

Ecological site F134XY002MO Deep Loess Protected Backslope Forest

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General information

Provisional. A provisional ecological site description has undergone quality control and quality assurance review. It contains a working state and transition model and enough information to identify the ecological site.



Figure 1. Mapped extent

Areas shown in blue indicate the maximum mapped extent of this ecological site. Other ecological sites likely occur within the highlighted areas. It is also possible for this ecological site to occur outside of highlighted areas if detailed soil survey has not been completed or recently updated.

MLRA notes

Major Land Resource Area (MLRA): 134X–Southern Mississippi Valley Loess

The Southern Mississippi Valley Loess (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.

Classification relationships

Terrestrial Natural Community Type in Missouri (Nelson, 2010):

The reference state for this ecological site is most similar to a Mesic Loess/Glacial Till Forest.

Missouri Department of Conservation Forest and Woodland Communities (Missouri Department of Conservation, 2006):

The reference state for this ecological site is most similar to a Mixed Hardwood Mesic Forest.

National Vegetation Classification System Vegetation Association (NatureServe, 2010):

The reference state for this ecological site is most similar to a *Quercus (rubra, alba, velutina) / Acer barbatum / Asimina triloba* Forest (CEGL004069).

Geographic relationship to the Missouri Ecological Classification System (Nigh & Schroeder, 2002):
 This Ecological Site occurs in the Crowley's Ridge Subsection, and in the Benton Loess Woodland/Forest Hills Land Type Association of the Ozark Outer Border Subsection.

Ecological site concept

Deep Loess Protected Backslope Forests are within the green areas on the map (Missouri portion only; distributions farther south are currently under review). They occupy the northerly and easterly aspects of steep, dissected slopes, and are mapped in complex with the Deep Loess Exposed Backslope Woodland ecological site. These sites are common in Scott county, Missouri, and on the easternmost uplands of Crowley's Ridge in Stoddard county, Missouri. Soils are very deep, with no rooting restrictions. The reference plant community is forest dominated by northern red oak, white oak, and tulip poplar, with minor amounts of sugar maple, a well-developed understory and a rich herbaceous ground flora.

Table 1. Dominant plant species

Tree	(1) <i>Fagus grandifolia</i> (2) <i>Liriodendron tulipifera</i>
Shrub	(1) <i>Asimina triloba</i> (2) <i>Aesculus pavia</i>
Herbaceous	(1) <i>Sanguinaria canadensis</i> (2) <i>Trillium</i>

Physiographic features

This site is on upland backslopes, with slopes of %. It is on protected aspects (north, northeast, and east), which receive significantly less solar radiation than the exposed aspects. The site receives runoff from upslope summit and shoulder sites, and generates runoff to adjacent, downslope ecological sites. This site does not flood. The adjacent figure (adapted from Butler, 1985) shows the typical landscape position of this ecological site, and landscape relationships with other ecological sites. It is within the area labeled "1" on the figure, on lower backslopes with northerly to easterly exposures. Deep Loess Exposed Backslope Woodland sites are on the corresponding southerly to westerly exposures. Upper slopes and summits within the area are in the Deep Loess Upland Woodland ecological site. Fragipan Upland Woodland sites, labeled "2" on the figure, are closely associated with the Deep Loess sites.

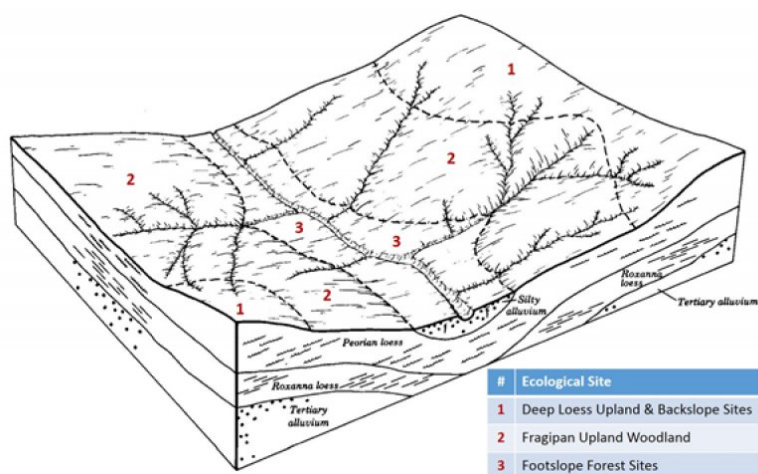


Figure 2. Typical landscape relationships for this ecological site

Table 2. Representative physiographic features

Landforms	(1) Hill
Flooding frequency	None

Ponding frequency	None
Slope	15–35%
Aspect	N, NE, E

Climatic features

Table 3. Representative climatic features

Frost-free period (characteristic range)	164-168 days
Freeze-free period (characteristic range)	193-196 days
Precipitation total (characteristic range)	1,194 mm
Frost-free period (actual range)	162-170 days
Freeze-free period (actual range)	192-197 days
Precipitation total (actual range)	1,194 mm
Frost-free period (average)	166 days
Freeze-free period (average)	195 days
Precipitation total (average)	1,194 mm

Climate stations used

- (1) CAPE GIRARDEAU MUNI AP [USW00003935], Chaffee, MO
- (2) ADVANCE 1 S [USW00093825], Advance, MO

Influencing water features

Soil features

These soils have no major rooting restriction. The soils were formed under woodland vegetation, and have thin, light-colored surface horizons. Parent material is loess. The soils have silt loam surface horizons. Subsoils are silt loam to silty clay loam. These soils are not affected by seasonal wetness. Soil series associated with this site include Memphis.

The accompanying picture of the Memphis series shows a dark grayish brown silt loam surface horizon to about 18 cm overlying the brown silt loam to silty clay loam subsoil. Pale silt coats on structural prism faces can be seen below one meter in this picture. Picture courtesy of Kevin Godsey and Dan Childress; scale is in centimeters.



Figure 9. Memphis series

Table 4. Representative soil features

Surface texture	(1) Silt loam
Family particle size	(1) Loamy
Drainage class	Well drained
Permeability class	Moderately slow
Surface fragment cover <=3"	0%
Surface fragment cover >3"	0%
Available water capacity (0-101.6cm)	20.32–22.86 cm
Calcium carbonate equivalent (0-101.6cm)	0%
Electrical conductivity (0-101.6cm)	0–2 mmhos/cm
Sodium adsorption ratio (0-101.6cm)	0
Soil reaction (1:1 water) (0-101.6cm)	4.5–6
Subsurface fragment volume <=3" (Depth not specified)	0%
Subsurface fragment volume >3" (Depth not specified)	0%

Ecological dynamics

State and transition model

Ecosystem states

1. Mesic Loess/Glacial
Till Forest

2. dry-Mesic
Loess/Glacial Till
Woodland

State 1 submodel, plant communities

1.1. Sugar Maple-Black
Maple-Basswood-Red
Oak/Hornbeam Forest

State 2 submodel, plant communities

2.1. Sugar Maple-Black
Maple-Basswood-Red
Oak/Hornbeam Forest

State 1

Mesic Loess/Glacial Till Forest

Community 1.1

Sugar Maple-Black Maple-Basswood-Red Oak/Hornbeam Forest



Figure 10. Hart Creek Conservation Area, MDC, Boone Co.

State 2

dry-Mesic Loess/Glacial Till Woodland

Community 2.1

Sugar Maple-Black Maple-Basswood-Red Oak/Hornbeam Forest

Additional community tables

Table 5. Community 1.1 forest overstory composition

Common Name	Symbol	Scientific Name	Nativity	Height (M)	Canopy Cover (%)	Diameter (Cm)	Basal Area (Square M/Hectare)
Tree							
northern red oak	QURU	<i>Quercus rubra</i>	Native	–	–	–	–
sugar maple	ACSA3	<i>Acer saccharum</i>	Native	–	–	–	–
black maple	ACNI5	<i>Acer nigrum</i>	Native	–	–	–	–
American basswood	TIAM	<i>Tilia americana</i>	Native	–	–	–	–

Table 6. Community 1.1 forest understory composition

Common Name	Symbol	Scientific Name	Nativity	Height (M)	Canopy Cover (%)
Shrub/Subshrub					
hophornbeam	OSVI	<i>Ostrya virginiana</i>	Native	–	–

Table 7. Community 2.1 forest overstory composition

Common Name	Symbol	Scientific Name	Nativity	Height (M)	Canopy Cover (%)	Diameter (Cm)	Basal Area (Square M/Hectare)
Tree							
white oak	QUAL	<i>Quercus alba</i>	Native	–	–	–	–
shagbark hickory	CAOV2	<i>Carya ovata</i>	Native	–	–	–	–

Table 8. Community 2.1 forest understory composition

Common Name	Symbol	Scientific Name	Nativity	Height (M)	Canopy Cover (%)
Grass/grass-like (Graminoids)					
Pennsylvania sedge	CAPE6	<i>Carex pensylvanica</i>	Native	–	–

Other references

Butler, E. Rex. 1985. Soil Survey of Stoddard County, Missouri. U.S. Dept. of Agric. Soil Conservation Service.

Contributors

Fred Young

Rangeland health reference sheet

Interpreting Indicators of Rangeland Health is a qualitative assessment protocol used to determine ecosystem condition based on benchmark characteristics described in the Reference Sheet. A suite of 17 (or more) indicators are typically considered in an assessment. The ecological site(s) representative of an assessment location must be known prior to applying the protocol and must be verified based on soils and climate. Current plant community cannot be used to identify the ecological site.

Author(s)/participant(s)	
Contact for lead author	
Date	
Approved by	
Approval date	
Composition (Indicators 10 and 12) based on	Annual Production

Indicators

1. **Number and extent of rills:**

2. **Presence of water flow patterns:**

3. **Number and height of erosional pedestals or terracettes:**

4. **Bare ground from Ecological Site Description or other studies (rock, litter, lichen, moss, plant canopy are not bare ground):**

-
5. **Number of gullies and erosion associated with gullies:**
-
6. **Extent of wind scoured, blowouts and/or depositional areas:**
-
7. **Amount of litter movement (describe size and distance expected to travel):**
-
8. **Soil surface (top few mm) resistance to erosion (stability values are averages - most sites will show a range of values):**
-
9. **Soil surface structure and SOM content (include type of structure and A-horizon color and thickness):**
-
10. **Effect of community phase composition (relative proportion of different functional groups) and spatial distribution on infiltration and runoff:**
-
11. **Presence and thickness of compaction layer (usually none; describe soil profile features which may be mistaken for compaction on this site):**
-
12. **Functional/Structural Groups (list in order of descending dominance by above-ground annual-production or live foliar cover using symbols: >>, >, = to indicate much greater than, greater than, and equal to):**
- Dominant:
- Sub-dominant:
- Other:
- Additional:
-
13. **Amount of plant mortality and decadence (include which functional groups are expected to show mortality or decadence):**
-
14. **Average percent litter cover (%) and depth (in):**
-
15. **Expected annual annual-production (this is TOTAL above-ground annual-production, not just forage annual-production):**
-

16. **Potential invasive (including noxious) species (native and non-native).** List species which BOTH characterize degraded states and have the potential to become a dominant or co-dominant species on the ecological site if their future establishment and growth is not actively controlled by management interventions. Species that become dominant for only one to several years (e.g., short-term response to drought or wildfire) are not invasive plants. Note that unlike other indicators, we are describing what is NOT expected in the reference state for the ecological site:
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17. **Perennial plant reproductive capability:**
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