Ecological Site Description

Wet Upland Drainageway Prairie R116BY037MO

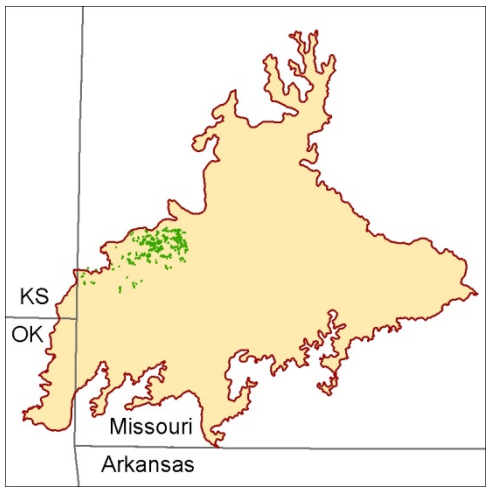
- *(/Salix humilis/Spartina pectinata - Andropogon gerardii)*
- (/prairie willow/prairie cord grass – big bluestem)

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 "Correlated" ESD will be published and will be available via the Web Soil Survey* http://websoilsurvey.nrcs.usda.gov .)

Major Land Resource Area: 116B – Springfield Plain

Introduction

The Springfield Plain (area outlined in red on the map) 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.



Wet Upland Drainageway Prairies (green areas on the map) occur in narrow upland drainageways. Soils are clayey and wet, and are subject to flooding.

Physiographic Features

This site is on upland drainageways with slopes of 0 to 3 percent. The site receives some runoff from upland sites and is subject to flooding.

Soil Features

These soils have no rooting restriction. They were formed under a mixture of prairie and woodland vegetation. Parent material is alluvium. They have silty clay loam surface horizons and clayey subsoils. They are affected by a seasonal high water table during the spring months. Soil series associated with this site include Humansville.

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 Prairie ecological sites exist because of their association with wet, poorly drained conditions and fire. They are found in narrow, low order, upland drainages that were subject to flooding. These conditions along with periodic fire had a strong influence on excluding trees. Wet Upland Drainageway Prairies are dominated by a dense cover of wet tolerant grasses and forbs. On slightly higher areas within or at the edge of the prairie matrix scattered bur oak, pin oak, shellbark hickory and willow occurred amid the grass-dominated landscape.

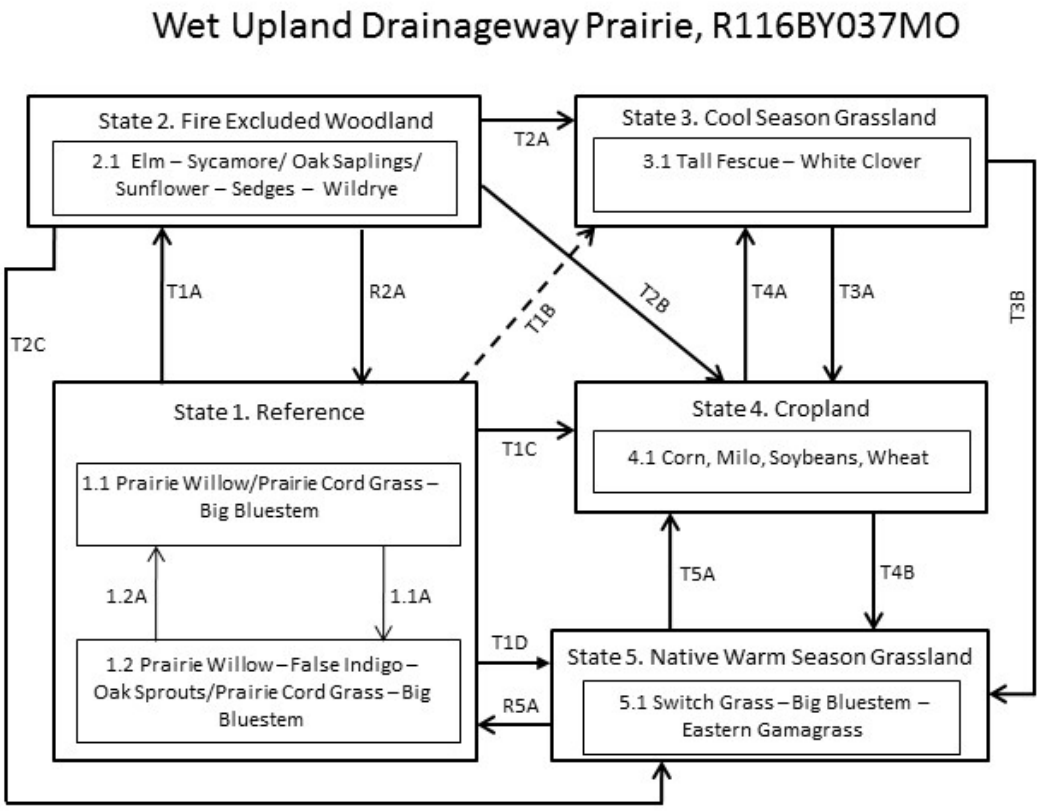
These sites are on upland drainageway positions that experience short but frequent flooding. In addition to site wetness, periodic fire, likely occurring at least once every 3 years, also played a role in keeping woody species from exploiting the site. Fire during dry periods removed the dense mat of leaf litter creating opportunities for forbs less aggressive than the grasses and sedges and killed or damaged woody species that were developing on the site.

Wet Upland Drainageway Prairies were also subjected to grazing by native large herbivores. Grazing by large native herbivores, such as bison, elk, and 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 farmed. Only a few quality remnants exist. However, during wet years, they do act as ephemeral farmed wetlands in the agricultural landscape. While their flood regime usually has been altered, their position and soil properties still make them good candidates for wet prairie and savanna development management.

A State and Transition Diagram is depicted in Figure 1. 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.

Figure 1: State and Transition Diagram



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
T2C	Woody removal; grassland management; prescribed fire
T4A	Vegetative seeding ; grassland management
T3B, T4B	Vegetative seeding; prescribed fire; grassland management
1.1A	Fire-free interval 5-10 years
1.2A	Fire interval 1-3 years
R2A	Woody removal; prescribed fire 1-3 years
R5A	Vegetative seeding; prescribed fire 1-3 years

Ecological States

State 1: Reference

This State is native prairie dominated by prairie cord grass, big bluestem and forbs, along with numerous shrubs and occasional, widely scattered trees such as pin oak and bur oak. 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 pin oak and bur oak. When fire intervals shorten these woody species will decrease.

This undisturbed State is uncommon but some excellent examples still exist. Most sites, however, have been converted to cool season grasslands, cropland, or degraded by domestic grazing.

State 2: Fire Excluded Woodland
Reference States that have experienced fire suppression for 20 or more years will transition to this State. With fire suppression, woody species such as elm, sycamore, pin oak and bur oak will begin to increase transitioning this state from a prairie to a degraded woody invaded state. Native ground cover will also decrease. Transition to cool season grasslands (State 3) or cropland (State 4) is very common. Transition back to a reference state may be difficult if fire suppression and other disturbances have been long term. It may be easier to move to a re-established native warm season grassland and then over time move back to a reference state.

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 in this area. Occasionally, these pastures will have a few scattered bur oaks. Long term uncontrolled grazing can cause significant soil erosion and compaction. A return to the Reference State may require a very long series of management options.

State 4: Cropland
This is a common state that currently exists in the region with corn, soybeans, milo, wheat, and hay land production 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.

State 5: Native Warm Season Grassland
Conversion from 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, once established, can be transformed back to a Reference State. Substantial restoration time and management inputs will still be needed.

Reference State Plant Community
Canopy Trees

Common Name	Botanical Name	Cover % (low-high)	Canopy Height (ft)
PIN OAK	*Quercus palustris*	0-5	70
BUR OAK	*Quercus macrocarpa*	0-5	70
SHELLBARK HICKORY	*Carya laciniosa*	0-5	60

Shrubs

Common Name	Botanical Name	Cover % (low-high)	Canopy Height (ft)
PRAIRIE WILLOW	*Salix humiis*	5-20	5
FALSE INDIGO	*Amorpha fruticosa*	5-20	4

Forbs

Common Name	Botanical Name	Cover % (low-high)
SWAMP MILKWEED	*Ascelpias incarnata*	1-10
SMALL WHITE ASTER	*Aster fragilis*	1-10
SAWTOOTH SUNFLOWER	*Helianthus grosseserratus*	1-10
WINGED LOOSESTRIFE	*Lythrum alatum*	1-10
FALSE ASTER	*Boltonia asteroids*	1-10
SWEET CONEFLOWER	*Rudebeckia subtomentosa*	1-10
TICKSEED SUNFLOWER	*Bidens aristosa*	1-10
IRONWEED	*Vernonia fasciculata*	1-10
BUNCH FLOWER	*Melanthium virginicum*	1-10
CULVER'S ROOT	*Veronicastrum virginicum*	1-10

Grasses and sedges

Common Name	Botanical Name	Cover % (low-high)
OKLAHOMA SEDGE	*Carex oklahomensis*	10-20
RAVEN-FOOT SEDGE	*Carex crus-corvi*	10-20
SAWBEAK SEDGE	*Carex stipata*	10-20
SWITCH GRASS	*Panicum virgatum*	10-20
PRAIRIE CORD GRASS	*Spartina pectinata*	10-20
CANADA WILDRYE	*Elymus canadensis*	10-20
BIG BLUESTEM	*Andropogon gerardii*	10-20
BLUEJOINT GRASS	*Calamagrostis canadensis*	10-20
EASTERN GAMAGRASS	*Tripsacum dactyloides*	10-20

Site Interpretations

Influencing Water Features

- Cowardin wetland types include: Palustrine Emergent Temporarily Flooded and Seasonally Flooded

*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

  Furbearers: Muskrat, Beaver, and Mink.

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

  Migratory birds: Sora, Sedge Wren, Least 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*), Southern Leopard Frog (*Rana sphenocephala*), Midland Brown Snake (*Storeria dekayi wrightourm*), and prairies with crawfish burrows may have Northern Crawfish Frog (*Rana areolata circulosa*).

- 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

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. 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.

Glossary

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).

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

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

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

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