Ecological Site Description

Talus Footslope Forest F107BY005MO

- *(Quercus rubra - Acer saccharum/Hydrangea arborescens/Hepatica nobilis var. acuta - Impatiens capensis*)
- (northern red oak – sugar maple/wild hydrangea/sharp-lobed hepatica – spotted touch-me-not)

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 (MLRA): 107B – Iowa and Missouri Deep Loess Hills

Introduction

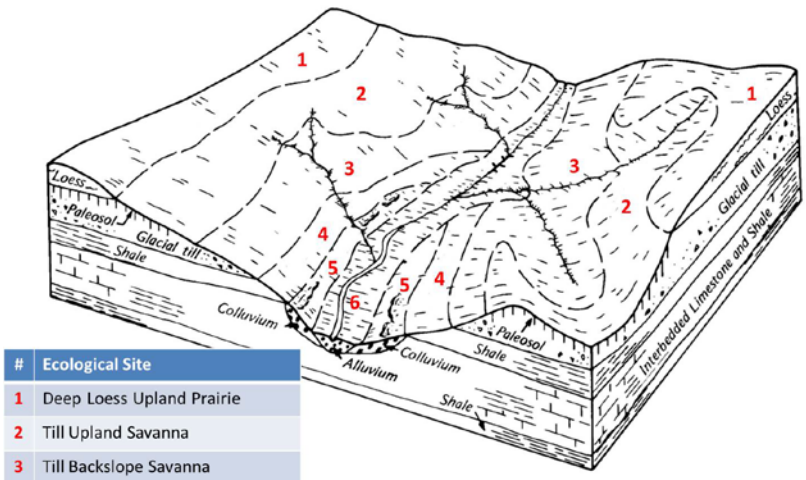
The Iowa and Missouri Deep Loess Hills (area outlined in red on the map) encompass the Missouri River floodplain and associated loess-covered uplands, from about Sioux City Iowa in the north to central Missouri. Elevation is about 1,565 feet on the highest ridges, to about 600 feet along the Missouri River near Glasgow in central Missouri. Local relief varies from 10 to 20 feet in the major river floodplains, to 50 to 100 feet in the dissected uplands, with loess bluffs of 200 to 300 feet along the Missouri River. The loess thins with distance from the Missouri river, and local relief decreases. The loess caps pre-Illinoian till, which crops out on lower hillslopes near the edges of the MLRA. The underlying bedrock is mainly Pennsylvanian and Cretaceous-aged shale, mudstone and sandstone.

Talus Footslope Forests are within the green areas on the map (Missouri portion only; Iowa distributions are currently under review). These sites occur in the central part of the MLRA, in Andrew County, Missouri. Soils are very deep, with an abundance of limestone/dolomite coarse fragments.

Physiographic Features

This site is on upland backslopes with slopes of 14 to 50 percent. The site generates runoff to adjacent, downslope ecological sites, and receives runoff from upslope summit and shoulder sites. This site does not flood.

The following figure (adapted from Davis, 1990) shows the typical landscape position of this ecological site, and landscape relationships with other ecological sites. The site is within the area



#	Ecological Site
1	Deep Loess Upland Prairie
2	Till Upland Savanna
3	Till Backslope Savanna
4	Shale Backslope Savanna
5	Talus Footslope Forest
6	Wet Upland Drainageway Prairie

labeled "5", on steep footslope positions. Shale Backslope sites are directly upslope, and are included within the area labeled "4". Colluvium from this upslope shale is the major parent material for the Talus Footslope Forest soils

Soil Features

These soils have no rooting restriction. Although the soils were formed under woodland vegetation, they have dark, organic-rich surface horizons. Parent material is slope alluvium from limestone and dolomite residuum. These soils have silty clay loam surface horizons with high amounts of dolomite and limestone channers and flags, and have skeletal, clayey subsoils. They are not affected by seasonal wetness. Soil series associated with this site include Brussels.

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.

This community develops at the base of slopes on rock fragments derived from the weathering and erosion of cliff and steeply sloping uplands. Large masses of accumulated angular rock fragments, stones and boulders make up the primary substrate. The resulting soils are moderately well to well-drained.

In this region, talus forests are flanked by historic fire-prone prairies, savannas and open woodlands, but occur in protected landscape positions on lower, steep slopes in the deeper valleys. Although fire infrequently spread (estimated every 10 to 25 years) into this reference community the resulting canopy is still somewhat open (50 to 70 percent canopy cover), tall (80 to 90 feet), and dominated by mesic woody species such as sugar maple, northern red oak, and basswood. Typical understory species include buckeye, pawpaw, American bladdernut and wild hydrangea.

The ground flora has many spring ephemerals and other shade loving herbaceous plant species. In addition, the limestone rocks and boulders provide habitat for a variety of mosses, lichens, liverwort and ferns, as well as reptiles and amphibians.

In addition, Talus Footslope Forests are subject to occasional disturbances from wind and ice, which periodically open the canopy up by knocking over trees or breaking substantial branches of canopy trees. In addition, the rock masses actively move downward, sometimes causing damage and slumping of trees and other woody vegetation.

Because of the steepness and rocky nature of the substrate, domestic grazing has not had any impact on most of these sites. These ecological sites are moderately productive sites. Because these sites tend to be somewhat isolated and rocky, timber harvesting is somewhat limited. Single tree selection timber harvests are common in this type of community 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 species and increase vigor on the residual trees.

Reference State Plant Community

Canopy Trees

Common Name	Botanical Name	Cover % (low-high)	Canopy Height (ft)
CHINKAPIN OAK	*Quercus muehlenbergii*	5-20	70
BLACK WALNUT	*Juglans nigra*	5-10	80
SUGER MAPLE	*Acer saccharum*	5-20	80
AMERICAN BASSWOOD	*Tilia americana*	5-20	90
NORTHERN RED OAK	*Quercus rubra*	5-20	90
BITTERNUT HICKORY	*Carya cordiformis*	5-20	80
WHITE ASH	*Fraxinus americana*	5-20	80

Understory Trees

Common Name	Botanical Name	Cover % (low-high)	Canopy Height (ft)
PAWPAW	*Asimina triloba*	10-20	20
OHIO BUCKEYE	*Aesculus glabra*	10-20	30

Shrubs

Common Name	Botanical Name	Cover % (low-high)	Canopy Height (ft)
AMERICAN BLADDERNUT	*Staphylea trifolia*	5-20	12
WILD HYDRANGEA	*Hydrangea arborescens*	5-20	5

Ferns

Common Name	Botanical Name	Cover % (low-high)
BULBET FERN	*Cystopteris bulbifera*	5-10
WALKING FERN	*Asplenium rhizophyllum*	5-10
NORTHERN MAIDENHAIR FERN	*Adiantum pedatum*	5-10
BRITTLE BLADDER FERN	*Cystopteris fragilis*	

Forbs

Common Name	Botanical Name	Cover % (low-high)
SPOTTED TOUCH ME NOT	*Impatiens capensis*	5-10
CLEARWEED	*Pilea pumila*	5-10
TASSEL FLOWER	*Brickrellia grandiflora*	5-10
WOOLEN BREECHES	*Hydrophyllum appendiculatum*	5-10
LEAF CUP	*Polymnia canadensis*	5-10
GOOSEFOOT	*Chenopodium standleyanum*	5-10
WILD SARSAPARILLA	*Aralia nudicaulis*	5-10
SHARP-LOBED HEPATICA	*Hepatica nobilis var. acuta*	5-10
DWARF LARKSPUR	*Delphinium tricorne*	5-10
MAPLE LEAF GOOSEFOOT	*Chenopodium simplex*	5-10
JUMPSEED	*Polygonum virginianum*	5-10
SOFT AGRIMONY	*Agrimonia pubescens*	5-10
BLOODROOT	*Sanguinaria canadensis*	5-10
GOLDENSEAL	*Hydrastis canadensis*	5-10
SHINNING BEDSTRAW	*Galium concinnum*	5-10
SOLOMON'S SEAL	*Smilacena racemosa*	5-10

Site Interpretations

Wildlife

- Compositional diversity and cool, moist conditions make this an important habitat for many bird and amphibian species.
- This upland forest type adds species diversity and coarse woody debris loads making it very important for a number of songbirds and amphibians.
- These forests can provide good "old-growth" conditions with large diameter trees and snags and downed, dead wood.
- Land snails in Missouri utilize the moist leaf litter habitat of this community type, especially where associated with limestone or dolomite talus and outcrops on toe slopes and contact zones with creek valley bottoms.
- Bird species associated with late-successional sites include Wood Thrush, Hooded Warbler, Acadian Flycatcher, Kentucky Warbler, Pileated Woodpecker, Northern Parula, Louisiana Water thrush (near streams), Cerulean Warbler (large trees near streams), and Barred Owl (near streams).
- Reptile and amphibian species associated with these forests include: ringed salamander, spotted salamander, marbled salamander, central newt, four-toed salamander, western slimy salamander, western worm snake, northern red- bellied snake, pickerel frog, and wood frog.

Forestry

- Management: Site index values are can be highly variable, ranging from 47 to 70. Productivity can be high, especially on protected slopes. Limited timber management opportunities may exist because of access issues. Where access is not a problem, uneven-aged management using single tree selection or small group selection cuttings of ½ to 1 acre are options that can be used. These sites are valuable for wildlife purposes and watershed protection. Large rock fragments and boulders increase windthrow hazards. Avoid constructing harvesting trails and landing sites in these areas.

- Limitations: Surface rock and boulders; slumping and rock movements. Surface rocks and boulders are problems for efficient and safe equipment operation. Machine planting and mechanical site preparation is not recommended. Surface rock and boulders may interfere with equipment operation. Boulders may cause breakage of timber when harvesting. Rock and boulder movement may create hazardous site working conditions.

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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