

## *Ecological Site Description*

### **Loamy Footslope Forest**

**F134XY013MO**

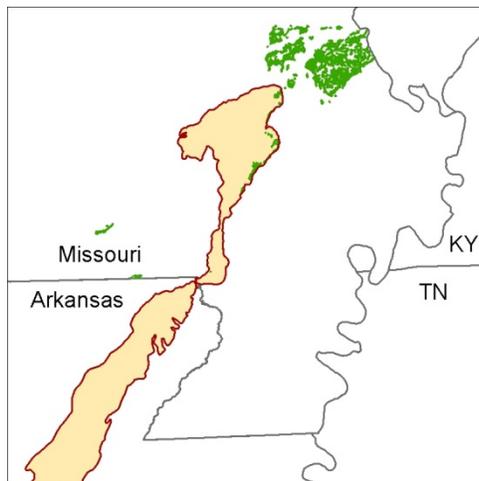
- (*Acer saccharum* - *Quercus rubra*/*Asimina triloba*/*Asarum canadense*)
- (sugar maple – northern red oak/pawpaw/wild ginger)

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.



Loamy Footslope Forests are within the green area on the map (Missouri portion only; distributions farther south are currently under review). These sites are locally extensive on footslopes of Crowley’s Ridge mostly in Scott County, Missouri, and in adjacent lowland areas in southern Cape

Girardeau County, Missouri. Soils are very deep, typically with loamy surfaces and loamy or clayey subsoils.

### **Physiographic Features**

This site is on footslopes and stream terraces with slopes of 0 to 8 percent. The site receives runoff from adjacent upland sites. Some areas flood on rare occasions.

### **Soil Features**

These soils have no rooting restriction. The soils were formed under forest vegetation, and have thin, light-colored surface horizons. Parent material is alluvium in some areas, loess in some areas, and marine sediments in some areas. Surface horizons are loam or silt loam. Subsurface horizons are loamy or clayey. Some soils are slightly affected by seasonal wetness. Soil series associated with this site include Adler, Farrenburg, Lilbourn, Memphis, and Shadygrove.

## 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 Forests are on relatively stable former floodplain or alluvial positions. The reference plant community is dominated by a wide variety of deciduous hardwood tree species including sugar maple, northern red oak, bitternut hickory, white oak, American elm, walnut and Kentucky coffee tree. Trees are generally large and tall forming a dense, closed canopy.

Both historically and today, these forests are structurally and compositionally diverse, with occasional tree-fall gaps and natural mortality providing opportunities for regeneration of overstory species. The understory is also complex, with multiple layers of shade tolerant species such as pawpaw, spicebush, Ohio buckeye and leatherwood. Grape vines, greenbriar, and Virginia creeper are also present along with a diverse array of ground flora species that carpets the forest floor.

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.

Loamy Footslope Forests are productive timber sites. Timber harvest in this region typically is done using single-tree selection, and often results in removal of the most productive trees, or high-grading of the stand. This can result in poorer quality timber and a shift in species composition away from more valuable oak species.

Carefully planned single tree selection or the creation of group openings can help regenerate more desirable oak species and increase vigor on the residual trees. Clear-cutting does occur and results in dense, even-aged stands of primarily 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, the ground flora diversity can be shaded out and productivity of the stand may suffer.

Prescribed fire can play a beneficial but limited role in the management of this ecological site. The higher productivity of these sites makes it more challenging than on other forest and woodland sites in the region. Control of woody species will be more difficult.

Loamy Footslope forests did evolve with some fire, but their composition often reflects more closed, forested conditions, with fewer woodland ground flora species that can respond to fire.

Consequently, while having these sites in a burn unit is acceptable, targeting them solely for woodland restoration is not advisable.

## Reference State Plant Community

### Canopy Trees

Common Name	Botanical Name	Cover % (low-high)	Canopy Height (ft)
WHITE OAK	<i>Quercus alba</i>	5-20	80
WHITE ASH	<i>Fraxinus americana</i>	5-20	80
KENTUCKY COFFEE TREE	<i>Gymnocladus dioica</i>	5-20	70
HACKBERRY	<i>Celtis occidentalis</i>	5-20	70
BITTERNUT HICKORY	<i>Carya cordiformis</i>	5-20	90
AMERICAN BEECH	<i>Fagus grandifolia</i>	5-20	70
BLACK WALNUT	<i>Juglans nigra</i>	5-20	80
NORTHERN RED OAK	<i>Quercus rubra</i>	20-40	90
SUGAR MAPLE	<i>Acer saccharum</i>	20-40	80

### Understory Trees

Common Name	Botanical Name	Cover % (low-high)	Canopy Height (ft)
OHIO BUCKEYE	<i>Aesculus glabra</i>	10-20	50
PAWPAW	<i>Asimina triloba</i>	10-20	20

### Shrubs

Common Name	Botanical Name	Cover % (low-high)	Canopy Height (ft)
WAHOO	<i>Euonymus atropurpureus</i>	10-20	8
SPICEBUSH	<i>Lindera benzoin</i>	10-20	6
LEATHERWOOD	<i>Dirca palustris</i>	10-20	6

### Vines

Common Name	Botanical Name	Cover % (low-high)
VIRGINIA CREEPER	<i>Parthenocissus quinquefolia</i>	10-20
SUMMER GRAPE	<i>Vitis aestivalis</i>	10-20
POISON IVY	<i>Toxicodendron radicans</i>	10-20

### Forbs

Common Name	Botanical Name	Cover % (low-high)
PALE TOUCH-ME-NOT	<i>Impatiens pallida</i>	5-20
WILD GINGER	<i>Asarum canadense</i>	10-20
CLEARWEED	<i>Pilea pumila</i>	5-20
WHITE WOODLAND ASTER	<i>Aster lateriflorus</i>	5-20
WOOD NETTLE	<i>Laportea canadensis</i>	10-20
WATERLEAF	<i>Hydrophyllum virginianum</i>	5-20
BLUE BELLS	<i>Mertensia virginica</i>	5-20
WHITE TROUT LILY	<i>Erythronium albidum</i>	5-20

### Grasses and sedges

Common Name	Botanical Name	Cover % (low-high)
EASTERN STAR SEDGE	<i>Carex radiata</i>	5-10
WOOD REED GRASS	<i>Cinna arundinacea</i>	5-10

## 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 Foothill Forests 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 Foothill Forests include Whip-poor-will and Wood Thrush.
- Birds associated with late-successional Foothill Forests 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 Foothill Forests 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: Field collected site index values average 75 for white oak and 88 for northern red oak/black 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, may not be fitting, or should be used with caution on a particular site if timber management is the primary objective. Favor black walnut, white oak and northern red 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

*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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