USDA Natural Resources Conservation Service

Ecological site F113XY922IL
Loamy Floodplain Forest

Last updated: 5/17/2024
Accessed: 10/20/2024

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): 113X–Central Claypan Areas

The eastern Illinois portion of the Central Claypan Areas MLRA is in the Till Plains Section of the Central Lowland Province of the Interior Plains (USDA-NRCS, 2006) and includes the Southern Till Plain Natural Division of the natural divisions of Illinois (Schwegman, 1973; 1997; IDNR, 2018) in south-central Illinois. South-central Illinois is a dissected Illinoisan till plain south of the terminal Wisconsin moraine. This region consists of nearly level to gently sloping, old till plains. Stream valleys are shallow and generally are narrow. Elevation is about 660 feet (200 meters), increasing gradually from south to north. Local relief is generally low on the broad, flat till plains and flood plains and high on the dissected hills bordering rivers or drainage systems. The Kaskaskia, Little Muddy, Little Wabash, Embarras, and Skillet Fork rivers are part of this area. This region is covered with loess, which overlies old glacial drift (Illinoisan till) that has a high content of clay. Fragipans are also present. Pennsylvanian limestone and shale bedrock underlay the glacial till. The dominant soil orders in this region are Alfisol and Mollisol. The soils in the area predominantly have a mesic soil temperature regime, an aquic or udic soil moisture regime, and mixed or smectitic mineralogy. They generally are very deep, well drained to poorly drained, and loamy or clayey. (USDA-NRCS, 2006).

Classification relationships

Major Land Resource Area (MLRA) (USDA-NRCS, 2006):
113 – Central Claypan Areas, Eastern Part
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: Central Till Plains, Oak-Hickory Section
Section Code: 222G

Ecological site concept

The historic pre-European settlement vegetation on this site was dominated by a continuous canopy of deciduous trees with an understory of shade-tolerant shrubs and ground flora (LANDFIRE 2009). Loamy Floodplain Forests occur in floodplain steps on smaller floodplains. Soils are well drained and very deep formed from coarse, silty alluvium that are occasional to frequently flooded (Nelson 2010; White 1978).

This sycamore – black walnut mesic floodplain forest occurs on well drained floodplain steps and small streams. Stands are dominated by American sycamore (Platanus occidentalis L.)*, with a mixture of other species, including boxelder (Acer negundo L.), silver maple (Acer saccharinum L.), white ash (Fraxinus americana L.), green ash (Fraxinus pennsylvanica Marshall), black walnut (Juglans nigra L.), American elm (Ulmus americana L.), bitternut hickory (Carya cordiformis (Wangenh.), white oak (Quercus alba L.), basswood (Tilia americana L.) and slippery elm

(Ulmus rubra Muhl.). Shrubs include pawpaw (Asimina triloba (L.) Dunal) and northern spicebush (Lindera benzoin (L.) Blume). Vines may be abundant, including Virginia creeper (Parthenocissus quinquefolia (L.) Planch.) and eastern poison ivy (Toxicodendron radicans (L.) Kuntze). Herbaceous species include Jack in the pulpit (Arisaema triphyllum (L.) Schott), Canadian wildginger (Asarum canadense L.), smallspike false nettle (Boehmeria cylindrica (L.) Sw.), Virginia wildrye (Elymus virginicus L.), Canadian clearweed (Pilea pumila (L.) A. Gray), and jumpseed (Polygonum virginianum L.). Historically, seasonal, short duration flooding was the primary disturbance factor, while windthrow events and beaver alterations were secondary factors (LANDFIRE 2009; Nelson 2010; NatureServe 2018; Voigt and Mohlenbrock 1964; White 1978).

Associated sites

F113XY911IL	**Loamy Till Backslope Forest** This ecological site is located on steep backslopes above Loamy Floodplain Forests.
F113XY919IL	**Wet Silty Floodplain Forest** This ecological site is located in lower floodplains with Loamy Floodplain Forests.
F113XY920IL	**Silty Floodplain Forest** This ecological site is located in floodplains generally adjacent to but lower than Loamy Floodplain Forests.

Similar sites

F113XY920IL	**Silty Floodplain Forest** This ecological site is located in lower floodplain areas from Loamy Floodplain Forests.

Table 1. Dominant plant species

Tree	(1) *Platanus occidentalis* (2) *Juglans nigra*
Shrub	(1) *Asimina triloba*
Herbaceous	(1) *Elymus virginicus* (2) *Arisaema triphyllum*

Physiographic features

This site is on well drained coarse-loamy water sediments on narrow floodplains, natural levees, and floodplain steps with slopes of less than 2 percent with occasional to frequent flooding. The site generates some runoff to adjacent lower floodplain sites, and receives some runoff from higher stream terraces and uplands.

Table 2. Representative physiographic features

Landforms	(1) Alluvial plain > Flood plain (2) Alluvial plain > Flood-plain step (3) Alluvial plain > Natural levee (4) Alluvial plain > Terrace--stream or lake
Runoff class	Negligible to low
Flooding duration	Brief (2 to 7 days)
Flooding frequency	Occasional to frequent
Elevation	115–255 m
Slope	0–2%
Water table depth	36–61 cm
Aspect	Aspect is not a significant factor

Climatic features

The soil temperature regime of MLRA 113 is classified as mesic, where the mean annual soil temperature is

between 47 and 59°F. Temperature and precipitation occur along a north-south gradient, where temperature and precipitation increase the further south you travel (USDA-NRCS 2006). The majority of the precipitation occurs as rainfall in the form of convective thunderstorms during the growing season.

Table 3. Representative climatic features

Frost-free period (characteristic range)	144-151 days
Freeze-free period (characteristic range)	181-187 days
Precipitation total (characteristic range)	1,067-1,118 mm
Frost-free period (actual range)	141-153 days
Freeze-free period (actual range)	179-189 days
Precipitation total (actual range)	1,041-1,118 mm
Frost-free period (average)	147 days
Freeze-free period (average)	184 days
Precipitation total (average)	1,092 mm

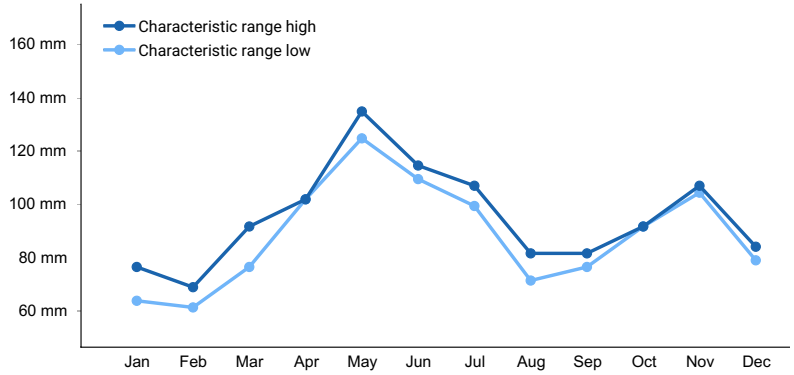


Figure 1. Monthly precipitation range

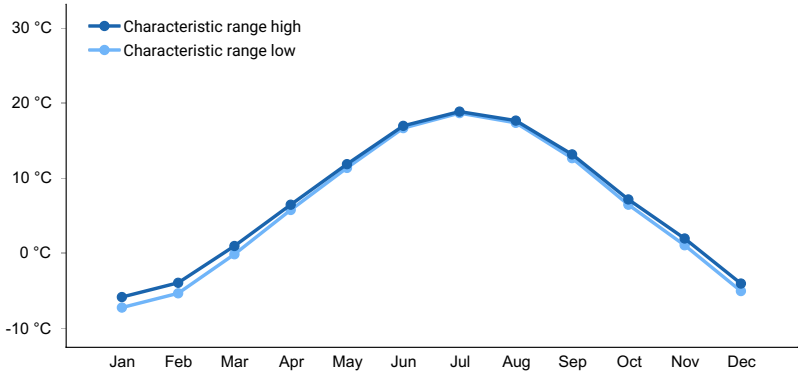


Figure 2. Monthly minimum temperature range

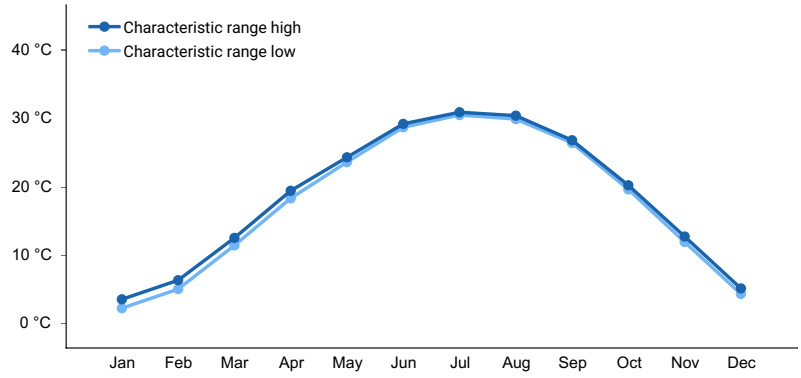


Figure 3. Monthly maximum temperature range

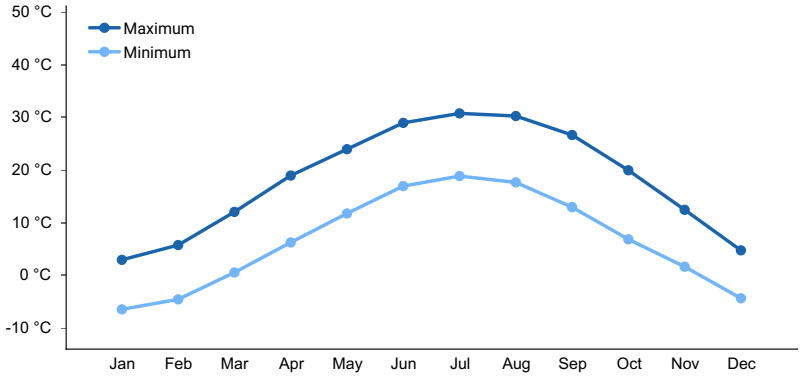


Figure 4. Monthly average minimum and maximum temperature

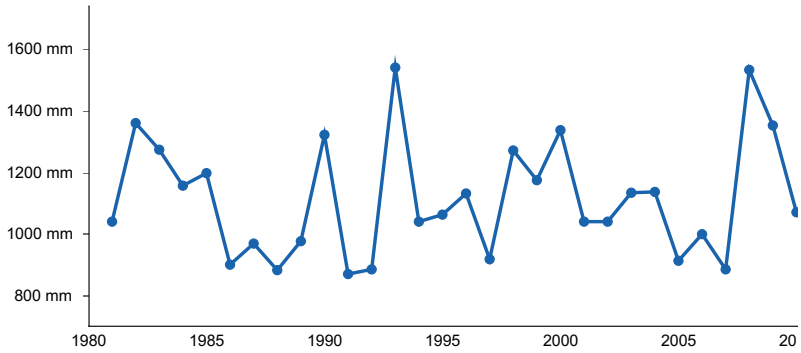


Figure 5. Annual precipitation pattern

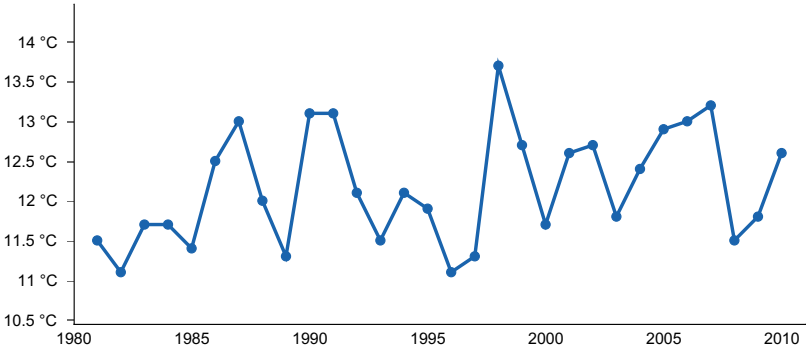


Figure 6. Annual average temperature pattern

Climate stations used

- (1) PANA 3E [USC00116579], Pana, IL
- (2) EFFINGHAM 3SW [USW00093816], Effingham, IL
- (3) FLORA 5 NW [USC00113109], Flora, IL

Influencing water features

This ecological site is typically on high floodplains and natural levees. Stream levels typically respond quickly to storm events, especially in watersheds where surface runoff is dominant. Short- to medium- duration flooding is not uncommon in many areas, particularly during spring and early summer storm events. Stream modifications have altered the hydrology and flooding dynamics in places. Streambeds that are incised into the surrounding floodplain may be a sign of an alternative state. In most areas the water table has a minimal effect on the vegetative community.

Soil features

These soils have no rooting restriction. Organic matter content is variable. They are not affected by seasonal wetness. These soils have moderately permeability and are very deep. They were formed under a mixture of herbaceous and woodland vegetation with periodic depositional flood events. Parent material is loamy alluvium (coarse-loamy particle size family class). They have loam and silt loam surface horizons and loamy subsoils lacking argillic horizons that may be skeletal with depth. Soils of this ecological site are in the Mollisol, Entisol and Inceptisol orders. Soil series associated with this site include Medway and Wirt. (NCSS, 2018; SSS NRCS OSD, 2018)

Table 4. Representative soil features

Parent material	(1) Alluvium
Surface texture	(1) Silt loam (2) Loam
Drainage class	Moderately well drained to well drained
Permeability class	Moderately slow
Soil depth	183 cm
Surface fragment cover <=3"	0%
Surface fragment cover >3"	0%
Available water capacity (Depth not specified)	15.24–20.32 cm
Calcium carbonate equivalent (Depth not specified)	0%
Sodium adsorption ratio (Depth not specified)	0
Soil reaction (1:1 water) (Depth not specified)	5.6–7.3
Subsurface fragment volume <=3" (Depth not specified)	4–14%
Subsurface fragment volume >3" (Depth not specified)	0–4%

Ecological dynamics

The MLRA lies within the transition zone between the eastern deciduous forests and the central tallgrass prairies. The heterogeneous topography of the area results in variable microclimates and fuel matrices that in turn are able to support prairies, savannas, woodlands, and forests. Loamy Floodplain Forests form an aspect of this vegetative continuum. This ecological site occurs on floodplain steps. Species characteristic of this ecological site consist of broadleaf deciduous floodplain forest species which exhibits high canopy diversity. (Anderson, 1975; White, 1978).

Historically, Loamy Floodplain Forests were on relatively stable floodplain positions and natural levees that occasionally flooded. It is likely that the hydrology of these streams has altered since pre-settlement because of changes in land use. Current flooding is likely more frequent but brief. Historically these forests were structurally and compositionally diverse, with occasional tree fall gaps caused by flooding and natural mortality providing opportunities for regeneration of overstory species. The understory was also complex, with multiple layers of shade-

tolerant species such as pawpaw and spicebush. Numerous species of vines also climb into canopy gaps and a diverse array of ground flora species carpet the forest floor. (NatureServe 2018)

Today many of these ecological sites have been cleared and converted to intensive agriculture. The remaining forests often occur as a narrow band in the floodplain. These remaining bands of forest play an important role as a source of food and shelter for migrating birds. In addition, they are very important for streambank stabilization, capturing sediment and mitigating scour during flood events.

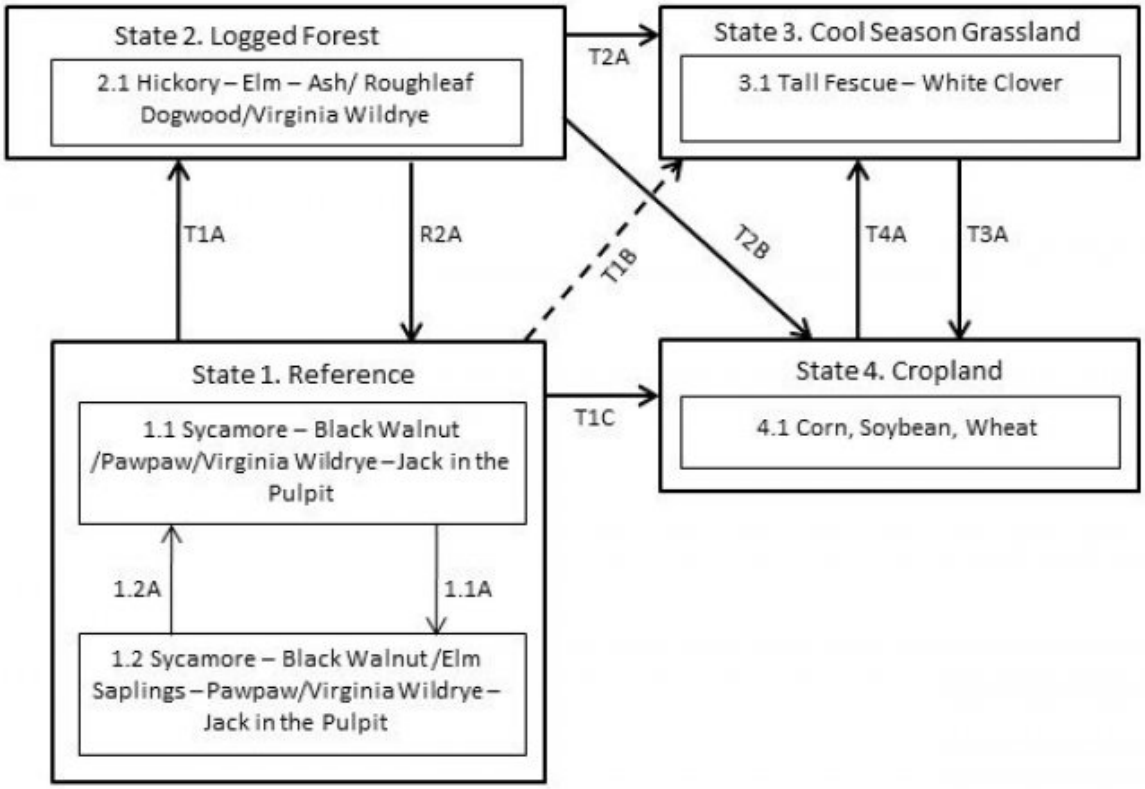
These remaining remnants that still exist also play an important role as a source of food and shelter for migrating birds. In addition, large floodplain trees that extend above the canopy are important nesting sites for bald eagles (Haliaeetus leucocephalus) and herons (Ardea spp.). (Guyon et. al. 2016). Carefully planned timber harvest can be tolerated by this system, but high-grading of the timber will also degrade the system.

Carefully planned timber harvests can be tolerated in this system, but high grading of the timber will eventually degrade the ecological site. Re-establishment of these riparian forests is important for stream quality and health, as well as for migratory birds. Planting of appropriate species has proven to be quite successful.

A provisional state and transition diagram is depicted in Figure 2. 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 may change as knowledge increases.

State and transition model

Loamy Floodplain Forest, F113XY922IL



Code	Event/Activity/Process
T1A	Lack of natural disturbance events > 20 years; repeated timber harvests
T3A	Tillage; conservation cropping system; water management
T1B,T2A	Woody removal; vegetative seeding; grassland management
T1C, T2B	Woody removal; tillage; conservation cropping system; water management
T4A	Vegetative seeding ; grassland management
1.1A	Lack of natural disturbance events 10+ years
1.2A	Natural disturbance events 1-3 years
R2A	Forest stand improvement

State 1
Reference State

The historical reference state for this ecological site was old growth riverine forest. The forest was dominated by sycamore, elms, ashes and mesic species such as black walnut and bitternut hickory. Maximum tree age was likely 150 to 300 years. Periodic disturbances from occasional flooding, wind or ice affected the structure and ground flora species. Long disturbance-free periods allowed an increase in canopy cover, the density of trees and the abundance of shade tolerant species. Two community phases are recognized in the reference state, with shifts between phases based on disturbance frequency. Reference states are very rare today. Altered drainage has resulted in increased canopy density, which has affected the abundance and diversity of ground flora. Most reference states are currently altered because of timber harvesting, clearing and conversion to grassland or cropland.

Dominant plant species

- American sycamore (*Platanus occidentalis*), tree
- black walnut (*Juglans nigra*), tree
- elm (*Ulmus*), tree
- ash (*Fraxinus*), tree
- bitternut hickory (*Carya cordiformis*), tree
- pawpaw (*Asimina triloba*), shrub
- Virginia wildrye (*Elymus virginicus*), grass
- Jack in the pulpit (*Arisaema triphyllum*), other herbaceous

Community 1.1
Sycamore - Black Walnut / Pawpaw/Virginia Wildrye - Jack in the Pulpit

This community is characterized by American sycamore, black walnut, elms, ashes, bitternut hickory, and a diverse understory including Jack in the pulpit and Virginia wildrye.

Dominant plant species

- American sycamore (*Platanus occidentalis*), tree
- black walnut (*Juglans nigra*), tree
- pawpaw (*Asimina triloba*), shrub
- Virginia wildrye (*Elymus virginicus*), grass
- Jack in the pulpit (*Arisaema triphyllum*), other herbaceous

Community 1.2
Sycamore - Black Walnut /Elm spalings - Pawpaw/Virginia Wildrye - Jack in the Pulpit

This community shows an increase in tree saplings.

Dominant plant species

- American sycamore (*Platanus occidentalis*), tree
- black walnut (*Juglans nigra*), tree
- pawpaw (*Asimina triloba*), shrub
- Virginia wildrye (*Elymus virginicus*), grass
- Jack in the pulpit (*Arisaema triphyllum*), other herbaceous

Pathway 1.1.A
Community 1.1 to 1.2

Lack of natural disturbance events for over 10 years.

Pathway 1.2.A
Community 1.2 to 1.1

Natural disturbance events 1-3 years.

State 2
Logged Forest

Composition is altered from the reference state depending on tree selection during harvest. This state will slowly increase more shade tolerant species with selective harvesting techniques. Without periodic canopy disturbance, stem densities and more shade tolerant species will increase in abundance. Some periodic uncontrolled grazing may be occurring. High grade logging of more valuable species, such as black walnut and white oak has been common.

Dominant plant species

- hybrid hickory (*Carya*), tree
- elm (*Ulmus*), tree
- ash (*Fraxinus*), tree
- roughleaf dogwood (*Cornus drummondii*), shrub
- Virginia wildrye (*Elymus virginicus*), grass

Community 2.1
Hickory - Elm - Ash/ Roughleaf Dogwood/Virginia Wildrye

Species composition is altered from the reference state due to disturbances.

Dominant plant species

- elm (*Ulmus*), tree
- hybrid hickory (*Carya*), tree
- ash (*Fraxinus*), tree
- roughleaf dogwood (*Cornus drummondii*), shrub
- Virginia wildrye (*Elymus virginicus*), grass

State 3
Cool Season Grassland

Conversion of other states to non-native cool season species such as tall fescue (*Schedonorus arundinaceus* (Schreb.) Dumort., nom. cons.), red top (Agrostis alba auct. non L.) and white clover (*Trifolium repens* L.) has been common. Occasionally, these pastures will have scattered pecans. Long term uncontrolled grazing can cause significant soil erosion and compaction. A return to the reference state may be impossible, requiring a very long term series of management options and transitions.

Dominant plant species

- tall fescue (*Schedonorus arundinaceus*), grass
- bentgrass (*Agrostis*), grass
- white clover (*Trifolium repens*), other herbaceous

Community 3.1
Tall Fescue - White Clover

A community dominated by seeded cool season grasses and legumes.

Dominant plant species

- tall fescue (*Schedonorus arundinaceus*), grass
- white clover (*Trifolium repens*), other herbaceous

State 4
Cropland

This is a state that exists currently with intensive cropping of corn (*Zea mays* L), soybeans (*Glycine max* (L.) Merr.),

and wheat (*Triticum aestivum* L.). Some conversion to cool season hay land occurs, but when commodity prices are high, these states transition back to cropland.

Dominant plant species

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

Community 4.1
Corn, Soybeans, Wheat

Agricultural state with crops such as corn, beans, and winter wheat.

Dominant plant species

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

Transition T1A
State 1 to 2

Lack of natural disturbance events for 20 years or more. Repeated timber harvesting may have occurred.

Transition T1B
State 1 to 3

Woody removal; vegetative seeding; grassland management

Transition T1C
State 1 to 4

Woody removal and tillage of the site. Conservation cropping system and water management often occurs.

Restoration pathway R2A
State 2 to 1

Forest stand improvement

Transition T2A
State 2 to 3

Woody removal; vegetative seeding; grassland management

Transition T2B
State 2 to 4

Woody removal; tillage; conservation cropping system; water management

Transition T3A
State 3 to 4

Tillage; conservation cropping system; water management

Transition T4A
State 4 to 3

Vegetative seeding; grassland management

Additional community tables

Inventory data references

No field plots were available for this site. A review of the scientific literature and professional experience were used to approximate the plant communities and ecological dynamics for this provisional ecological site. Information for the state-and-transition model was obtained from the same sources. All states and community phases are considered provisional based on the sources identified in ecological site description.

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Other references

Relationship to other established ecological classifications (done)
Biophysical Setting (LANDFIRE, 2009); the reference community of this ecological site is most similar to: South-Central Interior Large Floodplain (CES202.705)

National Vegetation Classification System (NatureServe, 2018): the reference community of this ecological site is most similar to: Platanus occidentalis - Acer saccharinum - Juglans nigra - Ulmus rubra Floodplain Forest (CEGL007334)

Illinois Natural Areas Survey (INAS) (White, 1978); the reference community of this ecological site is most similar to: INAS Community Class – Floodplain Forest; Natural community – Mesic Floodplain Forest

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Approval

Suzanne Mayne-Kinney, 5/17/2024

Acknowledgments

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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	10/20/2024
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):**

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):**

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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):**

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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:**
