USDA Natural Resources Conservation Service

Ecological site F115XA018IL
Wet Clayey Floodplain

Last updated: 12/30/2024
Accessed: 01/10/2025

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 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

Most of this LRU (Land Resource Unit) is in the glaciated Till Plains Section of the Central Lowland Province of the Interior Plains. The southeast corner is in the Highland Rim Section (locally known as the Shawnee Hills Section) of the Interior Low Plateaus Province of the Interior Plains. The nearly level to very steep uplands in this LRU are dissected by both large and small tributaries of the Wabash and Ohio Rivers. 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 gently sloping.

This area is covered almost entirely with Wisconsin loess, also known as 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. The loess throughout the area is underlain dominantly by glacial till. Wisconsin outwash, alluvial deposits, and sandy eolian material are on some of the stream terraces and on dunes along the major tributaries in the area. The loess and glacial drift are underlain by Pennsylvanian-age bedrock. Bedrock outcrops are common in the walls of the valleys along the Wabash and Ohio Rivers and at the base of some steep slopes along minor streams and drainageways.

The dominant soil orders in this LRU are Alfisols, Entisols, Inceptisols, and Mollisols. The soils in the area have a mesic soil temperature regime, a udic or aquic soil moisture regime, and dominantly mixed or smectitic mineralogy. The soils are very deep, poorly drained to excessively drained, and loamy, silty, or clayey. Nearly level Endoaqualfs (Iva series) and Argiaquolls (Ragsdale series) formed in loess on broad upland summits and flats. Nearly level to steep Hapludalfs (Alford, Iona, Muren, Stoy, and Sylvan series) and Fragiudalfs (Hosmer series) formed in loess on uplands. Hapludalfs (Alvin, Bloomfield, and Princeton series) and Argiudolls (Ade series) formed in sandy eolian material in areas of dunes on uplands and stream terraces. Steep and very steep Hapludalfs (Hickory series) formed in Illinoian till along the major streams and dissected upland drainageways. Hapludalfs (Wellston series) formed in siltstone or sandstone residuum on strongly sloping to steep side slopes underlain by bedrock.

The soils in the major stream valleys include Hapludolls (Carmi series), Argiudolls (Elston series), and Hapludalfs (Skelton series), all of which formed in outwash on nearly level to moderately sloping stream terraces and outwash plains. Endoaquolls (Montgomery series), Endoaquepts (Zipp series), Epiaqualfs (McGary series), and Hapludalfs (Shircliff and Markland series) formed in clayey lacustrine sediments on nearly level to strongly sloping lacustrine terraces or lake plains. Endoaquepts (Evansville series), Endoaquolls (Patton series), and Hapludalfs (Henshaw and Uniontown series) formed in silty sediments on terraces and lake plains.

LRU notes (excerpts from Land resource regions and major land resource areas of the United States, the Caribbean, and the Pacific Basin. USDA Handbook 296, 2006)

Classification relationships

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

U.S. Forest Service Ecoregions (Cleland et al. 2007):
Domain: Humid Temperate Domain
Division: Hot Continental Division
Province: Eastern Broadleaf Forest (Continental)
Province Code: 222
Section Code: 222G, 222D

Ecological site concept

This forest community type is found in LRU115XA on low, wet floodplains and backswamps. Soils are poorly drained to very poorly drained and formed in clayey and fine-silty alluvium. Sites have a seasonally high-water table and occasional to frequent flooding.

The reference community is a deciduous floodplain forest with a mixed species canopy. However, species composition will be a continuum from wet forest to more open marshland based on flooding frequency and severity. Some sites may flood so frequently that tree density is reduced, and the site is characterized by emergent

herbaceous vegetation adapted to flooded and saturated conditions. Frequently ponded and/or flooded sites will have less trees and an array of bulrushes, sedges, cutgrasses, cattails, and loosestrifes. The duration, frequency, and depth of flooding are the primary disturbance factors that maintain a continuum of vegetative community characteristics on Wet Clayey Floodplain ecological sites. (LANDFIRE 2009).

Tree species include pin oak (*Quercus palustris*), silver maple (*Acer saccharinum*), green ash (Fraxinus pensylvanica), American elm (*Ulmus americana*), sycamore (*Platanus occidentalis*), cottonwood (*Populus deltoides*), hackberry (Celtis spp.), and red maple (*Acer rubrum*). Pin oak (*Quercus palustris*), swamp chestnut oak (*Quercus michauxii*) and sweetgum (*Liquidambar styraciflua*) are dominant in some areas. Shrub and vine composition and density will be controlled by flooding severity and frequency and often includes possumhaw (*Ilex decidua*), hawthorn (Crataegus spp.), and swamp rose (Rosa palustris).

The forest understory will contain a variety of grasses, bulrushes, cutgrasses, sedges, and forbs influenced by flooding regime. Common species include sweet woodreed (*Cinna arundinacea*), eastern woodland sedge (*Carex blanda*), eastern star sedge (*Carex rosea*), riverbank wildrye (*Elymus riparius*), Virginia wildrye (*Elymus virginicus*), bulbous bittercress (*Cardamine bulbosa*), Pennsylvania sedge (*Cardamine pensylvanica*), false nettle (*Boehmeria cylindrica*), Virginia bugleweed (*Lycopus virginicus*), fowl mannagrass (*Glyceria striata*), clearweed (*Pilea pumila*), and star sedge (*Carex intumescens*). Ground flora on frequently, long-term flooded sites may be rather sparse with a moderate level of species diversity.

Today, the historic natural flooding regime has been modified on most streams and rivers. Dams, levees, extensive tiling and ditching throughout the watershed, and agricultural, urban and industrial water use have altered the flooding dynamics and natural hydrology of these riparian systems. Disturbed sites with altered flood regimes can exhibit a variety of trees. NRCS has recorded numerous tree species on these sites including pin oak, tulip poplar, white oak, swamp white oak, sweetgum, ash, American sycamore, eastern cottonwood, northern red oak, and red maple. Flooding and ponding frequency will determine the species composition and create a continuum of community characteristics on these sites.

Associated sites

F115XA012IL	**Clayey Floodplain** Clayey Floodplain. These floodplain sites are better drained than the Wet Clayey Floodplain and exhibit more mesic species.
F115XA013IL	**Silty Floodplain** Silty Floodplain. These sites are moderately well drained or well drained and on floodplains and have more mesic species.

Similar sites

F115XA015IL	**Loamy Floodplain** Wet Silty Floodplain. These floodplain sites share some similar tree species but are formed in silty alluvium and are somewhat poorly drained instead of poorly or very poorly drained.

Table 1. Dominant plant species

Tree	(1) *Quercus palustris*
Shrub	(1) *Ilex decidua* (2) *Crataegus*
Herbaceous	(1) *Carex*

Physiographic features

These sites are located on floodplains, backswamps, and floodplain steps. Elevation of these sites are generally between 328’ to 820’. Parent material kind and origin is clayey alluvium. Water table depth ranges from 9” to the surface. These ecological sites flood occasionally to frequently and ponding ranges from none to frequent.

Table 2. Representative physiographic features

Landforms	(1) Valley > Flood plain
Runoff class	Negligible to low
Flooding frequency	Occasional to frequent
Ponding frequency	None to frequent
Elevation	328–820 ft
Slope	0–2%
Water table depth	0–9 in
Aspect	Aspect is not a significant factor

Climatic features

About 60 percent of the precipitation falls during the freeze-free period. Most of the rainfall occurs as high-intensity, convective thunderstorms in summer. Snowfall is common in winter. The representative freeze-free period averages ranges from 192-199 days and the representative frost-free period is 171-179.

The following information is based on data taken from weather stations within MLRA 115X as calculated in EDIT.

Table 3. Representative climatic features

Frost-free period (characteristic range)	171-179 days
Freeze-free period (characteristic range)	192-199 days
Precipitation total (characteristic range)	44-47 in
Frost-free period (actual range)	166-180 days
Freeze-free period (actual range)	190-204 days
Precipitation total (actual range)	40-48 in
Frost-free period (average)	175 days
Freeze-free period (average)	196 days
Precipitation total (average)	45 in

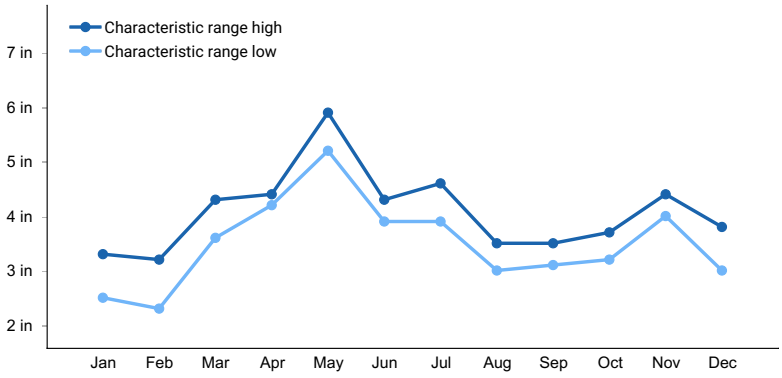


Figure 1. Monthly precipitation range

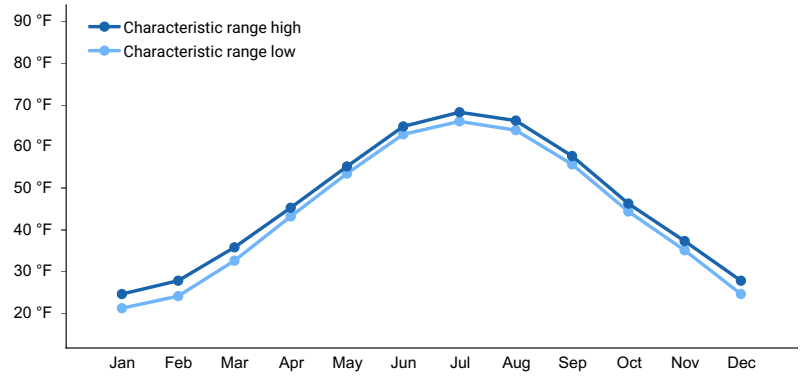


Figure 2. Monthly minimum temperature range

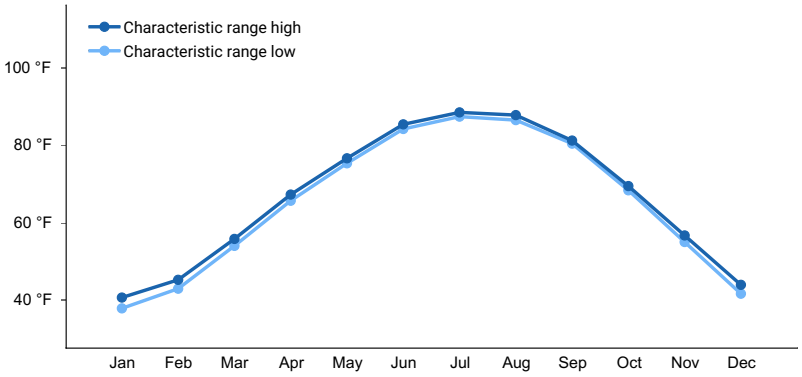


Figure 3. Monthly maximum temperature range

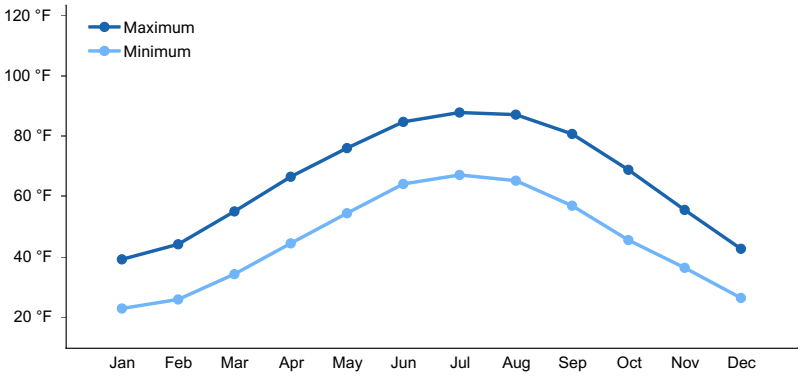


Figure 4. Monthly average minimum and maximum temperature

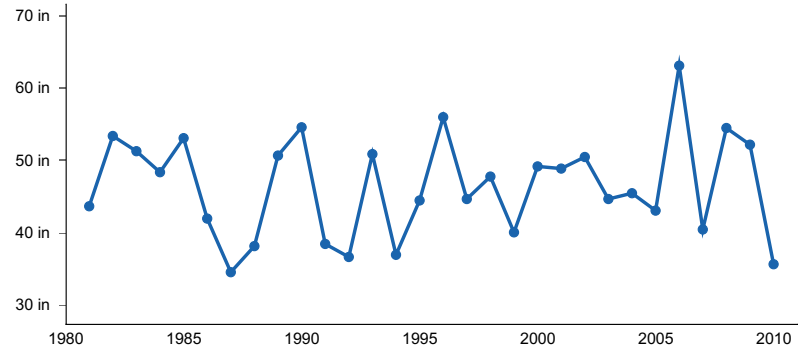


Figure 5. Annual precipitation pattern

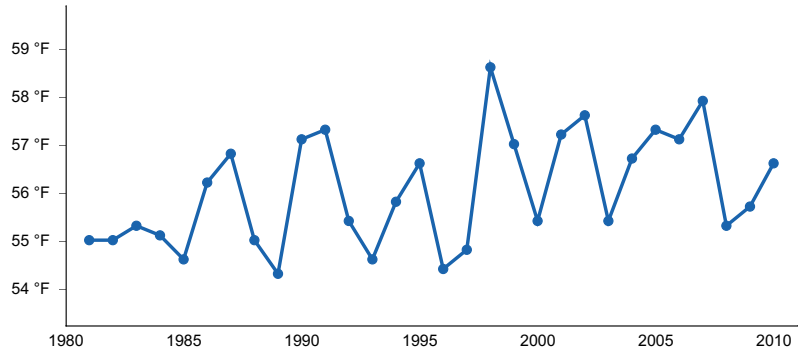


Figure 6. Annual average temperature pattern

Climate stations used

- (1) TERRE HAUTE CAA AP [USW00093823], Terre Haute, IN
- (2) VINCENNES 5 NE [USC00129113], Vincennes, IN
- (3) PRINCETON 1 W [USC00127125], Princeton, IN
- (4) EVANSVILLE REGIONAL AP [USW00093817], Evansville, IN
- (5) MT VERNON [USC00126001], Uniontown, IN

Influencing water features

Wet Clayey Floodplain sites are influenced by flooding and ponding. Flooding is occasional to frequent, and ponding ranges from none to frequent. Many sites have a seasonal highwater table present at a depth of 0”-9” below the surface.

Soil features

These soils are deep to very deep, poorly drained to very poorly drained, and formed in clayey alluvium. Soil series associated with this site include Darwin, Wabash, and Wilhite. Wet Clayey Floodplain sites are occasionally to frequently flooded and located on floodplains and backswamps.

Table 4. Representative soil features

Parent material	(1) Alluvium
Surface texture	(1) Silty clay (2) Silty clay loam
Drainage class	Very poorly drained to poorly drained
Permeability class	Very slow to slow
Depth to restrictive layer	60–80 in
Soil depth	60–80 in
Surface fragment cover <=3"	0%
Surface fragment cover >3"	0%
Available water capacity (Depth not specified)	5–7 in
Calcium carbonate equivalent (Depth not specified)	0–15%
Electrical conductivity (Depth not specified)	0 mmhos/cm
Sodium adsorption ratio (Depth not specified)	0

Soil reaction (1:1 water) (Depth not specified)	5.1–8.4
Subsurface fragment volume <=3" (Depth not specified)	0%
Subsurface fragment volume >3" (Depth not specified)	0%

Ecological dynamics

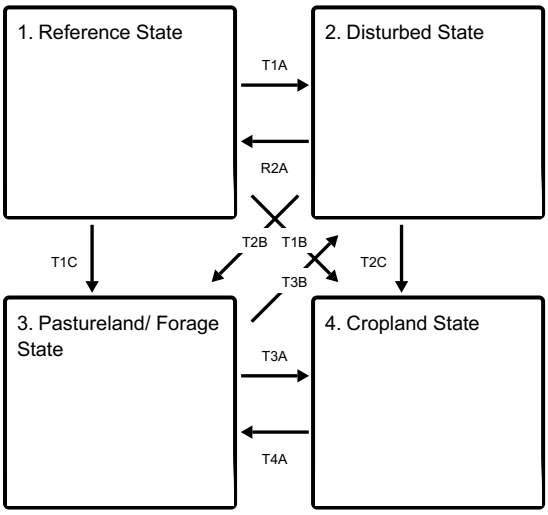
These ecological sites occur on low lying floodplains and the reference community is a broadleaf deciduous floodplain forest with a high degree of canopy diversity. Historically, floodplains were a highly dynamic system with frequent flooding that influenced the vegetative composition of these sites. Wet Clayey Floodplain forests occupy a transitional area between the river or stream and the better drained and higher elevation floodplain step and terrace forests. Common species include pin oak (*Quercus palustris*), silver maple (*Acer saccharinum*), green ash (Fraxinus pensylvanica), common hackberry (*Celtis occidentalis*), American elm (*Ulmus americana*), sycamore (*Platanus occidentalis*), cottonwood (*Populus deltoides*), and red maple (*Acer rubrum*). Swamp chestnut oak (*Quercus michauxii*) and sweetgum (*Liquidambar styraciflua*) may be dominant in some sites.

Many rivers and streams today reflect long-term, substantial alterations to the once natural dynamics that controlled these riparian systems. Dams, levees, tiling, ditching, development, agricultural water use/runoff and urban water use/runoff have often modified the once natural flooding regime of these sites. Communities that are immediately adjacent to the water bodies and still subject to frequent flooding will have a vegetative community that is early-successional. However, some sites now have a reduction in flooding frequency that allows for a more stable forest community. Trees recorded by NRCS on these sites include green ash, pin oak, swamp white oak, cottonwood, and sweetgum.

The majority of these sites have been converted to agriculture – either cropland or hayland production. Bank erosion and negative water quality impacts are common when intensive cropping is conducted without watershed buffers. Invasive non-native vegetation is another serious concern in many remaining wooded areas as loosestrife, phragmites, reed canarygrass, euonymus, and other non-native plants have been introduced and are increasing without management controls.

State and transition model

Ecosystem states



T1A - Large scale disturbance

T1C - Clearing of site; agricultural production - forage

T1B - Clearing of site; agricultural production -row crops.

R2A - Restoration inputs such as planting, brush control, prescribed fire, and timber stand improvement.

T2B - Clearing; agricultural production - forage

T2C - Clearing; agricultural production - row crops

T3B - Abandonment of agricultural practices

T3A - Site preparation and tillage, seeding, weed control, cropland management

T4A - Transition site to forage production; seeding; weed/brush control; pasture management

State 1 submodel, plant communities

1.1. Reference community

State 2 submodel, plant communities

2.1. Disturbed community

State 3 submodel, plant communities

3.1. Pastureland/Forage community

State 4 submodel, plant communities

4.1. Cropland community

State 1
Reference State

Historically these sites were influenced by flooding, ponding, wind/ice storms, and grazing by native species. The reference state for this ecological site is a deciduous floodplain forest. The vegetative communities on these sites are influenced by the frequency and depth of flooding and ponding. Natural disturbances and microtopography will create a mosaic of wet forest along with areas of more open marsh habitat. Tree species include pin oak (*Quercus palustris*), silver maple (*Acer saccharinum*), green ash (Fraxinus pensylvanica), hackberry (Celtis spp.), American elm (*Ulmus americana*), sycamore (*Platanus occidentalis*), cottonwood (*Populus deltoides*), and red maple (*Acer rubrum*). Pin oak (*Quercus palustris*), swamp chestnut oak (*Quercus michauxii*) and sweetgum (*Liquidambar styraciflua*) may be present in some areas. Understory composition and density will be controlled by flooding severity and frequency and includes possumhaw (*Ilex decidua*) and hawthorn (Crataegus spp.). The forest understory will contain a variety of grasses, bulrushes, cutgrasses, sedges, and forbs influenced by flooding regime. Species may include sweet woodreed (*Cinna arundinacea*), eastern woodland sedge (*Carex blanda*), eastern star sedge (*Carex rosea*), riverbank wildrye (*Elymus riparius*), Virginia wildrye (*Elymus virginicus*), bulbous bittercrest (*Cardamine bulbosa*), Pennsylvania sedge (*Cardamine pensylvanica*), false nettle (*Boehmeria cylindrica*), Virginia bugleweed (*Lycopus virginicus*), fowl mannagrass (*Glyceria striata*), clearweed (*Pilea pumila*), and star sedge (*Carex intumescens*). Ground flora on frequently, long-term flooded sites may be sparse with a moderate level of species diversity. Today, hydrology on many sites has been altered due to modifications upstream and throughout the watershed.

Dominant plant species

- silver maple (*Acer saccharinum*), tree
- green ash (*Fraxinus pennsylvanica*), tree
- pin oak (*Quercus palustris*), tree
- possumhaw (*Ilex decidua*), shrub
- hawthorn (*Crataegus*), shrub
- sedge (*Carex*), grass

Community 1.1
Reference community

The reference community is a deciduous floodplain forest with a mixed species canopy. However, species composition will be a continuum from wet forest to more open marshland based on flooding frequency and severity. Common species include pin oak, green ash, silver maple, sweetgum, and sycamore.

Dominant plant species

- silver maple (*Acer saccharinum*), tree
- green ash (*Fraxinus pennsylvanica*), tree
- pin oak (*Quercus palustris*), tree
- sycamore (*Platanus*), tree
- sweetgum (*Liquidambar styraciflua*), tree
- possumhaw (*Ilex decidua*), shrub
- hawthorn (*Crataegus*), shrub
- sedge (*Carex*), grass

State 2
Disturbed State

Many remaining Wet Clayey Floodplain sites have been altered due to disturbances and hydrological modifications – either within the watershed or upstream. Dams, ditching, tiling, levees, and urban, industrial and agricultural impacts are common and have modified the historic natural riparian processes. Trees on disturbed sites will depending on the type, length and severity of disturbances. Many areas are now protected from frequent and severe flooding so have transitioned to a more mesic upland tree community. Disturbance may introduce non-native plant species to these sites and without management control, these invasive plants will fundamentally alter the plant community. Many of these sites have been transitioned to Pastureland (State 3) or cropland (State 4).

Dominant plant species

- maple (*Acer*), tree
- ash (*Fraxinus*), tree
- common hackberry (*Celtis occidentalis*), tree
- hybrid hickory (*Carya*), tree

Community 2.1
Disturbed community

This is a disturbed, successional community that includes a variety of fast-growing trees such as maples and ashes. Other species may include hackberry, sweetgum, and poplar. Shrub and understory species will depend on the type, severity and length of disturbances, available seed sources, and management inputs, if present.

Dominant plant species

- maple (*Acer*), tree
- ash (*Fraxinus*), tree
- hackberry (*Celtis*), tree

State 3
Pastureland/ Forage State

A portion of these sites have been converted to pastureland or forage production. Species selection will depend upon the objectives and goals of the landowner; however, commonly planted grasses include tall fescue (*Schedonorus arundinaceus*), brome (Bromus spp.), white clover (*Trifolium repens*) and red clover (*Trifolium pratense*). Species health and productivity are determined by the management and long-term overgrazing on some sites has caused soil erosion and compaction.

Dominant plant species

- tall fescue (*Schedonorus arundinaceus*), grass
- brome (*Bromus*), grass
- Kentucky bluegrass (*Poa pratensis*), grass
- white clover (*Trifolium repens*), other herbaceous
- red clover (*Trifolium pratense*), other herbaceous

Community 3.1
Pastureland/Forage community

These sites are managed for forage production and often include tall fescue (*Schedonorus arundinaceus*), brome (Bromus spp.), white clover (*Trifolium repens*) and red clover (*Trifolium pratense*). Selection of species will depend on the landowner's objectives.

Dominant plant species

- tall fescue (*Schedonorus arundinaceus*), grass
- brome (*Bromus*), grass
- Kentucky bluegrass (*Poa pratensis*), grass
- red clover (*Trifolium pratense*), other herbaceous
- white clover (*Trifolium repens*), other herbaceous

State 4
Cropland State

Hydrological modifications such as ditching and tiling are often used on these sites to increase crop production. Common crops include corn (*Zea mays*), soybeans (*Glycine max*), and occasionally winter wheat (*Triticum aestivum*). Some landowners choose to convert sites to cool season grasses for a period before resuming cropland production. A return to the historical Reference State from State 4 is unlikely, if not impossible.

Dominant plant species

- corn (*Zea mays*), other herbaceous
- soybean (*Glycine*), other herbaceous

Community 4.1
Cropland community

This community is characterized by the management and production of row crop agriculture. Common species include corn, soybean and wheat. Many other crops are suitable for these sites, and species selection will depend upon the landowners goals and objectives.

Dominant plant species

- soybean (*Glycine max*), other herbaceous
- corn (*Zea mays*), other herbaceous

Transition T1A
State 1 to 2

Severe disturbances, such as clearing or selective harvesting of trees, will transition this site to State 2.

Transition T1C
State 1 to 3

Site is transitioned to an agricultural site focused on forage production. Management inputs would include clearing, site preparation, seeding and weed/brush control.

Transition T1B
State 1 to 4

Site is transitioned to an agricultural site focused on row crop production. Management inputs would include clearing, site preparation, seeding and weed control. Hydrological modifications are often installed to aid in drainage.

Restoration pathway R2A
State 2 to 1

Restoration would require long-term management inputs including planting of desired species, weed control, brush control, timber stand improvement, and prescribed fire.

Transition T2B
State 2 to 3

Site is cleared and forage/pasture production is initiated. Management inputs would include tree/shrub removal, site preparation, seeding, and weed/brush control.

Transition T2C
State 2 to 4

Site is cleared and row crop production is initiated. Management inputs would include tree/shrub removal, site preparation, tillage, seeding, and weed control.

Transition T3B
State 3 to 2

Site is abandoned and slowly would transition to a wooded state dominated by deciduous trees. Species on site would depend on the severity and length of disturbance and available seed sources.

Transition T3A
State 3 to 4

Management inputs that transition a site from pasture or forage production to a site that is utilized for row crop production.

Transition T4A
State 4 to 3

Management inputs to transition a site from cropland production to a state of pasture/forage production.

Additional community tables

Inventory data references

A Provisional Ecological Site Description (PESD) 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. A PESD with a provisional status represents the lowest tier of documentation that is

releasable to the public. No field level data have been collected as part of this PESD. It is expected that a PESD will continue to be refined through field verification and field sampling.

Reference and alternative state concepts, including the state-and-transition model and vegetative communities are not yet well-documented and will require field sampling for verification.

Other references

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Approval

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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	01/10/2025
Approved by	Suzanne Mayne-Kinney
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):**

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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:**

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7. **Amount of litter movement (describe size and distance expected to travel):**

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8. **Soil surface (top few mm) resistance to erosion (stability values are averages - most sites will show a range of values):**

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9. **Soil surface structure and SOM content (include type of structure and A-horizon color and thickness):**

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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:

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13. **Amount of plant mortality and decadence (include which functional groups are expected to show mortality or decadence):**

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14. **Average percent litter cover (%) and depth (in):**

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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:**

17. **Perennial plant reproductive capability:**