Ecological Site Description

Mollic Loess River Hills Upland Prairie and Savanna R107BY002MO

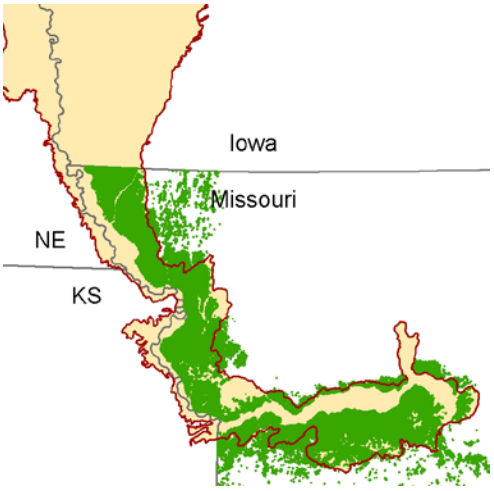
- *(Quercus macrocarpa/Amorpha canescens-Ceanothus americanus/Andropogon gerardii-Schizachyrium scoparium)*
- (bur oak/lead plant – New Jersey tea/big bluestem – little bluestem)

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: 107B – Iowa and Missouri Deep Loess Hills

Introduction

The Iowa and Missouri Deep Loess Hills (area outlined in red on the map) encompass the Missouri River floodplain and associated loess-covered uplands, from about Sioux City Iowa in the north to central Missouri. Elevation is about 1,565 feet on the highest ridges, to about 600 feet along the Missouri River near Glasgow in central Missouri. Local relief varies from 10-20 feet in the major river floodplains, to 50-100 feet in the dissected uplands, with loess bluffs of 200 to 300 feet along the Missouri River. The loess thins with distance from the Missouri river, and local relief decreases. The loess caps pre-Illinoian till, which crops out on lower hillslopes near the edges of the MLRA. The underlying bedrock is mainly Pennsylvanian and Cretaceous-aged shale, mudstone and sandstone.



Mollic Loess River Hills Upland Prairie and Savannas are within the green areas on the map (Missouri portion only; Iowa distributions are currently under review). These sites are widespread in the uplands of the MLRA. Soils are very deep, and loamy throughout.

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. 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, Chillicothe, Edina, Grundy, Higginsville, Kilwinning, Ladoga, Macksburg, Pering, Pershing, Seymour, Sharpsburg, and Sturges.

Ecological Dynamics

The reference plant community is characterized as a dry-mesic prairie with scattered small islands of shrubs and trees, and is dominated by tall, warm-season grasses such as Indiangrass, big bluestem, and switchgrass. The major mid-grass is little bluestem. Combined, these grasses will account for 65 to 75 percent of vegetation produced annually. Other mid-grasses include sideoats grama, prairie dropseed, Canada wildrye, and Scribners panicum. Loess River Hills Upland Prairie and Savanna occur on interfluves and side slopes on uplands and on risers and treads on loess covered stream terraces. This ecological site evolved through periods of large native herbivore grazing and rest. Fire historically occurred across the site every two to four years with accumulation of fuel loads occurring during rest periods.

These sites are well drained and also supported a wide variety of native forbs interspersed throughout the grass stand. The most abundant forbs are purple prairie clover, various coneflowers, goldenrod species, and stiff sunflower. Lesser amounts of hoary puccoon, wild bergamot, blazing star, compass plant, false bonset were also present. Leadplant and New Jersey tea are low growing shrubs that occur throughout the site. Unlike most shrubs, these plants are quite tolerant to fire. Occasional, scattered, large bur oaks may also be present.

These sites are very productive. Today, most of these communities are in row crop cultivation. Some steeply sloping areas are forested or pastured. The principal crops are corn, soybeans, small grains, and hay. The small remaining Loess River Hills Upland Prairie and Savanna sites are a stable plant community when controlled grazing and prescribed fire are used as management activities. A prescribed grazing program that incorporates periods of deferment during the growing season benefits the tall grasses and even the more palatable forb species. Exclusion of fire can lead to woody encroachment. Excessive grazing and livestock trailing can quickly impact soil stability and lead to sheet and gully erosion. Conversion back to a reference community from a cropland or non-native grass state can be expensive and may take many years before fully converted.

Reference State Plant Community

Canopy Trees

Common Name	Botanical Name	Cover % (low-high)	Canopy Height (ft)
BUR OAK	*Quercus macrocarpa*	0-10	50
DWARF CHINKAPIN OAK	*Quercus prinoides*	0-10	15

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

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
FALSE BONESET	*Brickellia eupatorioides*	5-20
RIGID GOLDENROD	*Solidago rigida*	10-20

Grasses and sedges

Common Name	Botanical Name	Cover % (low-high)
LITTLE BLUESTEM	*Schizachyrium scoparium*	10-30
MEAD'S SEDGE	*Carex meadii*	5-10
PORCUPINE GRASS	*Stipa spartea*	5-10
PRAIRIE DROPSEED	*Sporobolis heretoeipis*	5-10
BIG BLUESTEM	*Andropogon gerardii*	30-50
INDIAN GRASS	*Sorghastrum nutans*	20-30
SWITCHGRASS	*Panicum virgatum*	10-20
CANADA WILD RYE	*Elymus canadensis*	5-10
SCRIBNERS PANICUM	*Dichanthelium oligosanthes var. scribnerianum*	5-10

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 a 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