USDA Natural Resources
Conservation Service

Ecological site F115XB061MO
Anthropic Deep Loess Upland

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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.

MLRA notes

Major Land Resource Area (MLRA): 115X–Central Mississippi Valley Wooded Slopes

This MLRA is characterized by deeply dissected, loess-covered hills bordering well defined valleys of the Illinois, Mississippi, Missouri, Ohio, and Wabash Rivers and their tributaries. It is used to produce cash crops and livestock. About one-third of the area is forested, mostly on the steeper slopes. This area is in Illinois (50 percent), Missouri (36 percent), Indiana (13 percent), and Iowa (1 percent) in two separate areas. It makes up about 25,084 square miles (64,967 square kilometers).

Most of this area is in the Till Plains section and the Dissected Till Plains section of the Central Lowland province of the Interior Plains. The Springfield-Salem plateaus section of the Ozarks Plateaus province of the Interior Highlands occurs along the Missouri River and the Mississippi River south of the confluence with the Missouri River. The nearly level to very steep uplands are dissected by both large and small tributaries of the Illinois, Mississippi, Missouri, Ohio, and Wabash Rivers. The Ohio River flows along the southernmost boundary of this area in Indiana. Well defined valleys with broad flood plains and numerous stream terraces are along the major streams and rivers. The flood plains along the smaller streams are narrow. Broad summits are nearly level to undulating. Karst topography is common in some parts along the Missouri and Mississippi Rivers and their tributaries. Well-developed karst areas have hundreds of sinkholes, caves, springs, and losing streams. In the St. Louis area, many of the karst features have been obliterated by urban development.

Elevation ranges from 90 feet (20 meters) on the southernmost flood plains to 1,030 feet (320 meters) on the highest ridges. Local relief is mainly 10 to 50 feet (3 to 15 meters) but can be 50 to 150 feet (15 to 45 meters) in the steep, deeply dissected hills bordering rivers

and streams. The bluffs along the major rivers are generally 200 to 350 feet (60 to 105 meters) above the valley floor.

The uplands in this MLRA are covered almost entirely with Peoria Loess. The loess can be more than 7 feet (2 meters) thick on stable summits. On the steeper slopes, it is thin or does not occur. In Illinois, the loess is underlain mostly by Illinoian-age till that commonly contains a paleosol. Pre-Illinoian-age till is in parts of this MLRA in Iowa and Missouri and to a minor extent in the western part of Illinois. Wisconsin-age outwash, alluvial deposits, and sandy eolian material are on some of the stream terraces and on dunes along the major tributaries. The loess and glacial deposits are underlain by several bedrock systems. Pennsylvanian and Mississippian bedrock are the most extensive. To a lesser extent are Silurian, Devonian, Cretaceous, and Ordovician bedrock. Karst areas have formed where limestone is near the surface, mostly in the southern part of the MLRA along the Mississippi River and some of its major tributaries. Bedrock outcrops are common on the bluffs along the Mississippi, Ohio, and Wabash Rivers and their major tributaries and at the base of some steep slopes along minor streams and drainageways.

The annual precipitation ranges from 35 to 49 inches (880 to 1,250 millimeters) with a mean of 41 inches (1,050 millimeters). The annual temperature ranges from 48 to 58 degrees F (8.6 to 14.3 degrees C) with a mean of 54 degrees F (12.3 degrees C). The freeze-free period ranges from 150 to 220 days with a mean of 195 days.

Soils The dominant soil orders are Alfisols and, to a lesser extent, Entisols and Mollisols. The soils in the area have a mesic soil temperature regime, an aquic or udic soil moisture regime, and mixed or smectitic mineralogy. They are shallow to very deep, excessively drained to poorly drained, and loamy, silty, or clayey.

The soils on uplands in this area support natural hardwoods. Oak, hickory, and sugar maple are the dominant species. Big bluestem, little bluestem, and scattered oak and eastern redcedar grow on some sites. The soils on flood plains support mixed forest vegetation, mainly American elm, eastern cottonwood, river birch, green ash, silver maple, sweetgum, American sycamore, pin oak, pecan, and willow. Sedge and grass meadows and scattered trees are on some low-lying sites. (United States Department of Agriculture, Natural Resources Conservation Service, 2022)

LRU notes

The Central Mississippi Valley Wooded Slopes, Western Part consists of deeply dissected, loess-covered hills bordering the Missouri and Mississippi Rivers as well as floodplains and terraces of these rivers. The Northern boundary runs along the South Fabius River valley separating it from the broad rounded interfluves of the northern till plain. A major physiographic feature within the LRU (Land Resource Unit) includes the Lincoln Hills region. The Lincoln Hills extend along the Mississippi River in Missouri, starting about 40 miles (64 kilometers) northwest of St. Louis and extending north to Hannibal. The Lincoln Hills partially escaped the most recent glaciation in the region

during the Pleistocene. In geology and biology, they resemble the rugged and forested hills of the Ozark Highlands (MLRA 116A) more than the rolling plains of northern Missouri. The underlying limestone bedrock has formed bluffs, glades, caves, springs, and sinkholes. Elevation ranges from about 420 feet (128 meters) along the Mississippi River near Cape Girardeau, Missouri to about 830 feet (253 meters) near Clarksville along the Mississippi River upstream from St. Louis. High ridges near Hillsboro, Missouri can reach over 1,000 feet (305 meters). Underlying bedrock is mainly Ordovician-aged dolomite and sandstone, with Mississippian-aged limestone north of the Missouri River. Loess caps both stream and glacial outwash terraces along the major rivers along with Pre-Illinoisan till near the edges of the area.

Classification relationships

Major Land Resource Area (MLRA) (USDA-NRCS, 2022):
115X–Central Mississippi Valley Wooded Slopes

Geographic relationship to the Missouri Ecological Classification System (Nigh and Schroeder, 2002): This ecological site is distributed in the Ozark Highlands Section, Outer Ozark Border (OZ12) and the Inner Ozark Border Subsections (OZ13).

Ecological site concept

Anthropic Deep Loess Uplands are widely dispersed on upland sites on anthropogenic landforms in urban areas in and around urban areas such as St. Louis, Jefferson City and Columbia, Missouri where human-transported materials have been placed over buried upland loess derived soils. Soils that characterize this site are very deep, have a silty subsoil, may have a high water table in spring months, and are not subject to flooding. In similar historic settings prior to anthropogenic developments, the native vegetation was dominated by a wide variety of upland woodland species, such as white oak and black oak. These sites have been highly altered in place or associated soils transported from one location to another. Anthropic Deep Loess Uplands are currently associated with open, non-developed spaces adjacent to residential, commercial and industrial areas, along with parks, playgrounds, golf courses and other non-developed urban areas. The vegetation making up this site is highly variable, ranging from lawn grasses, ornamental shrubs, shade trees to second-growth trees and shrubs. Invasive species are common on this site.

Associated sites

F115XB001MO	**Deep Loess Upland Woodland** Deep Loess Upland Woodlands are on similar landscape positions but lack an anthropic surface horizon.
F115XB003MO	**Deep Loess Protected Backslope Forest** Deep Loess Protected Backslope Forests are downslope on north and east facing slopes.

F115XB043MO	**Deep Loess Exposed Backslope Woodland** Deep Loess Exposed Backslope Woodlands are downslope on south and west facing slopes.

Similar sites

F115XB001MO	**Deep Loess Upland Woodland** Deep Loess Upland Woodlands are on similar landscape positions but lack an anthropic surface horizon.

Table 1. Dominant plant species

Tree	(1) *Quercus alba* (2) *Quercus velutina*
Shrub	(1) *Rhus aromatica* (2) *Amorpha canescens*
Herbaceous	(1) *Schizachyrium scoparium* (2) *Bromus pubescens*

Physiographic features

This site is located on upland summit crests, shoulders, and upper backslopes. Slope ranges from 2 to 20 percent. The Anthropic Deep Loess Upland generates runoff to adjacent, downslope ecological sites. Typical elevation is 125 to 180 meters (410 to 590 feet) above mean sea level. This site is not subject to flooding. The adjacent figure (adapted from Tummons, 1982) shows a typical landscape position of this ecological site and landscape relationships among the major ecological sites of the Missouri and Mississippi river systems. Anthropic Deep Loess Upland is within the area labeled as “2” and is typically adjacent to other upland ecological sites such as Deep Loess Upland Woodland (labeled “1”).

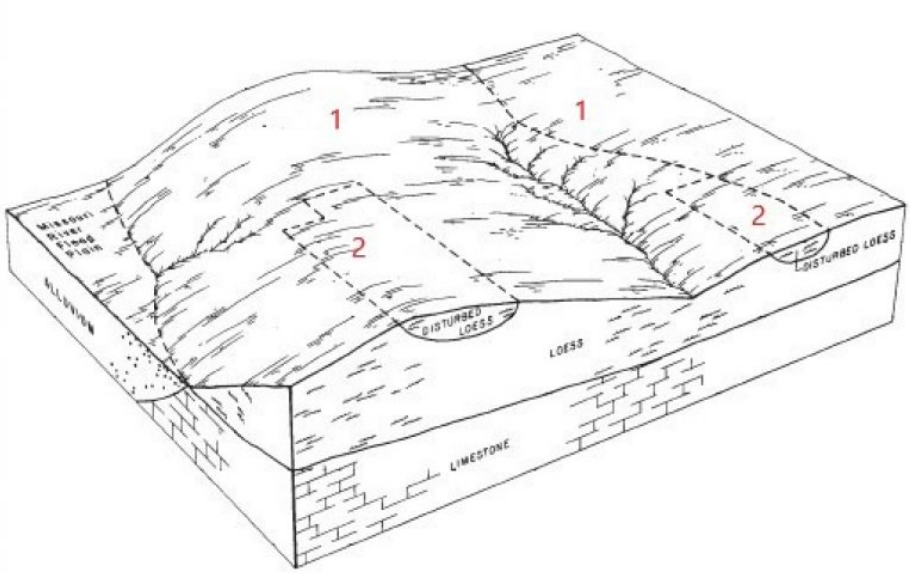


Figure 1. Landscape relationships for this ecological site.

Table 2. Representative physiographic features

Landforms	(1) Upland > Hill (2) Upland > Hillslope (3) Upland > Interfluve
Runoff class	High
Flooding frequency	None
Elevation	125–180 m
Slope	2–20%
Water table depth	61–91 cm
Aspect	Aspect is not a significant factor

Climatic features

The Central Mississippi Valley Wooded Slopes, Western Part has a continental type of climate marked by strong seasonality. In winter, dry-cold air masses, unchallenged by any topographic barriers, periodically swing south from the northern plains and Canada. If they invade reasonably humid air, snowfall and rainfall result. In summer, moist, warm air masses, equally unchallenged by topographic barriers, swing north from the Gulf of Mexico and can produce abundant amounts of rain, either by fronts or by convectional processes. In some summers, high pressure stagnates over the region, creating extended droughty periods. Spring and fall are transitional seasons when abrupt changes in temperature and precipitation may occur due to successive, fast-moving fronts separating contrasting air masses.

The Central Mississippi Valley Wooded Slopes, Western Part experiences regional differences in climates, but these differences do not have obvious geographic boundaries.

Regional climates grade inconspicuously into each other. The basic gradient for most climatic characteristics is along a line diagonally crossing the MLRA from northwest to southeast. Both mean annual temperature and precipitation exhibit gradients along this line. The average annual precipitation in most of this area is 38 to 48 inches. The average annual temperature is 53 to 57 degrees F. Mean January minimum temperature follows the northwest-to-southeast gradient. However, mean July maximum temperature shows hardly any geographic variation in the MLRA. Mean July maximum temperatures have a range of only two or three degrees across the area.

Mean annual precipitation varies along the same gradient as temperature. Seasonal climatic variations are more complex. Seasonality in precipitation is very pronounced due to strong continental influences. June precipitation, for example, averages three to four times greater than January precipitation. Most of the rainfall occurs as high-intensity, convective thunderstorms in summer. Snowfall is common in winter.

During years when precipitation comes in a fairly normal manner, moisture is stored in the top layers of the soil during the winter and early spring, when evaporation and transpiration are low. During the summer months the loss of water by evaporation and transpiration is high, and if rainfall fails to occur at frequent intervals, drought will result. Drought directly affects plant and animal life by limiting water supplies, especially at times of high temperatures and high evaporation rates.

Superimposed upon the basic MLRA climatic patterns are local topographic influences that create topoclimatic, or microclimatic variations. In regions of appreciable relief, for example, air drainage at nighttime may produce temperatures several degrees lower in valley bottoms than on side slopes. At critical times during the year, this phenomenon may produce later spring or earlier fall freezes in valley bottoms. Higher daytime temperatures of bare rock surfaces and higher reflectivity of these unvegetated surfaces may create distinctive environmental niches such as glades and cliffs. Slope orientation is an important topographic influence on climate. Summits and south-and-west-facing slopes are regularly warmer and drier than adjacent north- and-east-facing slopes. Finally, the climate within a canopied forest is measurably different from the climate of a more open grassland or savanna areas.

Source: University of Missouri Climate Center - http://climate.missouri.edu/climate.php; accessed June 2012

Land Resource Regions and Major Land Resource Areas of the United States, the Caribbean, and the Pacific Basin, United States Department of Agriculture Handbook 296 - http://soils.usda.gov/survey/geography/mlra/

Table 3. Representative climatic features

Frost-free period (characteristic range)	176-195 days
Freeze-free period (characteristic range)	198-211 days

Precipitation total (characteristic range)	1,067-1,092 mm
Frost-free period (actual range)	169-197 days
Freeze-free period (actual range)	194-213 days
Precipitation total (actual range)	1,041-1,092 mm
Frost-free period (average)	185 days
Freeze-free period (average)	204 days
Precipitation total (average)	1,067 mm

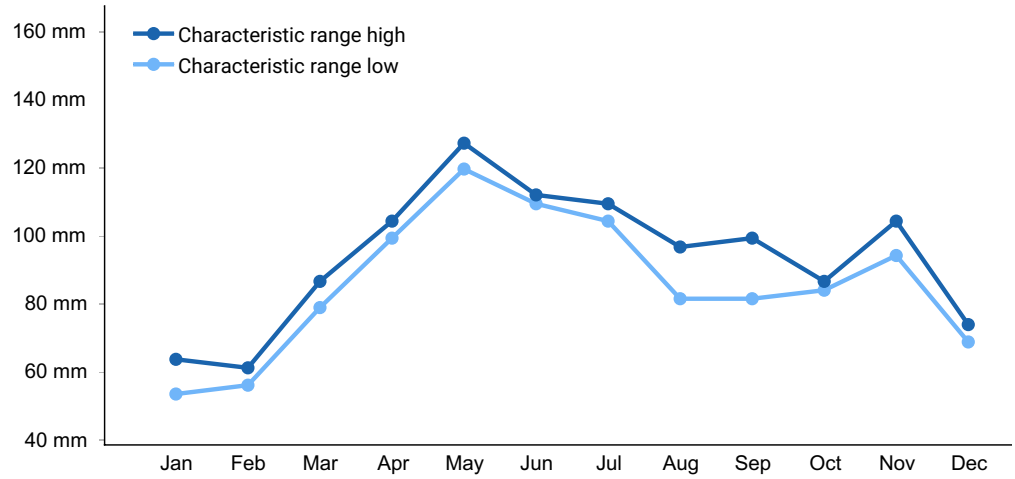


Figure 2. Monthly precipitation range

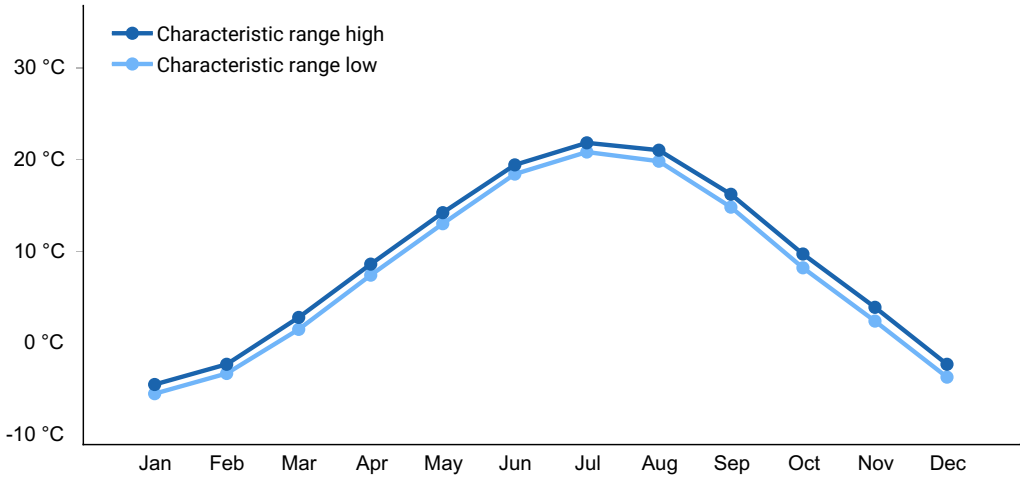


Figure 3. Monthly minimum temperature range

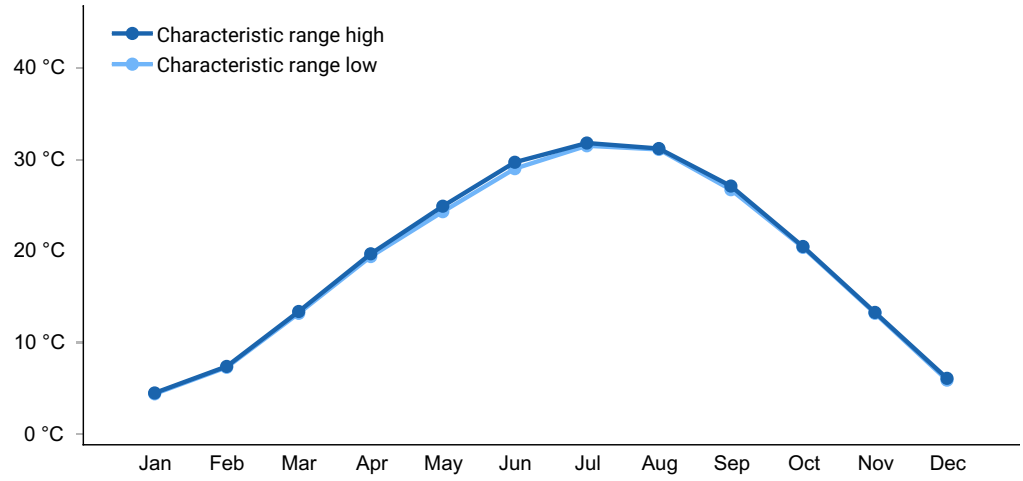


Figure 4. Monthly maximum temperature range

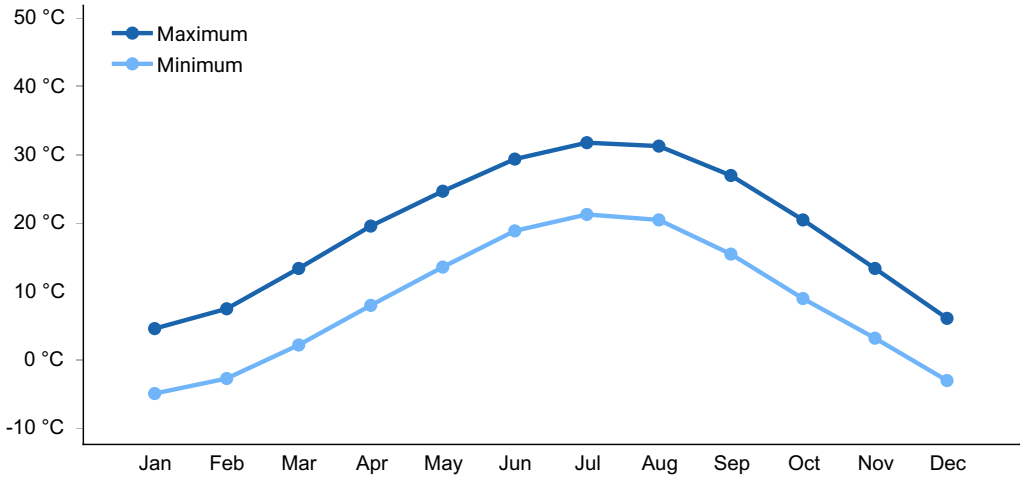


Figure 5. Monthly average minimum and maximum temperature

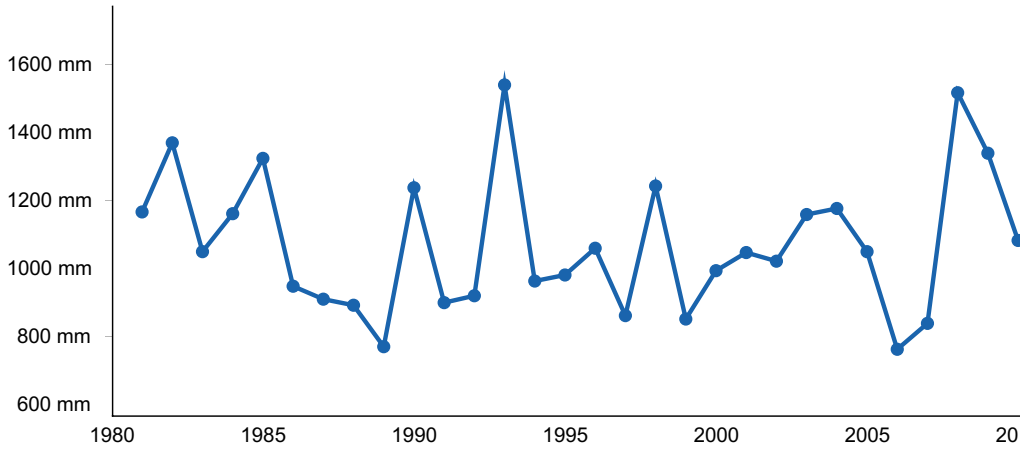


Figure 6. Annual precipitation pattern

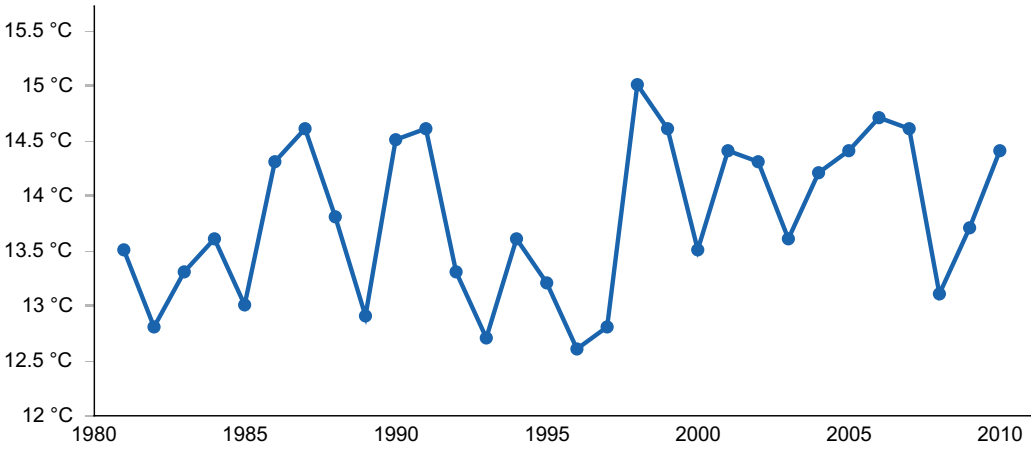


Figure 7. Annual average temperature pattern

Climate stations used

- (1) ST LOUIS SCI CTR [USC00237452], Saint Louis, MO
- (2) ST LOUIS LAMBERT INTL AP [USW00013994], Saint Louis, MO
- (3) JEFFERSON CITY WTP [USC00234271], Jefferson City, MO

Influencing water features

The water features of this upland ecological site include evapotranspiration, surface runoff, and drainage. Each water balance component fluctuates to varying extents from year-to-year. Precipitation and drainage may be highly variable between years. Seasonal variability differs for each water component. Precipitation generally occurs as single day events. Evapotranspiration is lowest in the winter and peaks in the summer. The surface runoff pulse is greatly influenced by extreme events. High intensity land uses tend to increase runoff, but also decreases evapotranspiration. Depending on the situation, this might increase runoff discharge, and decrease baseflow in receiving streams.

Soil features

This site is located on upland anthropogenic landforms in urban areas where human-transported materials have been placed over areas of loess deposits that have been graded and reshaped for urban development. The amount of filling, cutting, and alteration of existing soil is geographically variable. This soil has no rooting restriction. The parent material is loess and consists of a very deep, moderately drained soil that formed in up to 101 centimeters (40 inches) of human-transported material over truncated upland loess soils that were formed under woodland vegetation. Thickness of the human-transported material ranges from 50 to 101 centimeters (19.7 to 40 inches). Depth to the top of an apparent seasonal high-water table ranges from 60 to 91 centimeters (24 to 36 inches) between November and May in normal years. Permeability is moderately slow. Drainage is moderately well drained. The only soil series associated with this site is Harvester (Taxonomic Class: Fine-silty, mixed, superactive, nonacid, mesic Oxyaquic Udorthents).

Table 4. Representative soil features

Parent material	(1) Loess (2) Earth spread deposits
Surface texture	(1) Silt loam
Drainage class	Moderately well drained
Permeability class	Moderately slow
Soil depth	203 cm
Surface fragment cover <=3"	0%
Surface fragment cover >3"	0%
Available water capacity (0-101.6cm)	17.78–20.32 cm
Electrical conductivity (0-101.6cm)	0–2 mmhos/cm
Soil reaction (1:1 water) (0-101.6cm)	5.3–7.1
Subsurface fragment volume <=3" (30.5-101.6cm)	0–3%
Subsurface fragment volume >3" (0cm)	Not specified

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, if it exists, 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.

Anthropic Deep Loess Uplands are located on upland anthropogenic landforms in and near urbanized areas and formed in human-transported material. Anthropic Deep Loess Uplands are currently associated with open, non-developed spaces adjacent to residential, commercial and industrial areas, along with parks, playgrounds, golf courses and other non-developed areas.

Due to anthropogenic activity, the historic native vegetation has been removed and soils have either been altered in place or transported from one location to another. Current

vegetation is highly variable, ranging from lawn and turf grasses, ornamental shrubs, shade trees to second growth trees and shrubs. Invasive, non-native plants are also common and include species such as amur honeysuckle (*Lonicera maackii*) , Callery pear (*Pyrus calleryana*); common buckthorn (*Rhamnus cathartica*), garlic mustard, (*Alliaria petiolata*) purple loosestrife (*Lythrum salicaria*), tall fescue, (*Schedonorus arundinaceus*), and sweet clover (Melilotus spp.).

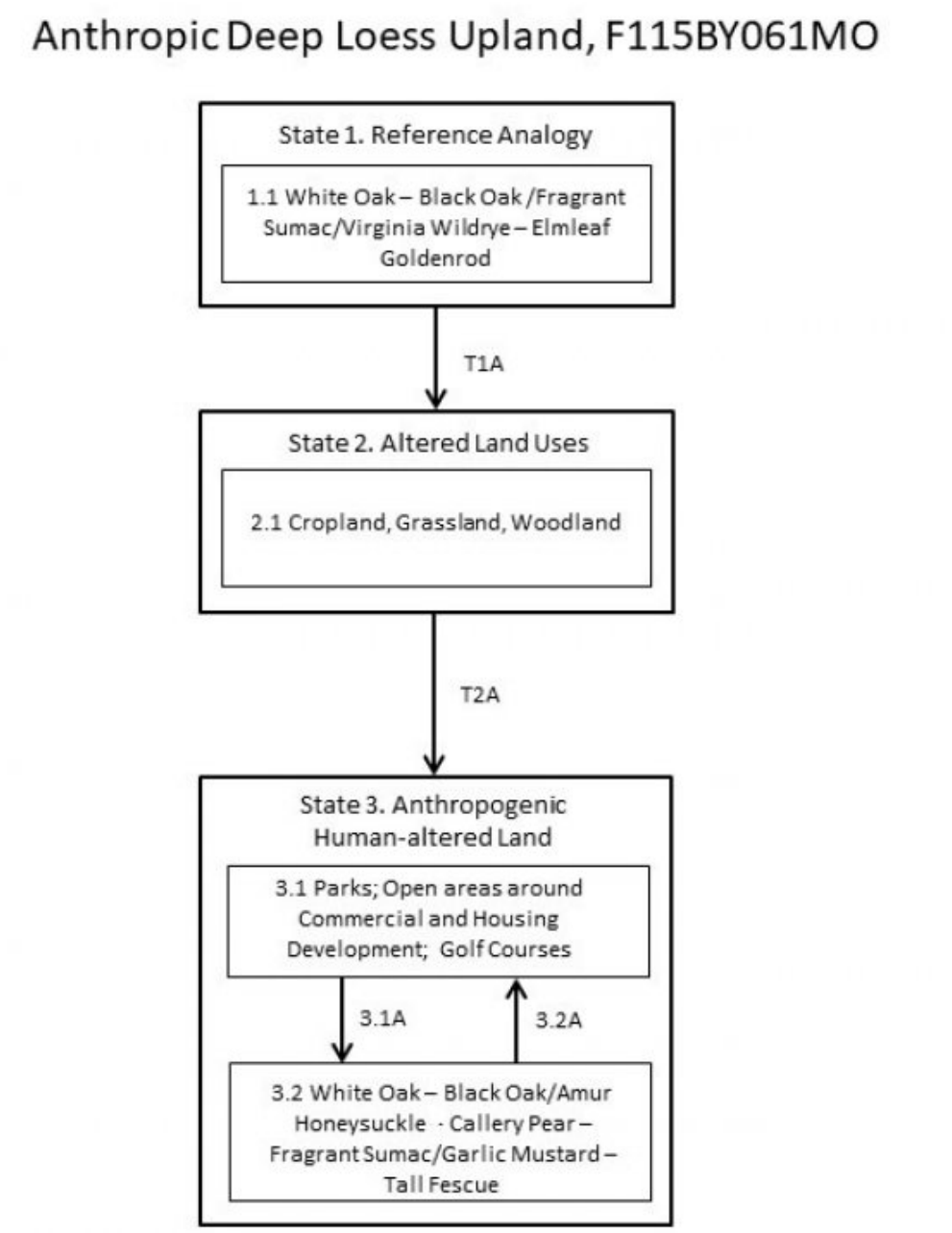
Urban ecosystem services are related to the diversity of “functional groups” of species in a system, that pollinate, graze, predate, fix nitrogen, spread seeds, decompose, generate soils, modify water flows, open up patches for reorganization, and contribute to the colonization of such patches. In urban areas, such functional groups may be substantially reduced in size or show changes in the composition due to high species turnover, both of which may increase vulnerability in maintaining ecosystem services. The extent that invasive species reduce or enhance the flow of ecosystem services is relatively unknown for urban areas. Since, invasive species may make up a large proportion of urban communities, invasive species may certainly be detrimental, but may also enhance local diversity and maintain some important functional roles, such as watershed protection and wildlife habitat (Elmqvist et.al., 2008).

Historically, in similar native settings, an analogous ecological site, Deep Loess Upland Woodland, once existed. This reference plant community was a well-developed woodland dominated by an overstory of white oak (*Quercus alba*), along with black oak (*Quercus velutina*) and an occasional post oak (*Quercus stellata*). The canopy was tall with a moderately open canopy. This woodland community had a two-tiered structure with an open understory and a dense, diverse herbaceous ground flora of grasses and forbs such as Virginia wildrye (*Elymus virginicus*), big bluestem (*Andropogon gerardii*), sedge (Carex spp.), elmleaf goldenrod (*Solidago ulmifolia*), hairy sunflower (*Helianthus hirsutus*) and ticktrefoil (Desmodium spp.). Periodic disturbances including fire, ice and wind created canopy gaps, allowing white oak and black oak to successfully reproduce and remain in the canopy.

Today, where former Deep Loess Upland Woodlands have been converted to anthropogenic landforms that include associated open, non-developed spaces adjacent to residential, commercial and industrial areas, along with parks, playgrounds, golf courses and other non-developed areas, Anthropic Deep Loess Upland sites now exist.

A State-and-Transition Diagram follows. Detailed descriptions of each state, transition, plant community, and pathway follow the model. This model is based on available experimental research, field observations, professional consensus, and interpretations. It is likely to change as knowledge increases.

State and transition model



Code	Event/Activity/Process
T1A	Timber harvesting; clearing; tillage, cropping system; vegetative seeding; grassland management
T2A	Cleared and developed for human use and inhabitation; upland loess derived soils have been buried and modified with human-transported materials
3.1A	No disturbance; idle land (non-impervious surfaces) (20+ years); natural reseeding; invasive species common
3.2A	Disturbance and clearing; vegetative seeding and planting

Figure 8. State-and-transition diagram for this ecological site.

State 1
Reference Analogy

Figure 9. Example of unaltered reference Deep Loess Upland Woodland site

A reference state for this ecological site does not now exist. However, historically, in similar native settings, an analogous ecological site, Deep Loess Upland Woodland, once existed and was a well-developed woodland dominated by an overstory of white oak, along with black oak and an occasional post oak. This state is now highly altered and can no longer be restored.

Dominant plant species

- white oak (*Quercus alba*), tree
- black oak (*Quercus velutina*), tree
- fragrant sumac (*Rhus aromatica*), shrub
- leadplant (*Amorpha canescens*), shrub
- New Jersey tea (*Ceanothus americanus*), shrub
- little bluestem (*Schizachyrium scoparium*), grass
- hairy woodland brome (*Bromus pubescens*), grass
- sedge (*Carex*), grass
- Virginia wildrye (*Elymus submuticus*), grass
- elmleaf goldenrod (*Solidago ulmifolia*), other herbaceous
- hairy sunflower (*Helianthus hirsutus*), other herbaceous
- eastern purple coneflower (*Echinacea purpurea*), other herbaceous
- ticktrefoil (*Desmodium*), other herbaceous

Community 1.1
White Oak – Black Oak /Fragrant Sumac/Virginia Wildrye – Elmleaf Goldenrod

Land in this community phase had an overstory that was dominated by white oak and

black oak with hickory and post oak also present. This woodland community had a two-tiered structure with an open understory and a dense, diverse herbaceous ground flora. Periodic disturbances including fire, ice and wind created canopy gaps, allowing white oak and black oak to successfully reproduce and remain in the canopy.

State 2
Altered Land Use

Figure 10. Example of timber harvesting on former reference site

Figure 11. Example of converting to cropland

This state occurs when the historical reference state is altered through timber harvesting or clearing with tillage, cropping systems, vegetative seeding, grassland management, implemented creating cropland, grassland, and second growth woodland. This state is now highly altered as the result of intensive human activity.

Community 2.1

Cropland, Grassland, Woodland

Land in this community phase had an existing land use of cropland, grassland, or second growth woodland.

State 3
Anthropogenic (Human-altered land)

Figure 12. Anthropic Deep Loess Upland ecological site associated with open non-impervious areas such as Clayton, MO.

Figure 13. Anthropic Deep Loess Upland ecological site associated with open non-impervious areas such as golf courses.

This anthropogenic state occurs when the altered land use state is cleared and developed for intensive human use and inhabitation, such as commercial and housing developments, parks, golf courses, and earthen spoils. The vegetation has been removed when present and soils have either been altered in place or transported from one location to another. Most of the soils in this state have 60 to 122 cm (2 to 4 feet) of overburden on top of the natural soil. This natural material can be determined by observing a buried surface

horizon or the unaltered subsoil, till, or alluvial parent materials. When areas have been idle for several years natural reseeding can occur, and second-growth forests may develop. This state can be considered a replacement community and will not transition back to the reference analogy state or altered land use state. Two community phases are recognized in this state, with shifts between phases based on disturbance/idle frequency.

Community 3.1
Parks; Open areas around Commercial and Housing Development; Golf Courses

Figure 14. Clayton, MO skyline; typical urban landscape setting for this state; photo credit St. Louis Tourism

Figure 15. Forest Park golf course, St. Louis, MO; typical urban landscape setting for this state; photo credit Forest Park Forever

Land in this community phase has had the existing land use of cropland, grassland, or woodland soils heavily re-worked in support of human development projects such as city parks, golf courses, and commercial and housing developments.

Community 3.2
White Oak – Black Oak/Amur Honeysuckle – Callery Pear – Fragrant Sumac/Garlic Mustard – Tall Fescue

Land in this community phase has reverted to second-growth woodlands. This phase typically ensues when altered non-impervious surfaces have been idle for 20 or more years and naturally reseeding has occurred. Species composition is highly variable and dependent upon local seed sources. Common species associated with this phase include white oak, hickory, American elm, amur honeysuckle, Callery pear, fragrant sumac, garlic mustard and tall fescue. Invasive non-native species are common. This phase provides wildlife habitat and watershed protection and benefits.

Forest overstory. Forest Overstory Species list is based on field reconnaissance as well as commonly occurring species listed in Nelson 2010; names and symbols are from USDA PLANTS database.

Forest understory. Forest Understory Species list is based on field reconnaissance as well as commonly occurring species listed in Nelson 2010; names and symbols are from USDA PLANTS database.

Pathway P3.1A
Community 3.1 to 3.2

This community pathway is the result of no disturbances (20+ years) and natural reseeding; includes idle land (non-impervious surfaces); invasive species are common.

Pathway P3.2A
Community 3.2 to 3.1

This pathway is the result of disturbances and clearing along with vegetative seeding and planting.

Transition T1A
State 1 to 2

Reference Analogy **Altered Land Use**

This state transitions to state 2 through timber harvesting and clearing; once cleared, activities such as tillage, cropping system, vegetative seeding, and/or grassland management occurs.

Transition T2A
State 2 to 3

Altered Land Use

Anthropogenic (Human-altered land)

This state transitions to state 3 through clearing and development for human use and inhabitation; upland loess derived soils have been buried and modified with human-transported materials.

Additional community tables

Table 5. Community 3.2 forest overstory composition

Common Name	Symbol	Scientific Name	Nativity	Height (M)	Canopy Cover (%)	Diameter (Cm)	Basal Area (Square M/Hectare)
Tree							
white oak	QUAL	*Quercus alba*	Native	–	–	–	–
black oak	QUVE	*Quercus velutina*	Native	–	–	–	–
mockernut hickory	CATO6	*Carya tomentosa*	Native	–	–	–	–
northern red oak	QURU	*Quercus rubra*	Native	–	–	–	–
shagbark hickory	CAOV2	*Carya ovata*	Native	–	–	–	–
post oak	QUST	*Quercus stellata*	Native	–	–	–	–
American elm	ULAM	*Ulmus americana*	Native	–	–	–	–
shingle oak	QUIM	*Quercus imbricaria*	Native	–	–	–	–

Table 6. Community 3.2 forest understory composition

Common Name	Symbol	Scientific Name	Nativity	Height (M)	Canopy Cover (%)
Grass/grass-like (Graminoids)					
sedge	CAREX	*Carex*	Native	–	–

broomsedge bluestem	ANVI2	*Andropogon virginicus*	Native	–	–
wildrye	ELYMU	*Elymus*	Native	–	–
hairy woodland brome	BRPU6	*Bromus pubescens*	Native	–	–
tall fescue	SCAR7	*Schedonorus arundinaceus*	Introduced	–	–
Johnsongrass	SOHA	*Sorghum halepense*	Introduced	–	–
annual bluegrass	POAN	*Poa annua*	Introduced	–	–
Forb/Herb					
teasel	DIPSA	*Dipsacus*	Introduced	–	–
crownvetch	SEVA4	*Securigera varia*	Introduced	–	–
garlic mustard	ALPE4	*Alliaria petiolata*	Introduced	–	–
purple loosestrife	LYSA2	*Lythrum salicaria*	Introduced	–	–
sericea lespedeza	LECU	*Lespedeza cuneata*	Introduced	–	–
sweetclover	MELIL	*Melilotus*	Introduced	–	–
Virginia bluebells	MEVI3	*Mertensia virginica*	Native	–	–
Canadian blacksnakeroot	SACA15	*Sanicula canadensis*	Native	–	–
Carolina springbeauty	CLCA	*Claytonia caroliniana*	Native	–	–
mayapple	POPE	*Podophyllum peltatum*	Native	–	–
ticktrefoil	DESMO	*Desmodium*	Native	–	–
elmleaf goldenrod	SOUL2	*Solidago ulmifolia*	Native	–	–
hairy sunflower	HEHI2	*Helianthus hirsutus*	Native	–	–
touch-me-not	IMPAT	*Impatiens*	Native	–	–
aster	SYMPH4	*Symphyotrichum*	Native	–	–
smallspike false nettle	BOCY	*Boehmeria cylindrica*	Native	–	–
wild blue phlox	PHDI5	*Phlox divaricata*	Native	–	–
goldenrod	SOLID	*Solidago*	Native	–	–
Shrub/Subshrub					
American bladdernut	STTR	*Staphylea trifolia*	Native	–	–
Amur honeysuckle	LOMA6	*Lonicera maackii*	Introduced	–	–
fragrant sumac	RHAR4	*Rhus aromatica*	Native	–	–
autumn olive	ELUM	*Elaeagnus umbellata*	Introduced	–	–
common buckthorn	RHCA3	*Rhamnus cathartica*	Introduced	–	–
multiflora rose	ROMU	*Rosa multiflora*	Introduced	–	–
Tree					

slippery elm	ULRU	*Ulmus rubra*	Native	–	–
tree of heaven	AIAL	*Ailanthus altissima*	Introduced	–	–
red mulberry	MORU2	*Morus rubra*	Native	–	–
Russian olive	ELAN	*Elaeagnus angustifolia*	Introduced	–	–
Tree Fern					
Callery pear	PYCA80	*Pyrus calleryana*	Introduced	–	–
Vine/Liana					
Virginia creeper	PAQU2	*Parthenocissus quinquefolia*	Native	–	–
eastern poison ivy	TORA2	*Toxicodendron radicans*	Native	–	–
grape	VITIS	*Vitis*	Native	–	–
Japanese honeysuckle	LOJA	*Lonicera japonica*	Introduced	–	–
winter creeper	EUFO5	*Euonymus fortunei*	Introduced	–	–
Oriental bittersweet	CEOR7	*Celastrus orbiculatus*	Introduced	–	–

Animal community

Wildlife (State 3 – Phase 3.2 woody vegetation) (MDC 2006)
Wild turkey, white-tailed deer, and eastern gray squirrel depend on hard and soft mast food sources and are typical upland game species of this type.

Oaks provide hard mast; scattered shrubs provide soft mast.

Legumes provide high-quality wildlife food; sedges and cool-season grasses provide green browse; patchy grasses provide cover and nesting habitat; and a diversity of forbs provides a diversity and abundance of insects.

Bird species associated with mature communities include Indigo Bunting, Red-headed Woodpecker, Eastern Bluebird, Northern Bobwhite, Eastern Wood-Pewee, Broad-winged Hawk, Great-Crested Flycatcher, Summer Tanager, and Red-eyed Vireo.

Reptile and amphibian species associated with this site include tiger salamander, small-mouthed salamander, ornate box turtle, northern fence lizard, five-lined skink, broad-headed skink, flat-headed snake, and rough earth snake.

Other information

Equipment issues (NRCS 2002)
Limitations: Wetness from seasonal high-water table. Use of equipment may be restricted in spring and other excessively wet periods. Restrict activities to dry periods or surfaced

areas. Equipment use when wet may compact soil and damage tree roots. Access to sites is easiest during dry periods or winter when soils are frozen. 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.

Ornamental plantings (USDA-NRCS 2020)
Fragile Soil Index: moderate potential to resist degradation and be resilient; site limitations include poor soil structure due to human-transported materials that lowers the capacity of the soil to resist degradation from accelerated water erosion, along with extremely low organic matter.

Suitability for Aerobic Soil Organisms: some limiting features that are not favorable for aerobic soil organisms; human-transported materials have a low organic matter content required by many soil organisms as an energy and carbon source as well as low bulk density (amount of soil pore space) that influences water and gas movement and physical space for organisms to occupy and the tortuosity (convoluted pathways) of paths through which they have to move.

To make ornamental plantings more successful use management activities such as the use of annual cover crops, mulches, perennial species, and reduced surface disturbance. Additionally, the use of plants with different rooting depths can help break up compacted soil layers.

Inventory data references

No field vegetation plots were available for this site. All community phases are considered provisional based on field reviews and the information identified in this ecological site description.

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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	04/06/2026
Approved by	Suzanne Mayne-Kinney
Approval date	
Composition (Indicators 10 and 12) based on	Annual Production

Indicators

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

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

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

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

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5. **Number of gullies and erosion associated with gullies:**

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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:**

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11. **Presence and thickness of compaction layer (usually none; describe soil profile**

features which may be mistaken for compaction on this site):

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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:**
