Ecological Site Description

Mollic Loess Upland Prairie R109XY002MO

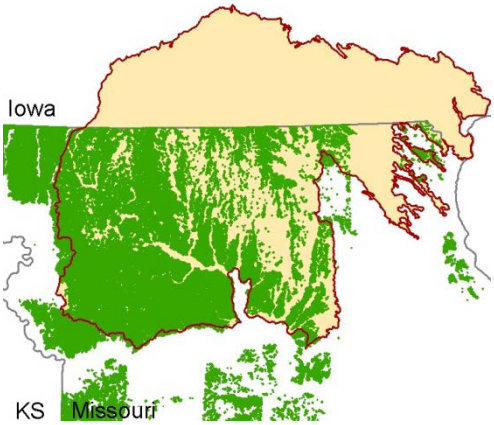
- *(Amorpha canescens-Ceanothus americanus/ Schizachyrium scoparium-Andropogon gerardii)*
- (lead plant – New Jersey tea/ little bluestem – big bluestem)

An Ecological Site Description (ESD) is a reference document of ecological knowledge regarding a particular land area (ecological site). An ESD describes ecological potential and ecosystem dynamics of land areas and their potential management. Ecological sites are linked to soil survey map unit components, which allows for mapping of ecological sites. (***NOTE:*** *This is a "provisional" ESD, and is subject to change. It contains basic ecological information sufficient for conservation planning and land management in Missouri. After additional information is developed and reviewed, a "Certified" ESD will be published and will be available via the Web Soil Survey* http://websoilsurvey.nrcs.usda.gov *.*)

Major Land Resource Area: 109 – Iowa and Missouri Heavy Till Plain

Introduction

The Iowa and Missouri Heavy Till Plain (area outlined in red on the map) 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.



Mollic Loess Upland Prairie are within the green areas on the map (Missouri portion only; Iowa distributions are currently under review). These sites are widespread in the MLRA, particularly in the western and central portions. Soils are very deep, with no rooting restrictions.

Physiographic Features

This site is on upland summit crests, shoulders and upper backslopes, with slopes of 0 to 20%. The site generates runoff to adjacent, downslope ecological sites. This site does not flood.

Soil Features

These soils have no major rooting restriction. The soils were formed under prairie vegetation, and have dark, organic-rich surface horizons. Parent material is loess. Some soils are underlain by pedisediment or shale residuum. The soils have silt loam surface horizons. Subsoils are silty clay loam to silty clay. Some soils are affected by seasonal wetness in spring months. Soil series

associated with this site include Arispe, Belinda, Bevier, Chillicothe, Greenton, Grundy, Herrick, Ladoga, Lagonda, Leonard, Lineville, Macksburg, Pering, Pershing, Seymour, Sharpsburg, Smileyville, and Sturges.

Ecological Dynamics

The reference plant community is characterized as a tallgrass prairie unit dominated by little and big bluestem, Indian grass, sideoats grama, and a wide variety of prairie wildflowers. On lower slopes and draws where water periodically accumulates, more mesic prairie species such as switch grass, eastern gamagrass, cordgrass, Culver's root, Michigan lily, and bunchflower are added to the diverse mix of prairie species In some cases, bur oak, swamp white oak, post oak, elm, American hazelnut, prairie willow and wild plum occurred in small groves or as scattered individuals across the prairie landscape.

These prairies were typically high, dry and fire prone, consequently, this ecological site burned every 1-3 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 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, Mollic Loess Upland Prairies are nearly extirpated from the region as the former prairies have been converted to intensive agriculture. A few known remnants exist but are degraded by fire suppression and grazing by domestic livestock. While planting prairie on former prairie sites is beneficial to wildlife, restoration to the reference state from agricultural land is a long term proposition with uncertain outcomes.

Reference State Plant Community

Shrubs

Common Name	Botanical Name	Cover % (low-high)	Canopy Height (ft)
PASTURE ROSE	*Rosa carolina*	5-10	2
NEW JERSEY TEA	*Ceanothus americanus*	5-10	4
LEAD PLANT	*Amorpha canescens*	5-20	3
PRAIRIE WILLOW	*Salix humilis*	0-10	3
WILD PLUM	*Prunus americana*	0-10	5

Forbs

Common Name	Botanical Name	Cover % (low-high)
WILD QUININE	*Parthenium integrifolium*	5-20
BUTTERFLY WEED	*Asclepias tuberosa*	5-20
BLAZING STAR	*Liatris pycnostachya*	5-20
MISSOURI GOLDENROD	*Solidago missouriensis*	5-20
ASHY SUNFLOWER	*Helianthus mollis*	5-20
RATTLESNAKE MASTER	*Eryngium yuccifolium*	5-20
WHITE INDIGO	*Baptisia alba*	5-20
PRAIRIE MILKWEED	*Asclepias sullivantii*	5-20
FIELD MILKWORT	*Polygala sanguinea*	5-10
ROSINWEED	*Silphium integrefolium*	5-20
PURPLE PRAIRIE CLOVER	*Dalea purpurea*	10-20

PURPLE CONEFLOWER	*Echinacea purpurea*	10-20
COMPASS PLANT	*Silphium laciniatum*	10-20
HOARY PUCCOON	*Lithospermum canescens*	5-20
WILD BERGAMOT	*Monarda fistulosa*	5-20
CULVER'S ROOT	*Veronicastrum virginicum*	5-20
BUNCHFLOWER	*Melanthium virginicum*	10-20

Grasses and sedges

Common Name	**Botanical Name**	**Cover % (low-high)**
LITTLE BLUESTEM	*Schizachyrium scoparium*	30-50
EASTEN GAMA GRASS	*Tripsacum dactyloides*	5-10
PORCUPINE GRASS	*Stipa spartea*	5-10
PRAIRIE DROPSEED	*Sporobolis heretoeipis*	5-10
BIG BLUESTEM	*Andropogon gerardii*	20-30
INDIAN GRASS	*Sorghastrum nutans*	20-30
SWITCHGRASS	*Panicum virgatum*	10-20
SIDE OATS GRAMA	*Bouteloua curtipendula*	10-20

Site Interpretations

Wildlife Species

The most numerous kinds of prairie wildlife are the smallest: insects. As many as 150 kinds of bees and ants live in the prairie. Together with butterflies, moths, beetles and others these insects provide important pollination, cycle nutrients and act as a food source for birds and animals.

In the late spring ground-nesting greater prairie chickens, eastern meadowlarks, dickcissels, bobwhite quail and boblinks are active. Other signature prairie birds are upland sandpipers, grasshopper sparrows, Henslow's sparrows and scissor-tailed flycatchers.

Priaire amphibians and reptiles include the northern crawfish frog, ornate box turtle and bullsnake.

Bison, prairie dogs and elk were once part of this ecological site but no longer occur naturally in this system. Prairie mammals that still exist today include prairie voles and shrews, rabbits, coyote and white tailed deer.

Glossary

Alfic – soil that has clay-dominated subsoil (argillic horizon) with moderate to high amounts of bases such as calcium, and were typically formed under woody vegetation.

Backslope – a hillslope profile position that forms the steepest and generally linear, middle portion of the slope.

Backswamp – marshy or swampy, depressed areas of flood plains between natural levees and valley sides or terraces

Calcareous – the presence of calcium carbonate in the soil parent material within the rooting zone; relatively alkaline

Claypan – a dense, compact, slowly permeable layer in the subsoil having much higher clay content than the overlying material

Chert – hard, extremely dense or compact crystalline sedimentary rock, consisting dominantly of interlocking crystals of quartz

Cliff – a significant vertical, or near vertical, rock exposure

Dolomite – a type of sedimentary rock that is a carbonate mineral composed of calcium magnesium carbonate

Drainageway – the upper most reach of a stream channel system characterized by little meandering

Dry – a site where soil moisture is limiting during the growing season; low available water capacity

Dune – a low mound, ridge, bank or hill of loose, wind-blown sand

Exposed – steep, south and west-facing slopes, which are warmer and drier than other slope aspects

Flatwoods – a type of woodland that occurs on soils with a root restricting subsoil layer within 20 to 30 inches, resulting in very slow runoff and ponding that remains saturated for most of the winter and early spring months but dries out and becomes very dry in the summer months; plants that grow there must be adapted to both conditions

Floodplain – the nearly level plain that borders a stream and is subject to inundation under flood-stage conditions

Footslope – a hillslope position at the base of a slope where hillslope sediment (colluvium) accumulates

Forest – a vegetative community dominated by trees forming a closed canopy and interspersed with shade-tolerant understory species

Fragipan – a dense, brittle subsoil horizon that is extremely hard and compact when dry

Glade – open, rocky, barren vegetative community dominated by drought-adapted forbs and grasses, typically with scattered, stunted woody plants

Igneous –bedrock formed by cooling and solidification of magma. Granite and rhyolite are typical igneous bedrocks in Missouri

Limestone – a type of sedimentary rock composed largely of calcium carbonate

Loess – material transported and deposited by wind and consisting predominantly of silt-size particles

Loamy – soil material containing a relatively equal mixture of sand and silt and a somewhat smaller proportion of clay

Marsh – a type of wetland that is dominated by herbaceous rather than woody plant species

Moist – a site that is moderately well to well drained and has high available water capacity, resulting in a well-balanced supply of moisture (neither too dry nor too wet).

Mollic – soil that has a thick, dark surface horizon and was typically formed under prairie vegetation

Mudstone – blocky or massive, fine-grained sedimentary rock in which the proportions of clay and silt are approximately equal

Natric – a soil horizon that displays a blocky, columnar, or prismatic structure and has a subhorizon with an exchangeable-sodium saturation of over 15%

Outwash – stratified sediments of sand and gravel removed or "washed out" from a glacier by melt-water streams

Pinery – a vegetative community within the historic pine range in Missouri that has shortleaf pine as a significant tree species

Prairie – a vegetative community dominated by perennial grasses and forbs with scattered shrubs and very few trees

Protected – steep, north- and east-facing slopes, which are cooler and moister than other slope aspects

Residuum - unconsolidated, weathered, or partly weathered mineral material that accumulates by disintegration of bedrock in place

Riser – a component of terraces and flood-plain steps consisting of the steep side slope; the escarpment

Riverfront – a vegetative community in the floodplain immediately adjacent and generally parallel to a river or stream channel

River hills – a geographic area characterized by thick, dissected loess deposits, formed immediately adjacent to the edges of the Missouri and Mississippi River floodplains

Sandy – a coarse-sized soil containing a large mixture of sand and gravels and a somewhat smaller proportion of silts and clays with excessive drainage

Sandstone – a sedimentary rock containing dominantly sand-size particles

Savanna – grasslands interspersed with open-grown scattered trees, groupings of trees, and shrubs

Shale – a sedimentary rock formed from clay, silty clay, or silty clay loam deposits and having the tendency to split into thin layers

Shallow – a site with bedrock within 20 inches of the surface

Shoulder – the slope profile position that forms the convex surface near the top of a hill slope; it comprises the transition zone from summit to backslope

Sinkhole – a closed, circular or elliptical depression, commonly funnel-shaped, characterized by subsurface drainage and formed either by dissolution of the surface of underlying bedrock or by collapse of underlying caves within bedrock

Summit – the top or highest area of a hillslope

Swale –shallow, closed depressions irregularly spaced across a floodplain or terrace with an irregularly undulating surface.

Swamp – an area of low, saturated ground, intermittently or permanently covered with water, and predominantly vegetated by shrubs and trees.

Talus – rock fragments of any size or shape (usually coarse and angular) derived from and lying at the base of a cliff or very steep rock slope.

Terrace – a step-like surface, bordering a valley floor that represents the former position of a flood plain

Till – dominantly unsorted and unstratified soil material deposited directly by a glacier

Ultic – soil that has a clay-dominated subsoil (argillic horizon) with low amounts of bases such as calcium, and were typically formed under woody vegetation

Upland – a general term for the higher ground of a region, in contrast with a low-lying, adjacent land such as a valley or floodplain

Wet – a somewhat poorly, poorly or very poorly drained site that has an oversupply of moisture during the growing season

Woodland – a highly variable vegetative community with a canopy of trees ranging from 30 to 100 percent closure with a sparse midstory and a dense ground flora of grasses, sedges and forbs