# *Ecological Site Description*

## Shallow Limestone/Dolomite Exposed Backslope Glade/Woodland R115BY047MO

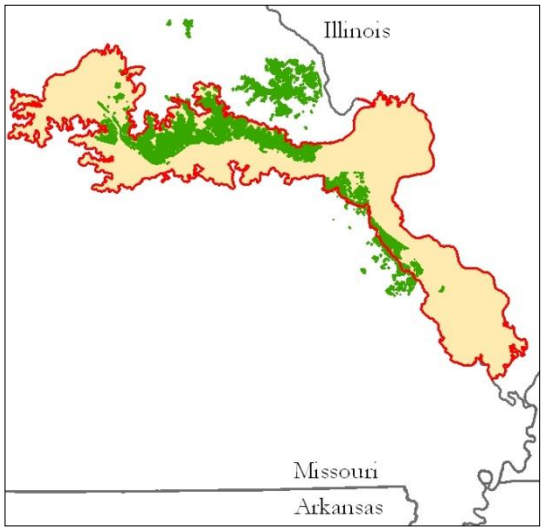
- *(Quercus muehlenbergii/Bumelia lanuginosa - Rhus copallina/Schizachyrium scoparium - Bouteloua curtipendula)*
- (chinkapin oak/gum bumelia – winged sumac/little bluestem – sideoats grama)

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](http://websoilsurvey.nrcs.usda.gov) .)

**Major Land Resource Area:** 115B – Central Mississippi Valley Wooded Slopes, Western Part

**Introduction**

The Central Mississippi Valley Wooded Slopes, Western Part (area outlined in red on the map) consists mainly of the deeply dissected, loess-covered hills bordering the Missouri and Mississippi Rivers as well as the floodplains and terraces of these rivers. It wraps around the northeast corner of the Ozark Uplift, and constitutes the southern border of the Pre-Illinoisan-aged till plain. Elevation ranges from about 320 feet along the Mississippi River near Cape Girardeau in the south to about 1,020 feet on the highest ridges near Hillsboro, MO in the east. Local relief varies from 10-20 feet in the major river floodplains, to 50-100 feet in the dissected uplands, with bluffs of 200 to 350 feet along the Mississippi and Missouri Rivers. Underlying bedrock is mainly Ordovician-aged dolomite and sandstone, with Mississippian-aged limestone north of the Missouri River.




Shallow Limestone/Dolomite Exposed Backslope Glade/Woodlands are within the green areas on the map. They occupy the southerly and westerly aspects of steep, dissected slopes, and are mapped in complex with the Limestone/Dolomite Protected Backslope Glade/Woodland ecological site. They commonly occur on Ordovician-aged dolomite, and are typically associated with Chert Limestone/Dolomite and Calcareous Limestone/Dolomite ecological sites. Soils are very shallow to limestone or dolomite bedrock.

**Physiographic Features**
This site is on upland backslopes with slopes of 15 to 100%. It is on exposed aspects (south, southwest, and west), which receive significantly more solar radiation than the protected aspects. The site generates runoff to adjacent, downslope ecological sites, and in places receives runoff from upslope summit and shoulder sites. This site does not flood.

**Soil Features**
These soils are underlain with limestone and/or dolomite bedrock at less than 20 inches. The soils were formed under prairie vegetation, and have dark, organic-rich surface horizons. Parent material is limestone and dolomite residuum. These soils are loamy or clayey, and are skeletal, with high amounts of limestone/dolomite gravel, channers and flagstones. They are not affected by seasonal wetness. Soil series associated with this site include Gasconade and Ranacker.

**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 vegetational communities. Not all scenarios or plants are included. Key indicator plants, animals and ecological processes are described to help inform land management decisions.*

The shallow soils of this Glade/Woodland complex limit the growth and abundance of trees and support the native grasses and forbs that dominate these systems. Fire also played an important role in the maintenance of these systems. It is likely that these systems burned at least once every five years. These periodic fires removed the litter and stimulated the growth and flowering of the grasses and forbs. They also further limited the growth and dominance of trees, especially eastern redcedar.

Fire tolerant chinquapin oak and post oak occupied islands and the edges of deeper range of the soil component, creating a complex mosaic of open glade and low-density woodland. During fire-free intervals, woody species increased, but not to the current densities on over-grazed glades.

The Shallow Limestone/Dolomite Exposed Backslope Glade/Woodlands from wide open grassy areas with shallow soils and bare bedrock, to areas with widely scattered chinquapin and post oaks. These ecological sites harbor a wide diversity of plants and animals.

Many species, like little bluestem, Indian grass, and sideoats grama, are also found on upland prairies. But others, such as Missouri coneflower, calamint, and federally listed Missouri bladder-pod, are only found on limestone/dolomite glades. Desert-adapted animals, like scorpions and tarantulas, also occupy healthy glades.

In the absence of fire, woody species, especially eastern redcedar, quickly occupy the site. This is especially true after grazing has reduced grass cover and exposed more soil surface to the dispersal of cedar seeds by birds. Once established, cedars can quickly fill in a glade/woodland system, especially if grazing has diminished the vigor of the diverse flora.

Many glades today have been heavily grazed and suffer substantial cedar invasion. Removal of the cedar by chainsaw and the application of prescribed fire are effective management tools.

**Reference State Plant Community**

Canopy Trees

| Common Name | Botanical Name | Cover % (low-high) | Canopy Height (ft) |
|---|---|---|---|
| CHINKAPIN OAK | *Quercus muehlenbergii* | 5-20 | 30 |
| BLUE ASH | *Fraxinus quadrangulata* | 5-20 | 30 |
| POST OAK | *Quercus stellata* | 5-20 | 30 |

Lichens

| Common Name | Botanical Name | Cover % (low-high) |
|---|---|---|
| FISHSCALE LICHEN | *Psora decipiens* | 5-20 |
| SARCOGYNE LICHEN | *Sarcogyne regularis* | 5-20 |
| RUSSELL'S LICHEN | *Psora russellii* | 5-20 |
| JELLY STRAP | *Thyrea confusa* | 5-20 |

Shrubs

| Common Name | Botanical Name | Cover % (low-high) | Canopy Height (ft) |
|---|---|---|---|
| CAROLINA BUCKTHORN | *Rhamnus caroliniana* | 5-10 | 10 |
| FRAGRANT SUMAC | *Rhus aromatica* | 5-10 | 3 |
| DWARF HACKBERRY | *Celtis tenuifolia* | 5-10 | 5 |
| GUM BUMELIA | *Bumelia lanuginosa* | 5-20 | 8 |
| WINGED SUMAC | *Rhus copallina* | 5-20 | 4 |

Forbs

| Common Name | Botanical Name | Cover % (low-high) |
|---|---|---|
| HOARY PUCCOON | *Lithospermum canescens* | 10-20 |
| BRISTLY SUNFLOWER | *Helianthus hirsutus* | 10-20 |
| MISSOURI CONEFLOWER | *Rudebeckia missouriensis* | 10-20 |
| SILKY ASTER | *Aster sericeus* | 10-20 |
| CAROLINA LARKSPUR | *Delphinium carolinianum* | 10-20 |
| BUTTERFLY WEED | *Asclepias tuberosa* | 10-20 |
| SCURFY PEA | *Psoralidium tenuiflorum* | 10-20 |
| BLAZING STAR | *Liatris aspera* | 10-20 |
| YELLOW STAR GRASS | *Hypoxis hirsuta* | 10-20 |
| NARROW-LEAVED BLUETS | *Hedyotis nigricans* | 10-20 |
| PRAIRIE DOCK | *Silphium t terebinthinaceum* | 10-20 |
| LICHEN | *Psora decipiens* | 10-20 |
| LICHEN | *Sarcogyne regularis* | 10-20 |

Grasses and sedges

| Common Name | Botanical Name | Cover % (low-high) |
|---|---|---|
| LITTLE BLUESTEM | *Schizachyrium scoparium* | 10-30 |
| WOODLAND BROME | *Bromus pubescens* | 10-20 |
| SIDEOATS GRAMA | *Bouteloua curtipendula* | 10-30 |
| SLENDER WOOD SEDGE | *Carex digitalis* | 10-20 |
| INDIANGRASS | *Sorghastrum nutans* | 5-20 |
| PUFFSHEATH DROPSEED | *Sporobolus neglectus* | 5-10 |
| MEAD'S SEDGE | *Carex meadii* | 5-10 |

## Site Interpretations

### *Wildlife Species*

- Wildlife habitat: oaks provide hard mast; numerous native legumes provide high-quality wildlife food; native warm-season grasses provide extensive 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.

- Game species that utilize this ecological site include:

  Northern Bobwhite will utilize this ecological site for food (seeds, insects), cover needs (escape, nesting and roosting cover) and brood-rearing habitat.

  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 poults 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.

- Bird species associated with this ecological site's reference state condition:

  Breeding Birds: Field Sparrow, Yellow-breasted Chat, White-eyed Vireo, Brown Thrasher, Indigo Bunting, Red-headed Woodpecker, Eastern Bluebird, Northern Bobwhite, Prairie Warbler, and Eastern Towhee.

- Amphibian and reptile species that may be associated with this ecological site's reference state: Collared Lizard (*Crotaphytus collaris collaris*), Five-lined Skink (*Eumeces fasciatus*), Six-lined Racerunner (*Cnemidophorus sexlineatus*), Flat-headed Snake (*Tantilla gracilis*), Eastern Coachwhip (*Masticophis flagellum flagellum*), Red Milk Snake (*Lampropeltis triangulum syspila*), Eastern Narrow-mouthed Toad (*Gastrophyne carolinensis*), Coal Skink (*Eumeces anthracinus pluvialis*), Ground Snake (*Snora semiannulata*), and Prairie Ring-necked Snake (*Diadophis punctatus arnyi*).

- Small mammals likely associated with this ecological site's reference state condition: Eastern Woodrat (*Neotoma floridana*) and *Peromyscus* species.

- Invertebrates – Many native insect species are likely associated with this ecological site's reference state condition, especially native bees, ants, beetles, butterflies and moths, and crickets, grasshoppers and katydids.

  Insect species likely associated with this ecological site's reference state condition: Dusted Skipper butterfly (*Atrytonopsis hianna*), Cobweb Skipper butterfly (*Hesperia metea*), Pepper and Salt Skipper butterfly (*Amblyscirtes hegon*), Delaware Skipper butterfly (*Atryone logan*

*logan*), Crossline Skipper butterfly (*Polites origenes*), native ants (*Crematogaster lineolata, Monomorium minimum, Forelius pruinosus Paratrechnia terricola),* and native bees *(Colletes aestivalis, Andrena helianthiformis, Protandrena rudbeckiae, Lasioglossum coreopsis, Anthidium psoraleae* and *Dianthidium subrufulum*).

Other invertebrates: Black Widow spider (*Latrodectus mactans*) and Striped Bark Scorpion (*Centruroides vittatus*)

**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

**References**

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