

Ecological Site Description

Loamy Footslope Woodland

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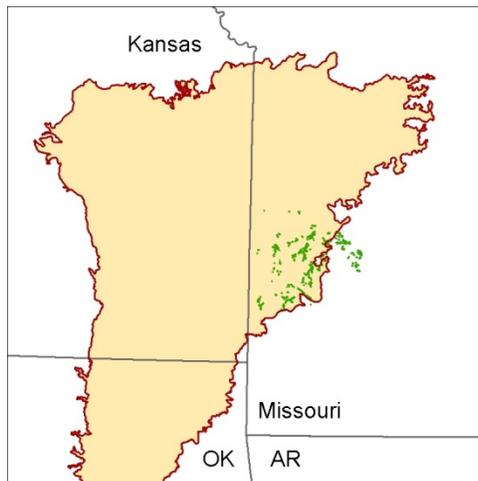
- (*Quercus velutina* - *Quercus alba*/*Cercis canadensis* - *Rhus aromatica*/*Elymus virginicus* - *Schizachyrium scoparium*)
- (black oak – white oak/red bud – aromatic sumac/Virginia wildrye – little bluestem)

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

Major Land Resource Area: 112 – Cherokee Prairies

Introduction

The Cherokee Prairies MLRA (area outlined in red on the map) is a nearly level to rolling, weakly dissected plain. Elevation ranges from about 330 feet along the Verdigris River in the south to over 1,300 feet along the northwest border with the Flint Hills. Local relief is three to ten feet, with major valley floodplains typically less than eight feet below the adjacent uplands. The northern and eastern part of the area is primarily in the Osage River watershed, and the southern part is mainly in the Neosho and Verdigris River watersheds. Loess blankets the northern part of the area but thins to the south. Nearly all of the upland plain is underlain with Pennsylvanian aged sandstones and shales, and most upland soils are formed in residuum from these materials.



Loamy Footslope Woodlands are within the green areas on the map (Missouri portion only; relationships to Kansas and Oklahoma Ecological Sites are currently under review). These sites are not extensive. They are in scattered footslope locations in Vernon, Barton and Cedar counties, Missouri, in the southern part of the area. Soils are very deep and loamy.

Physiographic Features

This site is on footslopes with slopes of 2 to 5 percent. The site receives runoff from adjacent upland sites. This site does not flood.

Soil Features

These soils have no rooting restriction. The soils were formed under woodland vegetation, and have thin, light-colored surface horizons. Parent material is colluvium from loess and mixed sandstone

and shale residuum. Surface horizons are loam or silt loam. Subsurface horizons are loamy. These soils are not affected by seasonal wetness. Soil series associated with this site include Arnica.

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.

Loamy Footslope Woodlands occur on a variety of colluvial materials at a transitional position between drier uplands and wetter lowlands. The historic reference condition is woodland dominated by an overstory of black oak and white oak, with scattered post oak and bur oak. The canopy is moderately tall (60 to 70 feet) but rather open (55 to 75 percent closure) with a dense understory of native grasses and forbs. Increased light from an open canopy causes a diversity of woodland ground flora species to flourish. Woodlands are distinguished from forest, by their relatively open understory, and the presence of sun-loving ground flora species. Characteristic plants in the ground flora can be used to gauge the restoration potential of a stand along with remnant open-grown old-age trees, and tree height growth.

Because of their proximity to prairies, fire played a significant role in the maintenance of these systems, more so than the sites to the south. It is likely that these ecological sites burned at least once every 3 to 5 years. These periodic fires kept woodlands open, removed the litter, and stimulated the growth and flowering of the grasses and forbs. During fire free intervals, woody understory species increased and the herbaceous understory diminished. The return of fire would open the woodlands up again and stimulate the abundant ground flora.

Loamy Footslope Woodlands were also subjected to occasional disturbances from wind and ice, as well as grazing by native large herbivores, such as bison, elk, and deer. Wind and ice would have periodically opened the canopy up by knocking over trees or breaking substantial branches off canopy trees. Grazing by native herbivores would have effectively kept understory conditions more open, creating conditions more favorable to oak reproduction and woodland ground flora species.

Today, these ecological sites have been cleared and converted to pasture or cropland or have undergone repeated timber harvest and domestic grazing. Most existing forested ecological sites have a younger (50 to 80 years) canopy layer whose species composition and quality has been altered by timber harvesting practices. In the long term absence of fire, woody species, especially hickory and sugar maple, encroach into these woodlands. Once established, these woody plants can quickly fill the existing understory increasing shade levels with a greatly diminished ground flora. Removal of the younger understory and the application of prescribed fire have proven to be effective restoration means.

These ecological sites are moderately productive. Oak regeneration is typically problematic. Maintenance of the oak component will require disturbances that will encourage more sun adapted

species and reduce shading effects. Single tree selection timber harvests are common in this region and often results in removal of the most productive trees (high grading) in the stand leading to poorer quality timber and a shift in species composition away from more valuable oak species. Better planned single tree selection or the creation of group openings can help regenerate and maintain more desirable oak species and increase vigor on the residual trees.

Clearcutting also occurs and results in dense, even-aged stands dominated by oak. This may be most beneficial for existing stands whose composition has been highly altered by past management practices. However, without some thinning of the dense stands and application of fire, the ground flora diversity can be shaded out and diversity of the stand may suffer.

Reference State Plant Community

Canopy Trees

Common Name	Botanical Name	Cover % (low-high)	Canopy Height (ft)
WHITE OAK	<i>Quercus alba</i>	20-30	60
BLACK OAK	<i>Quercus velutina</i>	30-50	70
CHINKAPIN OAK	<i>Quercus muehlenbergii</i>	10-20	60
POST OAK	<i>Quercus stellata</i>	10-20	60
SHAGBARK HICKORY	<i>Carya ovata</i>	10-20	60
SHUMARD OAK	<i>Quercus shumardii</i>	5-10	70

Shrubs

Common Name	Botanical Name	Cover % (low-high)	Canopy Height(ft)
AROMATIC SUMAC	<i>Rhus aromatica</i>	10-20	5
AMERICAN HAZELNUT	<i>Corylus americana</i>	10-20	5
DWARF HACKBERRY	<i>Celtis tenuifolia</i>	10-20	6
RED BUD	<i>Cercis canadensis</i>	10-30	12

Forbs

Common Name	Botanical Name	Cover % (low-high)
YELLOW PINPERNEL	<i>Taenidia integerrima</i>	5-20
ORANGE PUCCOON	<i>Lithospermum canescens</i>	5-20
BENT MILK VETCH	<i>Astragalus distortus</i>	5-20
BUTTERFLYWEED	<i>Asclepias tuberosa</i>	5-20
ELM-LEAVED GOLDENROD	<i>Solidago ulmifolia</i>	5-20
POINTED LEAF TICK-TREFOIL	<i>Desmodium glutinosum</i>	5-20
EASTERN BEEBALM	<i>Monarda bradburiana.</i>	5-20
PURPLE CONEFLOWER	<i>Echinacea purpurea</i>	5-20
HAIRY SUNFLOWER	<i>Helianthus hirsutus</i>	5-20
BLAZING STAR	<i>Liatris aspera</i>	5-20

Grasses and sedges

Common Name	Botanical Name	Cover % (low-high)
SLENDER WOODLAND SEDGE	<i>Carex digitalis</i>	10-20
OVAL-LEAF SEDGE	<i>Carex cephalophora</i>	10-20
LITTLE BLUESTEM	<i>Schizachyrium scoparium</i>	10-30
WOODLAND BROME	<i>Bromus pubescens</i>	10-20
BOTTLEBRUSH GRASS	<i>Elymus hystrix</i>	10-20
VIRGINIA WILDRYE	<i>Elymus virginicus</i>	10-30

Site Interpretations

Wildlife

- This forest type contains high structural and compositional diversity important for a number of songbirds and amphibians.
- Bird species associated with early-successional Woodlands are Prairie Warbler, Field Sparrow, Brown Thrasher, Blue-winged Warbler, White-eyed Vireo, Blue-gray Gnatcatcher, Yellow-breasted Chat, Indigo Bunting, and Eastern Towhee.
- Birds associated with mid-successional Woodlands include Whip-poor-will and Wood Thrush.
- Birds associated with late-successional Woodlands include Worm-eating warbler, Whip-poor-will, Great Crested Flycatcher, Ovenbird, Pileated Woodpecker, Wood Thrush, Red-eyed Vireo, Northern Parula, Louisiana Waterthrush (near streams), and Broad-winged Hawk.
- Reptile and amphibian species associated with mature Woodlands include: ringed salamander, spotted salamander, marbled salamander, central newt, long-tailed salamander, dark-sided salamander, southern red-backed salamander, three-toed box turtle, western worm snake, western earth snake, and American toad.

Forestry

- **Management:** Estimated site index values range from 55 to 60 for oak. Timber management opportunities are good. Create group openings of at least 2 acres. Large clearcuts should be minimized if possible to reduce impacts on wildlife and aesthetics. Uneven-aged management using single tree selection or small group selection cuttings of ½ to 1 acre are other options that can be used if clear cutting is not desired or warranted. Using prescribed fire as a management tool could have a negative impact on timber quality, and should be used with caution on a particular site if timber management is the primary objective. Favor white oak, post oak, chinkapin oak, and black oak.
- **Limitations:** No major equipment restrictions or limitations exist. Erosion is a hazard when slopes exceed 15 percent. On steep slopes greater than 35 percent, traction problems increase and equipment use is not recommended.

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

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

References

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