

Ecological Site Description

Wet Terrace Prairie

R113XY004MO

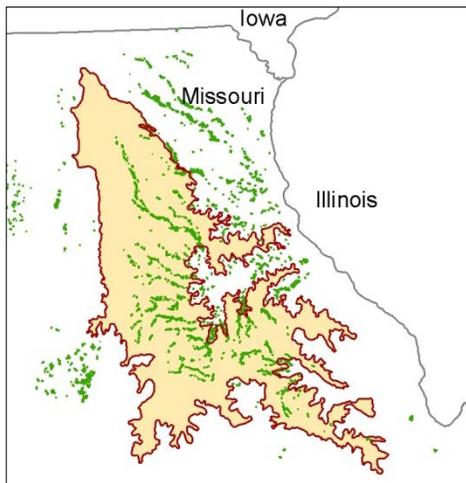
- (/Salix humilis/Spartina pectinata - Andropogon gerardii)
- (/prairie willow/prairie cordgrass – big bluestem)

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: 113 – Central Claypan, Western Part

Introduction

The western, Missouri portion of the Central Claypan (area outlined in red on the map) is a weakly dissected till plain. Elevation ranges from about 1,000 feet in the north along the divide between



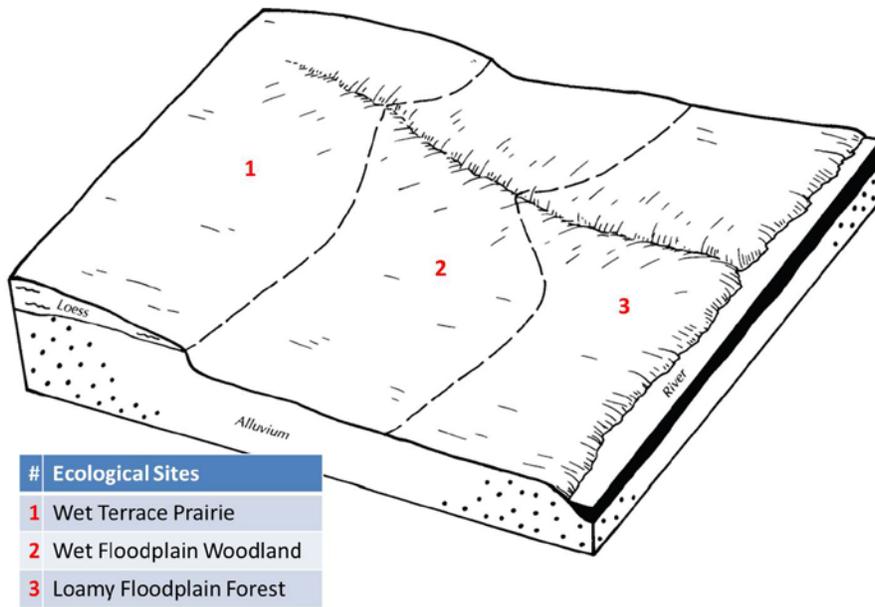
the Missouri and Mississippi River watersheds to about 625 feet where the North Fork of the Salt River flows out of the area. Relief is generally low, with low slope gradients and relatively narrow drainageways. Most of the Central Claypan is in the Salt River watershed. The characteristic “claypan” occurs in the loess that caps the pre-Illinoian aged till on the broad interfluvial areas that characterize this region. Till is exposed on lower slopes. The underlying Mississippian aged limestone and Pennsylvanian aged shale is exposed in only a few places along lower slopes above the Salt River.

Wet Terrace Prairies (green area on the map) are scattered throughout the MLRA and adjacent areas in river valleys of the major streams of the area, such as the Salt River and its tributaries. They are associated with floodplain ecological sites such as Loamy Floodplain Forest and Wet Floodplain Woodland, which are on lower positions closer to the stream channel. Adjacent upland sites are typically Till Savanna or Loess Prairie. Soils have silty clay subsoil that perches water in the spring, and affects rooting depth and species composition.

Physiographic Features

This site is on footslopes and stream terraces with slopes of 0 to 9 percent. The site receives runoff from adjacent upland sites. A few areas are subject to rare flooding.

The following figure (adapted from Young and Geller, 1995) shows the typical landscape position of this ecological site, and landscape relationships with the dominant floodplain ecological sites in this MLRA.



Soil Features

These soils have an abrupt textural change to silty clay at about 12 inches, or clayey subsoil that is similar to an abrupt textural change. Abrupt textural changes impede but do not exclude rooting. The soils were formed under prairie vegetation, and have dark, organic-rich surface horizons. Parent material is loess over alluvium or colluvium from loess and till. They have silt loam surface horizons and clayey

subsoils. A seasonal high water table is perched above the clayey subsoil during the spring months. Soil series associated with this site include Chariton, Edinburg and Gifford.

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 Terrace Prairie ecological sites exist because of their association with wet conditions and heavy, clayey soils. These conditions along with periodic fire have a strong influence on excluding trees. Wet Terrace Prairies are dominated by a dense cover of wet tolerant grasses and forbs. On slightly higher areas within the ecological site occasional widely scattered bur oak, pin oak, and shellbark hickory also occurred.

These sites were on relatively stable former floodplain positions that rarely flooded, probably once every 25 or so years. In addition to site wetness, periodic fire also played a role in keeping woody species at bay. Fire during dry periods removed the dense mat of leaf litter creating opportunities for plants less aggressive than the grasses and sedges.

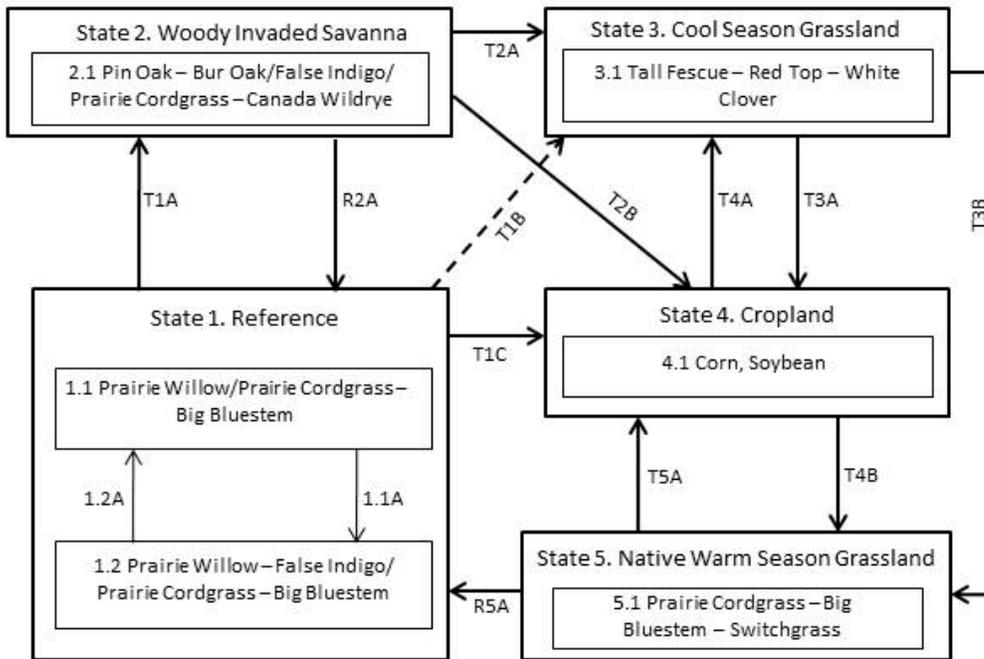
Wet Footslope Prairies were also subjected to grazing by native large herbivores, such as bison, elk, and deer. Grazing by native herbivores would have effectively kept understory conditions open, creating conditions more favorable to ground flora species and minimizing woody trees and shrubs.

Today almost all of these ecological sites have been drained and farmed. 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. Quality remnants are very rare.

A State and Transition Diagram is depicted below. 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.

Wet Terrace Prairie, R113XY004MO



Code	Event/Activity/Process
T1A	Fire suppression > 20 years; woody invasion
T1B	Tillage; vegetative seeding; grassland management
T1C, T3A, T5A	Tillage; conservation cropping system
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

Ecological States

State 1: Reference

This State is native tall grass prairie dominated by prairie cordgrass, big bluestem and a wide variety of prairie forbs. This state occurs on level to gently sloping soils. In some cases, bur oak, swamp white oak, elm, American hazelnut, prairie willow and wild plum occurred in small groves or as scattered individuals across the prairie landscape.

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 prairie willow, dogwoods and wild plum. When fire intervals shorten these woody species will decrease.

This State is very rare. Most sites have been converted to cool season grassland and intensive agriculture cropland.

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 will begin to increase 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. Today, this State is probably nonexistent. Transition from this state to cool season grasslands (State 3) or intensive cropland (State 4) was very common in the late 1800's to early 1900's.

State 3: Cool Season Grassland

Conversion of other states to non-native cool season species such as tall fescue, red top and white clover has been common in this area. Occasionally, these pastures will have scattered bur oaks. Long term uncontrolled grazing and a lack of grassland management can cause significant soil erosion and compaction and increases in less productive species such as Kentucky bluegrass and weedy forbs such as ironweed. A return to the Reference State may be impossible, requiring a very long term series of management options.

State 4: Cropland

This is the dominant State that exists currently with intensive cropping of corn and soybeans occurring. Some conversion to cool season hay land occurs for a limited period of time before transitioning back to cropland. Limited acres are sometimes converted to native warm season grassland through federal set-aside programs.

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 still be needed.

Reference State Plant Community

Canopy Trees

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

Shrubs

Common Name	Botanical Name	Cover % (low-high)	Canopy Height (ft)
PRAIRIE WILLOW	<i>Salix humilis</i>	5-20	5
FALSE INDIGO	<i>Amorpha fruticosa</i>	5-20	6

Forbs

Common Name	Botanical Name	Cover % (low-high)
SWAMP MILKWEED	<i>Asclepias incarnata</i>	5-20
SMALL WHITE ASTER	<i>Symphyotrichum racemosum</i>	5-20
SAWTOOTH SUNFLOWER	<i>Helianthus grosseserratus</i>	5-20
WINGED LOOSESTRIFE	<i>Lythrum alatum</i>	5-20
FALSE ASTER	<i>Boltonia asteroides</i>	5-20
SWEET CONEFLOWER	<i>Rudbeckia subtomentosa</i>	5-20
BEARDED BEGGARTICKS	<i>Bidens aristosa</i>	5-20
PRAIRIE IRONWEED	<i>Vernonia fasciculata</i>	5-20
VIRGINIA BUNCHFLOWER	<i>Veratrum virginicum</i>	5-20
CULVER'S ROOT	<i>Veronicastrum virginicum</i>	5-20
WATER KNOTWEED	<i>Polygonum amphibium</i>	5-20
SWAMP AGRIMONY	<i>Agrimonia parviflora</i>	5-20
WATER PARSLEY	<i>Sium suave</i>	5-20
VIRGINIA BLUE FLAG	<i>Iris virginica</i>	5-20

Grasses and sedges

Common Name	Botanical Name	Cover % (low-high)
HOP SEDGE	<i>Carex lupulina</i>	5-20
FOX SEDGE	<i>Carex vulpinoidea</i>	5-20
FESCUE SEDGE	<i>Carex festucacea</i>	5-20
SWITCH GRASS	<i>Panicum virgatum</i>	10-30
PRAIRIE CORD GRASS	<i>Spartina pectinata</i>	10-40
CANADA WILDRYE	<i>Elymus canadensis</i>	5-20
BIG BLUESTEM	<i>Andropogon gerardii</i>	10-40
BLUEJOINT GRASS	<i>Calamagrostis canadensis</i>	5-20

Site Interpretations*Influencing Water Features*

- Cowardin wetland types include: Palustrine Emergent Temporarily Flooded and Intermittently Flooded (high-water table may cause soil saturation in late winter and early spring).

*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 poult 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.

Migratory Waterbirds include: Sora, Common Snipe and Virginia Rail

- Bird species associated with this ecological site's reference state condition include: 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, Upland Sandpiper, Greater Prairie Chicken, Northern Bobwhite

Mid-Vegetation Height (0.5 – 1 meter, moderate litter levels, some bare ground visible):

Eastern Meadowlark, Dickcissel, Field Sparrow, Upland Sandpiper, Greater Prairie Chicken, Northern Bobwhite, Eastern Kingbird, Bobolink, Lark Sparrow

Tall Vegetation Height (> 1 meter, moderate-high litter levels, little bare ground visible):

Henslow's Sparrow, Dickcissel, Greater Prairie Chicken, Field Sparrow, Northern Bobwhite, Sedge Wren, Northern Harrier, *Red-Winged Blackbird*, *American Bittern*

Brushy – Mix of grasses, forbs, native shrubs (e.g., *Rhus copallina*, *Prunus americana*, *Rubus* spp., *Rosa carolina*) and small trees (e.g., *Cornus racemosa*): Bell's Vireo, Yellow-breasted Chat, Loggerhead Shrike, Brown Thrasher, Common Yellowthroat

Winter Resident: Short-Eared Owl, Le Conte's Sparrow

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 include: prairies with or nearby to fishless ponds/pools (may be ephemeral) may have Eastern Tiger Salamander (*Ambystoma tigrinum tigrinum*) and Western Chorus Frog (*Pseudacris triseriata triseriata*); Northern Crawfish Frog (*Rana areolata circulosa*), Ornate Box Turtle (*Terrapene ornata ornata*), Western Slender Glass Lizard (*Ophisaurus attenuatus attenuatus*), Eastern Yellow-bellied Racer (*Coluber constrictor flaviventris*), Prairie Ring-necked Snake (*Diadophis punctatus arnyi*), and Bullsnake (*Pituophis catenifer sayi*).

- Small mammals associated with this ecological site's reference state condition include: Least Shrew (*Cryptotis parva*), Franklin's Ground Squirrel (*Spermophilus franklinii*), Plains Pocket Gopher (*Geomys bursarius*), Prairie Vole (*Microtus ochrogaster*), Southern Bog Lemming (*Synaptomys cooperi*), Meadow Jumping Mouse (*Zapus hudsonius*), Thirteen-lined Ground Squirrel (*Spermophilus tridecemlineatus*) and Badger (*Taxidea taxus*).
- Invertebrates include:
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 include: Regal Fritillary butterfly (*Speyeria idalia*) whose larvae feed primarily on native prairie violets (*Viola pedata*, *V. pedatifida*, and *V. sagittata*); 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. nymphaeum*, *Ashmeadiella buconis*, *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

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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