

## *Ecological Site Description*

### **Sandy Exposed Backslope Woodland**

**F134XY012MO**

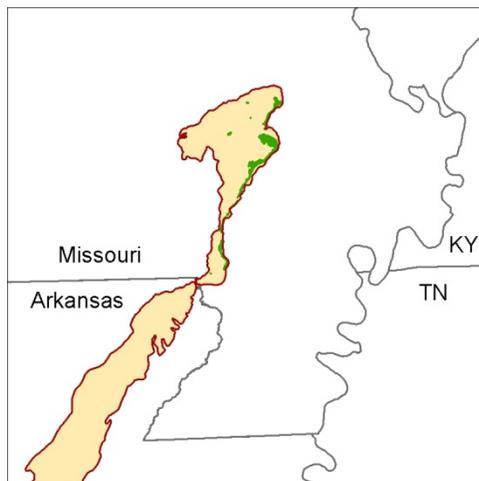
- (*Quercus velutina* - *Quercus falcata*/*Vaccinium angustifolium* /*Carex* - *Desmodium nudiflorum*)
- (black oak – southern red oak/lowbush blueberry/sedge – naked tick trefoil)

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:** 134 – Southern Mississippi Valley Loess

### **Introduction**

The Southern Mississippi Valley Loess (area outlined in red on the map; northern portion only) is a relatively narrow strip of the coastal plain bordering the Mississippi River valley that is blanketed with loess. The northern part of this MLRA, discussed here, is locally referred to as Crowley’s Ridge. Elevation ranges from about 300 feet on the footslopes to nearly 600 feet on the highest ridges. Loess caps the summits and upper slopes, and Pliocene-aged sand and gravel deposits of the coastal plain influence soils on lower, steeper slopes.



Sandy Exposed Backslope Woodlands are within the green area on the map (Missouri portion only; distributions farther south are currently under review). They occupy the southerly and westerly aspects of steep, dissected slopes, and are mapped in complex with the Sandy Protected Backslope Forest ecological site. These sites are on the easternmost uplands of Crowley’s Ridge in Stoddard and Dunklin counties, Missouri. They are directly downslope from Loess Backslope ecological sites, and are mapped in complex with them. Soils are very deep and sandy.

### **Physiographic Features**

This site is on upland backslopes, with slopes of 15 to 35 percent. It is on exposed aspects (south, southwest, and west), which receive significantly more solar radiation than the protected aspects. The site receives runoff from upslope summit and shoulder sites, and generates runoff to adjacent, downslope ecological sites. This site does not flood.

## Soil Features

These soils have acidic subsoils that are low in bases. The soils were formed under woodland vegetation, and have thin, light-colored surface horizons. Parent material is coastal plain sediments. They are sandy throughout and excessively drained. These soils are not affected by seasonal wetness. Soil series associated with this site include Eustis.

## 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.*

Sandy Exposed Backslope Woodlands occur on the southerly and westerly aspects of steep, dissected slopes along Crowley's Ridge. The sloping position and coarse textured, excessively drained sands impacts on the growth of trees and supports a diverse ground cover grass and forb community. The canopy is moderate in height (60 to 70 feet) and open (30 to 50 percent closure). Increased light from the open canopy causes a diversity of 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.

In addition to droughtiness, fire played a role in keeping woody species at bay, likely occurring at least once every 3 to 5 years. Fire restricts the dominance of trees and removes the dense mat of leaf litter creating opportunities for plants less aggressive than the grasses and sedges. During fire free intervals woody species would have increased, only to be checked with the return of fire.

Sandy Exposed Backslope 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. Grazing by native herbivores would have effectively kept understory conditions more open, creating conditions more favorable to oak reproduction and sun-loving ground flora species. Wind and ice would have periodically opened the canopy up by knocking over trees or breaking substantial branches off canopy trees.

Today, these ecological sites have been cleared and converted to pasture 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, 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 not productive. Clear-cutting timber or removing the understory increases the risk of wind erosion. Harvest methods that leave some mature trees to provide shade and soil protection may be desirable. Their position and soil properties make them good candidates for sand woodland development and management.

## Reference State Plant Community

### Canopy Trees

Common Name	Botanical Name	Cover % (low-high)	Canopy Height (ft)
WHITE OAK	<i>Quercus alba</i>	10-20	50
BLACK OAK	<i>Quercus velutina</i>	20-30	70
POST OAK	<i>Quercus stellata</i>	10-20	60
SOUTHERN RED OAK	<i>Quercus falcata</i>	20-30	70
BLACK HICKORY	<i>Carya texana</i>	10-20	50

### Shrubs

Common Name	Botanical Name	Cover % (low-high)	Canopy Height (ft)
LOWBUSH BLUEBERRY	<i>Vaccinium angustifolium</i>	10-20	4
AMERICAN HAZELNUT	<i>Corylus americana</i>	10-20	6
HIGHBUSH BLUEBERRY	<i>Vaccinium arboretum</i>	10-20	10

### Forbs

Common Name	Botanical Name	Cover % (low-high)
PRAIRIE BUSH CLOVER	<i>Lespedeza violacea</i>	5-20
VARIGATED MILKWEED	<i>Asclepias variegata</i>	5-20
ROUGH BUTTONWEED	<i>Diodia teres</i>	5-20
NAKED TICK TREFOIL	<i>Desmodium nudiflorum</i>	5-20
HAIRY BUSH CLOVER	<i>Lespedeza hirta</i>	5-20
SWEET GOLDENROD	<i>Solidago odora</i>	5-20
GOLDEN ASTER	<i>Heterotheca villosa</i>	5-20
EASTERN BEEBALM	<i>Monarda bradburiana</i>	5-20
BLUE TOADFLAX	<i>Nuttallanthus canadensis</i>	5-20
SLENDER KNOTWEED	<i>Polygonum tenue</i>	5-20
ELM LEAF GODLENROD	<i>Solidago ulmifolia</i>	5-20
BLUE CURLS	<i>Trichostema dichotomum</i>	5-20

### Grasses and sedges

Common Name	Botanical Name	Cover % (low-high)
WOOLLY THREE-AWN	<i>Aristida lanosa</i>	5-20
WHITE TINGED SEDGE	<i>Carex albicans</i>	5-20
OVAL HEAD SEDGE	<i>Carex cephalophora</i>	5-20
ILLINOIS FLATSEEDGE	<i>Cyperus grayoides</i>	5-20
BALDWINS FLATSEEDGE	<i>Cyress croceus</i>	5-20
HOP SEDGE	<i>Carex lupulina</i>	5-20

## Site Interpretations

### Wildlife

- Oaks provide abundant hard mast; scattered shrubs provide soft mast; native legumes provide high-quality wildlife food;

- Sedges and native cool-season grasses provide green browse; native warm-season grasses provide cover and nesting habitat; and a diversity of forbs provides a diversity and abundance of insects.
- Post-burn areas can provide temporary bare-ground – herbaceous cover habitat important for turkey poults and quail chicks.
- Bird species associated with early-successional woodlands are Northern Bobwhite, Prairie Warbler, Field Sparrow, Blue-winged Warbler, Yellow-breasted Chat, and Brown Thrasher. Bird species associated with mid- to late successional woodlands to maturing are Indigo Bunting, Red-headed Woodpecker, Eastern Bluebird, Northern Bobwhite, Summer Tanager, Eastern Wood-Pewee, Whip-poor-will, Chuck-will's widow, Red-eyed Vireo, Rose-breasted Grosbeak, Yellow-billed Cuckoo, and Broad-winged Hawk.
- Reptile and amphibian species associated with Mixed Oak Woodlands include ornate box turtle, northern fence lizard, five-lined skink, broad-headed skink, six-lined racerunner, flat-headed snake, rough earth snake, and timber rattlesnake.

### Forestry

- **Management:** Estimated site index values for oaks range from 50 to 55. Timber management opportunities are fair. Sandy textures and lower available water affects tree growth and increases windthrow hazards. Harvest methods that leave some mature trees to provide shade and soil protection may be desirable. Restrict cuttings to group selection cuttings of 2 to 5 acres or single tree selections. These sites respond well to prescribed fire as a management tool. Where possible, favor black oak, southern red oak, white oak and post oak.
- **Limitations:** Sand; low available water capacity and low fertility. The loose sandy upper layer hinders the use of wheeled equipment especially when the soil is saturated or very dry. Severe seedling mortality may occur because of lack of adequate soil moisture. Soil blowing may damage seedlings and young trees. Hand planting or direct seeding may be necessary. Seedling mortality due to low available water capacity may be high. Mulching or providing shade can improve seedling survival. 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

*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

## **References**

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