other herbaceous

Community 4.1
Corn, Soybean, Wheat

Transition T1A
State 1 to 2

Fire suppression >20 years; woody invasion; reduced flooding duration

Transition T1B
State 1 to 3

Tillage; vegetative seeding; grassland management; drainage water management

Transition T1C
State 1 to 4

Tillage; conservation cropping system; drainage water management

Restoration pathway R2A
State 2 to 1

Woody removal; prescribed fire

Transition T2A
State 2 to 3

Woody removal; tillage; vegetative seeding; grassland management

Transition T2B
State 2 to 4

Woody removal; tillage; conservation cropping system

Transition T3A
State 3 to 4

Tillage; conservation cropping system

Restoration pathway R4A
State 4 to 1

Vegetative seeding; prescribed fire; restore natural hydrology

Restoration pathway T4A
State 4 to 3

Vegetative seeding; grassland management

Additional community tables

Table 5. Community 1.1 forest overstory composition

Common Name	Symbol	Scientific Name	Nativity	Height (Ft)	Canopy Cover (%)	Diameter (In)	Basal Area (Square Ft/Acre)
Tree							
pin oak	QUPA2	*Quercus palustris*	Native	–	0–5	–	–
bur oak	QUMA2	*Quercus macrocarpa*	Native	–	0–5	–	–
shellbark hickory	CALA21	*Carya laciniosa*	Native	–	0–5	–	–
slippery elm	ULRU	*Ulmus rubra*	Native	–	0–5	–	–

Table 6. Community 1.1 forest understory composition

Common Name	Symbol	Scientific Name	Nativity	Height (Ft)	Canopy Cover (%)
Grass/grass-like (Graminoids)					
big bluestem	ANGE	*Andropogon gerardii*	Native	–	20–30
prairie cordgrass	SPPE	*Spartina pectinata*	Native	–	20–30
Canada wildrye	ELCA4	*Elymus canadensis*	Native	–	10–20
fescue sedge	CAFE3	*Carex festucacea*	Native	–	10–20
switchgrass	PAVI2	*Panicum virgatum*	Native	–	10–20
hop sedge	CALU4	*Carex lupulina*	Native	–	10–20
fox sedge	CAVU2	*Carex vulpinoidea*	Native	–	10–20
muhly	MUHLE	*Muhlenbergia*	Native	–	–
Indiangrass	SONU2	*Sorghastrum nutans*	Native	–	–
Forb/Herb					
white doll's daisy	BOAS	*Boltonia asteroides*	Native	–	5–20
sweet coneflower	RUSU	*Rudbeckia subtomentosa*	Native	–	5–20
bearded beggarticks	BIAR	*Bidens aristosa*	Native	–	5–20
prairie ironweed	VEFA2	*Vernonia fasciculata*	Native	–	5–20
Virginia bunchflower	VEVI5	*Veratrum virginicum*	Native	–	5–20
Culver's root	VEVI4	*Veronicastrum virginicum*	Native	–	5–20
sawtooth sunflower	HEGR4	*Helianthus grosseserratus*	Native	–	5–20
swamp milkweed	ASIN	*Asclepias incarnata*	Native	–	5–20
winged lythrum	LYAL4	*Lythrum alatum*	Native	–	5–20
wild bergamot	MOFI	*Monarda fistulosa*	Native	–	–
Canada goldenrod	SOAL6	*Solidago altissima*	Native	–	–
white heath aster	SYER	*Symphyotrichum ericoides*	Native	–	–
New England aster	SYNO2	*Symphyotrichum novae-angliae*	Native	–	–
willowleaf aster	SYPR5	*Symphyotrichum praealtum*	Native	–	–
field clover	TRCA5	*Trifolium campestre*	Native	–	–
harvestlice	AGPA6	*Agrimonia parviflora*	Native	–	–
great ragweed	AMTR	*Ambrosia trifida*	Native	–	–
common milkweed	ASSY	*Asclepias syriaca*	Native	–	–
white wild indigo	BAAL	*Baptisia alba*	Native	–	–
Texas goldentop	EUGY	*Euthamia gymnospermoides*	Native	–	–
paleleaf woodland sunflower	HEST	*Helianthus strumosus*	Native	–	–
Shrub/Subshrub					
false indigo bush	AMFR	*Amorpha fruticosa*	Native	–	5–20
prairie willow	SAHU2	*Salix humilis*	Native	–	5–20
white sagebrush	ARLU	*Artemisia ludoviciana*	Native	–	–
silky dogwood	COOB9	*Cornus obliqua*	Native	–	–
blackberry	RUBUS	*Rubus*	Native	–	–
Tree					
black willow	SANI	*Salix nigra*	Native	–	–

Animal community

Wildlife
Game species that utilize this ecological site include: 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.

Migratory Waterbirds: Sora, Common Snipe and Virginia Rail

Furbearers: Muskrat, Beaver, and Mink.

Bird species associated with this ecological site's reference state condition:
Breeding birds: Sedge Wren, Red-Winged Blackbird, American Bittern, Marsh Wren, and Common Yellowthroat.

Migratory birds: Sora, Virginia Rail, Sedge Wren, American Bittern, Yellow Rail and Common Snipe.

Amphibian and reptile species associated with this ecological site's reference state condition: Western Chorus Frog (Pseudacris triseriata triseriata), Plains Leopard Frog (Rana blairi), Graham's Crayfish Snake (Regina grahamii), Midland Brown Snake (Storeria dekayi wrightourm), prairies with crawfish burrows may have Northern Crawfish Frog (Rana areolata circulosa); Western Fox Snake (Elaphe vulpina vulpina), and Western Massasauga rattlesnake (Sistrurus catenatus tergeminus).

Small mammals associated with this ecological site's reference state condition: Muskrat (Ondatra zibethicus), Southern Bog Lemming (Synaptomys cooperi), and Mink (Mustela vison).

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: Swamp Milkweed Leaf Beetle (Labidomera clivicollis), Cordgrass Planthopper (Prokelisia crocea), Dion Skipper butterfly (Euphyes dion), Duke's Skipper butterfly (Euphyes dukesi), native bees (Lasioglossum hartii, Hesperapis carinata, Svastra atripes and Cemolobus ipomoeae), Bullate Meadow katydid (Orchelimum bullatum) and Sedge Grasshopper (Stethophyma celatum).

Other invertebrates: 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 states 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 bio-fuels.

Inventory data references

Potential Reference Sites: Wet Upland Drainageway Prairie

Plot HEPRCA_KS02 – Colo soil
Located in Helton Prairie CA, Harrison County, MO
Latitude: 40.254923
Longitude: - 93.834647

Plot DURANC_KS03 – Bremer soil
Located in Dunn Ranch TNC, Harrison County, MO
Latitude: 40.475916
Longitude: -94.105185

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Contributors

Doug Wallace
Fred Young

Approval

Suzanne Mayne-Kinney, 7/02/2024

Acknowledgments

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This site was originally approved on 07/28/2015 for publication.

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	Suzanne Mayne-Kinney
Approval date	
Composition (Indicators 10 and 12) based on	Annual Production

Indicators

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

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

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:**