Ecological site F114XB203IN
Wet Floodplain Forest

Last updated: 11/16/2023
Accessed: 05/06/2024

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): 114X–Southern Illinois and Indiana Thin Loess and Till Plain

This MLRA is a loess-covered till plain with broad, nearly level summits and steeper slopes in areas. dissected by tributaries of the Ohio and Mississippi Rivers. It is used to produce cash crops, feed grain, and livestock. This MLRA is in Indiana (47 percent), Illinois (38 percent), and Ohio (15 percent) in four separate areas. It makes up about 10,388 square miles (26,904 square kilometers).

This area is in the Till Plains section of the Central Lowland province of the Interior Plains. 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 or gently sloping. Steep slopes are along rivers and streams. Elevation ranges from 310 feet (90 meters) on the southernmost flood plains to 1,340 feet (410 meters) on the highest ridges. Local relief is mainly 10 to 50 feet (3 to 15 meters) but can be 50 to 100 feet (15 to 30 meters) along drainageways and streams.
The Little Miami River flows through the part of this MLRA in Ohio. The Ohio River flows along the southernmost boundary in some parts of this area in Ohio. The Kaskaskia River flows through the part of this area in Illinois. Tributaries to the Mississippi and Ohio Rivers drain this MLRA.

This area is covered dominantly by loess and Illinoian-age till or outwash. Most of the loess is Late Wisconsin-age Peoria Loess. In some places the Peoria Loess in underlain by Early Wisconsin-age Roxana Silt or by sandier or grittier loess. The loess ranges from 3 to 7 feet (1 or 2 meters) in thickness on stable summits and does not occur on some of the steeper slopes. The underlying Illinoian-age till and outwash commonly contain a paleosol. Meltwater outwash and lacustrine and alluvial deposits are on some of the stream terraces along the major tributaries. The till and outwash are underlain by several bedrock systems. Mississippian and Pennsylvanian bedrock occurs mostly in the western part of the MLRA. Ordovician, Silurian, and Devonian bedrock occurs mostly in the central part. Bedrock outcrops are common on the bluffs along the large rivers and their major tributaries. They also are evident at the base of steep slopes along minor streams and drainageways.

The average annual precipitation ranges from 39 to 47 inches (990 to 1,190 millimeters) with a mean of 42 inches (1,060 millimeters). The annual temperature ranges from 53 to 56 degrees F (11.8 to 13.6 degrees C) with a mean of 55 degrees F (13 degrees C). The freeze-free period ranges from 185 to 215 days with a mean of 200 days.

The dominant soil orders are Alfisols and Entisols. 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 deep or very deep, poorly drained to well drained, and loamy, silty, or clayey. Although limited in extent, some soils have a natric horizon in the part of the MLRA in Illinois. The main soils and their series: Albaqualfs that formed in loess or loess over pedisediment on till plains (Marine series); Endoaqualfs that formed in loess or loess over pedisedimenton till plains (Oconee series); Fluvaquents that formed in alluvium on flood plains (Wakeland series); Fragiudalfs that formed in loess over pedisediment over till (Cincinnati series) and loess over till (Rossmoyne series) on till plains; Glossaqualfs that formed in loess over till on till plains (Avonburg, Clermont, and Cobbsfork series) Hapludalfs that formed in till (Hickory series) and loess over pedisediment (Homen series) on till plains.

The soils on uplands support natural hardwoods. Oak, hickory, beech, and sugar maple are the dominant species. Native grasses grow in some scattered areas between the trees. The soils in low-lying areas support mixed forest vegetation. Pin oak, shingle oak, sweetgum, and black oak are the dominant species on the wetter sites. White oak, black oak, northern red oak, hickory, yellow-poplar, ash, sugar maple, and black walnut grow on the better drained sites. Honey locust is dominant on soils that formed in shaly limestone residuum. Silver maple, eastern cottonwood, American sycamore, pin oak, elm, and sweetgum grow along rivers and streams. Black walnut is abundant on very deep, well drained soils on some small flood plains. Sedge and grass meadows and scattered trees are on some low-lying sites.

Most of this MLRA is in farms and used to produce corn, soybeans, and livestock. Some small grains, including winter wheat, oats, and grain sorghum, also are grown. A small acreage is used for specialty crops, such as popcorn and apple orchards. The grassland supports introduced and native grasses. The forested areas are mainly on steep valley sides and in low-lying parts of flood plains. Surface coal mines make up a small acreage. (USDA, Natural Resources Conservation Service. 2022)

LRU notes

LRU 114XB is in two separate areas in Illinois (66 percent) and Indiana (34 percent). It makes up about 7,005 square miles (18,150 square kilometers). It includes the towns of Brazil, Bloomfield, Cloverdale, and Spencer, Indiana, and Carlyle, Nashville, Hillsboro, Greenville, Vandalia, and Pinckneyville, Illinois. Interstates 55, 64, and 70 cross the part of the MLRA in Illinois. They converge in St. Louis, which is just west of this MLRA. The east edge of the Scott Air Force Base is on the western edge of the area in Illinois.

This area is in the Till Plains Section of the Central Lowland Province of the Interior Plains. Both large and small tributaries of the West Fork of the White River, the Eel River, the Kaskaskia River, and the Little Muddy River dissect the nearly level to very steep uplands. 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. Elevation ranges from 350 feet (105 meters) on the southernmost flood plains along the Ohio and Wabash Rivers to 1,190 feet (365 meters) on the highest ridges. Local relief is mainly 10 to 50 feet (3 to 15 meters), but it can be 50 to 100 feet (15 to 30 meters) along drainageways and streams. It generally is low on broad, flat till plains and flood plains and high on the dissected hills bordering rivers or drainage systems.

Classification relationships

Major Land Resource Area (MLRA) (USDA-NRCS, 2022):
114X–Southern Illinois and Indiana Thin Loess and Till Plain

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

NatureServe Ecological System(s) and/or Associations:
The following NatureServe Explorer Ecological System Record(s) have a high level of probability to match the ecological site reference community found on these soils.
Scientific Name: South-Central Interior Large Floodplain-CES202.705
NorthCentral Interior Floodplain CES202.694

Ecological site concept

Wet Floodplain Forest sites occur in floodplains along riparian channels. Sites are somewhat poorly drained to poorly drained and formed from alluvium that may be seasonally flooded. Numerous tree species can be found on these sites including American sycamore (Platanus occidentalis), green ash (Fraxinus pennsylvanica), common hackberry (Celtis occidentalis), silver maple (Acer saccharinum), American elm (Ulmus americana), and black willow (Salix nigra). Swamp white oak (Quercus bicolor) and pecan (Carya illinoinensis) may be present on some

sites.

The understory plant composition may be sparse or barren due to flooding or ponding on frequently flooded sites or quite dense and lush on sites with rare flooding/ponding regimes. 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). Today, most of these sites are utilized for agriculture. Hydrological modification such as tiling and ditching are common.

Associated sites

F114XB204IN	**Floodplain Forest** Both Floodplain Forest and Wet Floodplain Forest ecological sites occur on floodplains with little to no slope. Floodplain Forest sites have less clay percentages and result in better drainage. The Wet Floodplain Forest has a water table year round and the Floodplain Forest has a water table during the rainy season when runoff occurs.

Similar sites

F114XB103IN	**Wet Lacustrine Forest** Wet Lacustrine Forest and Wet Floodplain Forest sites both occur on floodplains and terraces with little to no slope. Both sites have poorly drained soils and are dominated by diverse floodplain vegetation communities. The Wet Lacustrine Forest parent material is Lacustrine deposits from lakes where as Wet Floodplain Forest is alluvium and carried by streams and creeks.

Table 1. Dominant plant species

Tree	(1) *Acer saccharinum* (2) *Fraxinus pennsylvanica*
Shrub	(1) *Cornus drummondii* (2) *Salix*
Herbaceous	(1) *Laportea canadensis* (2) *Carex*

Physiographic features

Sites are located on floodplains, backswamps and low stream terraces.

Table 2. Representative physiographic features

Landforms	(1) Flood plain (2) Hill (3) Stream terrace (4) Backswamp (5) Flood-plain step
Runoff class	Negligible to low
Flooding duration	Extremely brief (0.1 to 4 hours) to long (7 to 30 days)
Flooding frequency	None to frequent
Ponding duration	Very brief (4 to 48 hours) to long (7 to 30 days)
Ponding frequency	None to frequent
Elevation	330–1,020 ft
Slope	0–4%
Ponding depth	0–24 in
Water table depth	0–36 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 during summer. Snowfall is common in winter. The freeze-free period averages about 180 days.

Table 3. Representative climatic features

Frost-free period (characteristic range)	143-164 days
Freeze-free period (characteristic range)	175-188 days
Precipitation total (characteristic range)	44-47 in
Frost-free period (actual range)	134-168 days
Freeze-free period (actual range)	174-188 days
Precipitation total (actual range)	41-48 in
Frost-free period (average)	153 days
Freeze-free period (average)	181 days
Precipitation total (average)	45 in

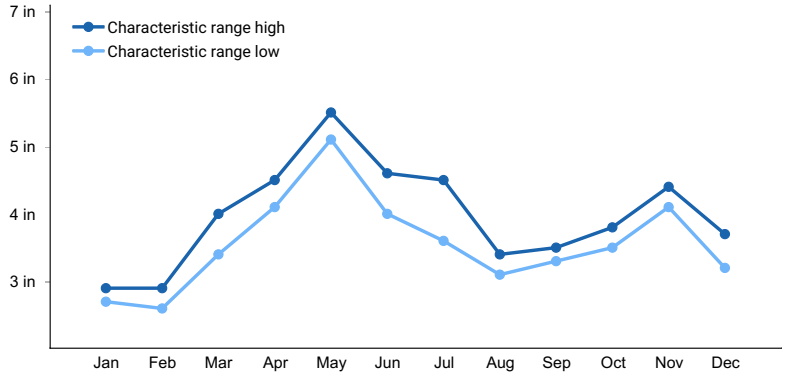


Figure 1. Monthly precipitation range

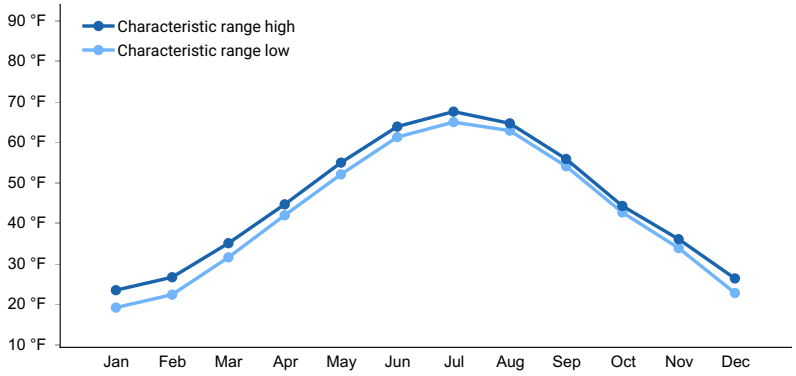


Figure 2. Monthly minimum temperature range

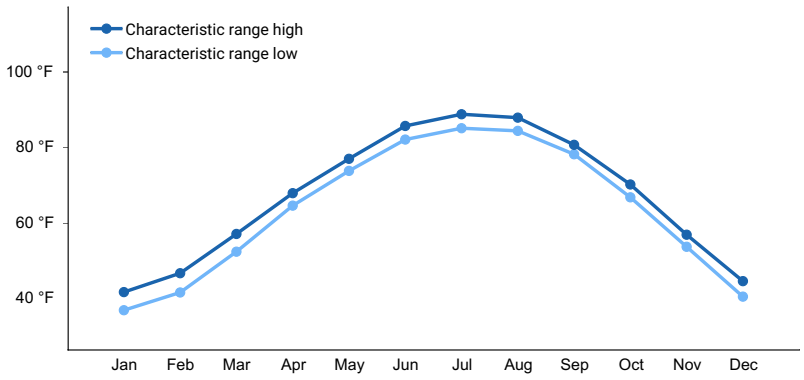


Figure 3. Monthly maximum temperature range

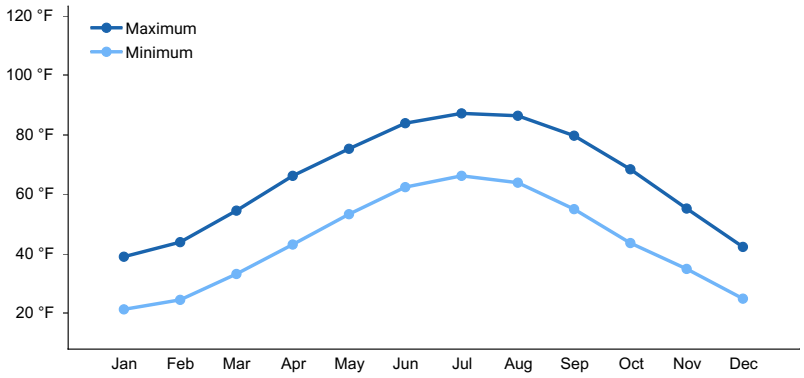


Figure 4. Monthly average minimum and maximum temperature

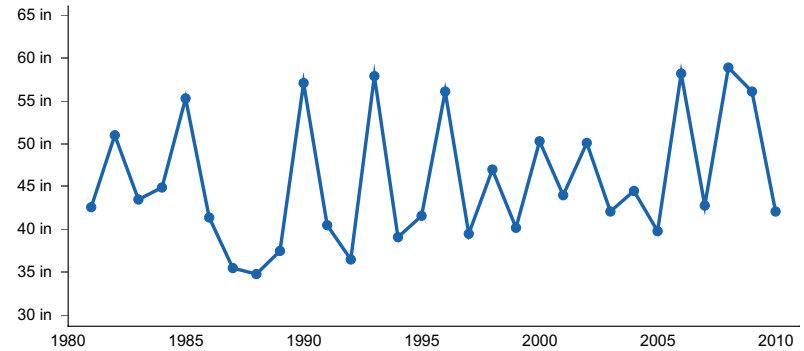


Figure 5. Annual precipitation pattern

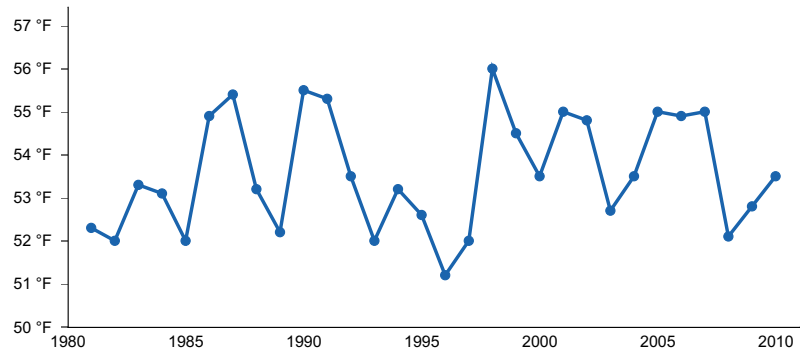


Figure 6. Annual average temperature pattern

Climate stations used

- (1) SPENCER [USC00128290], Spencer, IN
- (2) CARBONDALE SEWAGE PLT [USC00111265], Carbondale, IL
- (3) SHAKAMAK SP [USC00127959], Jasonville, IN

- (4) JERSEYVILLE 2 SW [USC00114489], Jerseyville, IL
- (5) CARBONDALE SOUTHERN IL AP [USW00093810], De Soto, IL

Influencing water features

These areas are in the floodplains of perennial streams and may be impacted regularly by flooding and ponding. They also have a seasonal high water table (fall to spring).

Wetland description

This site is in the RIVERINE wetlands class of the Hydrogeomorphic (HGM) classification system (Brinson, 1993), and are Forested Palustrine wetlands (Cowardin et al., 1979).

Soil features

Soils are very deep, poorly to very poorly drained and formed in silty alluvium and mixture of loess and/or local silty alluvium. Current series include Banlic, Beaucoup, Birds, Bonnie, Coffeen, Creal, Dupo, Holton, Orion, Otter, Petrolia, Piopolis, Racoon, Shoals, Stendal, Tice, Titus, Wabash, Wakeland, and Wilhite.

Table 4. Representative soil features

Parent material	(1) Alluvium
Surface texture	(1) Silt loam (2) Silty clay loam (3) Silty clay
Drainage class	Very poorly drained to somewhat poorly drained
Permeability class	Very slow to moderate
Soil depth	80 in
Surface fragment cover <=3"	0–5%
Surface fragment cover >3"	0%
Available water capacity (0-40in)	5–9.5 in
Calcium carbonate equivalent (0-40in)	0%
Electrical conductivity (0-40in)	0–2 mmhos/cm
Sodium adsorption ratio (0-40in)	0
Soil reaction (1:1 water) (0-40in)	4.5–7.8
Subsurface fragment volume <=3" (0-40in)	0–5%
Subsurface fragment volume >3" (0-40in)	0–1%

Ecological dynamics

These occurs on low-lying floodplains and are characterized by a mature deciduous floodplain with a high canopy diversity. Common species on these sites included silver maple , green ash, American elm, swamp white oak, cherrybark oak (southern Illinois), pin oak, sweetgum, American sycamore, hawthorns, willows, and dogwoods. Sites that are frequently flooded for a long duration will have a higher percentage of species that can tolerate excess moisture for extended periods of time.

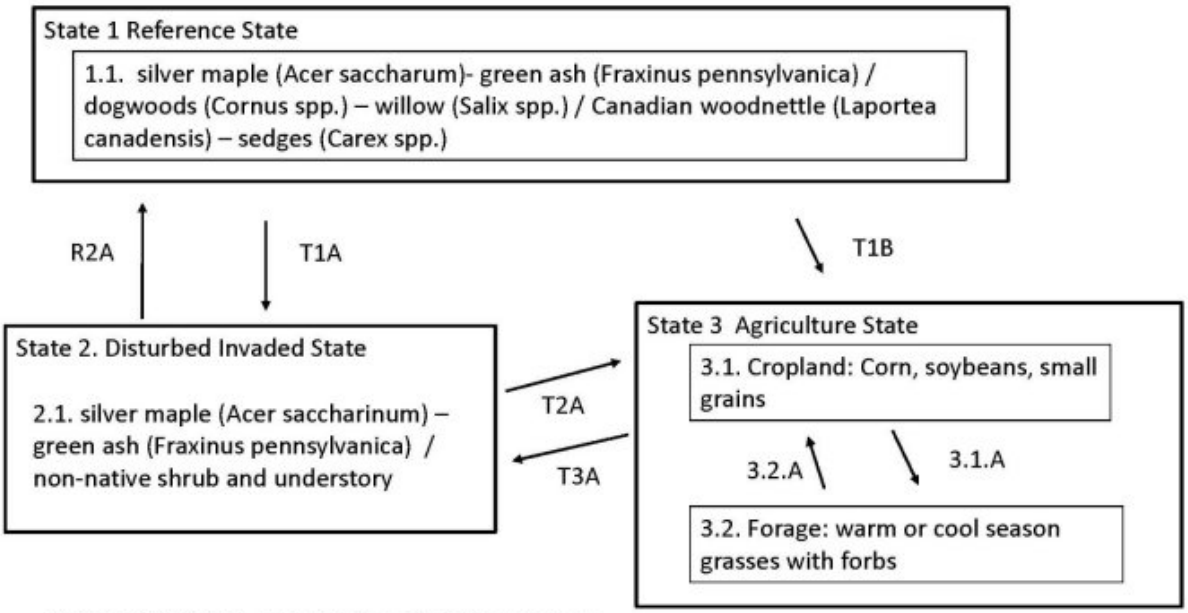
Historically, the floodplains were a very dynamic systems with frequent flooding and ponding; however, decades of

floodplain and river management has drastically altered the natural dynamic processes. Oaks have been removed on most of the remaining wooded sites. Common trees on site now include boxelder, silver maple, green ash, American elm, hackberry, and cottonwood.

Sites not ditched or tiled are still influenced by seasonal high water tables and poor drainage. Sites often flood in the winter and spring and in some years, flooding can extend into the growing season. Although this community can be early-successional due to prolonged flooding, this is a generally a long-lived community. Species variability and composition within this community are considerable as a result of a mosaic of moisture conditions controlled by seasonal flooding and topographic differences. (NatureServe 2018)

Most of these sites are now cleared and utilized for agriculture.

State and transition model



F114BY203IN, Wet Floodplain Forest

State 1
Reference State

The historical reference state for this ecological site was old growth riverine forest. The forest was composed of silver maple, green ash, water-tolerant oaks, common hackberry, American elm, willow, cottonwood, and sycamore. Periodic disturbances from flooding, wind or ice maintained the open, uneven structure and ground flora species. Long disturbance-free periods allowed an increase in both the density of trees and the abundance of shade tolerant species. Reference states are extremely rare today as most sites have been disturbed through oak removal, clearing, hydrological modifications, agriculture and development.

Dominant plant species

- silver maple (*Acer saccharinum*), tree
- green ash (*Fraxinus pennsylvanica*), tree
- oak (*Quercus*), tree
- dogwood (*Cornus*), shrub
- willow (*Salix*), shrub
- sedge (*Carex*), grass
- Canadian woodnettle (*Laportea canadensis*), other herbaceous
- jewelweed (*Impatiens capensis*), other herbaceous

Community 1.1
Reference Community

Reference sites are a mature deciduous floodplain forest. Community composition will depend upon flooding regimes.

Dominant plant species

- silver maple (*Acer saccharinum*), tree
- green ash (*Fraxinus pennsylvanica*), tree
- oak (*Quercus*), tree
- dogwood (*Cornus*), shrub
- willow (*Salix*), shrub
- sedge (*Carex*), grass
- Canadian woodnettle (*Laportea canadensis*), other herbaceous
- jewelweed (*Impatiens capensis*), other herbaceous

State 2
Disturbed Invaded State

These sites have had historic or current disturbances including selective harvest, clear cutting, grazing, development, and presence of invasive species. Species on site will depend on type and severity of disturbance, seed sources, and any previous management inputs.

Dominant plant species

- maple (*Acer*), tree
- ash (*Fraxinus*), tree
- willow (*Salix*), shrub
- honeysuckle (*Lonicera*), shrub
- reed (*Phragmites*), grass
- sedge (*Carex*), grass
- purple loosestrife (*Lythrum salicaria*), other herbaceous
- garlic mustard (*Alliaria petiolata*), other herbaceous

Community 2.1
Disturbed Invaded Community

Sites have had historic or current disturbances including selective harvest, clear cutting, grazing, development, and presence of invasive species. Species on site will depend on level of disturbance, seed sources, and management inputs.

Dominant plant species

- maple (*Acer*), tree
- ash (*Fraxinus*), tree
- cottonwood (*Populus*), tree
- honeysuckle (*Lonicera*), shrub
- reed (*Phragmites*), grass
- sedge (*Carex*), grass

- garlic mustard (*Alliaria petiolata*), other herbaceous
- purple loosestrife (*Lythrum salicaria*), other herbaceous

State 3
Agricultural State

The majority of these sites are currently intensively cropped. Species depend on landowner objectives. Common crops include a corn to soybean to corn rotation. A smaller percentage of acres are utilized as forage. Species will depend upon landowner's management goals. Landowners should be aware of potential wetland issues on many of these sites. Sites in production have often been ditched and /or tiled.

Dominant plant species

- fescue (*Festuca*), grass
- clover (*Trifolium*), other herbaceous
- corn (*Zea mays*), other herbaceous
- soybean (*Glycine max*), other herbaceous

Community 3.1
Cropland

This phase is characterized by row crop agriculture of small grains, commonly corn and soybeans. A large number of row crops could be grown on these sites. Species will be determined by landowner goals and objectives. Hydrology modifications may be present.

Dominant plant species

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

Community 3.2
Forage/ Pastureland

This phase is characterized by production of forage. Different mixes of, generally, cool season grasses and forbs, largely clovers, are grown. Species planted on these sites depending on the management objectives.

Dominant plant species

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

Pathway 3.1.A
Community 3.1 to 3.2

Management inputs would include seeding of desired grass and forb species.

Pathway 3.2.A
Community 3.2 to 3.1

Planting, either by conventional or no-till methods, of row crop. Inputs are management activities that keeps the site in row crop production such as applying fertilizer and weed control treatments.

Transition T1A
State 1 to 2

Large scale canopy disturbance such as clearing or selective harvest. Little or no post-harvest timber stand

management. No control of non-native species.

Transition T1B
State 1 to 3

Clearing of mature high-quality forest for conversion to agricultural production. Landowners should be aware of potential wetland issues on these sites prior to clearing.

Restoration pathway R2A
State 2 to 1

Restoration of site would include planting of desired species and timber stand improvement activities. Restoration of natural hydrology may be required depending on previous disturbances.

Transition T2A
State 2 to 3

Transition from disturbed forest to agricultural state. Activities would be determined by the landowner's production objectives. Landowners should be aware of any potential wetland issues on these sites.

Transition T3A
State 3 to 2

Cropland or pastureland that is abandoned will slowly, but naturally, transition to a mixed deciduous woodland usually dominated by fast growing trees such as maple and ash. Numerous non-native species may be present.

Additional community tables

Inventory data references

No field monitoring was conducted as part of this PES development. Future ESD development may result in plant community edits, soil mapunits being added or removed from this grouping, and/or additions or modifications to the narratives, tables, vegetation descriptions and state and transition model.

Other references

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Contributors

John Allen, Acting Soil Survey Office Leader, USDA-NRCS, Indiana
Dena Anderson, Resource Soil Scientist, USDA-NRCS, Indiana
Ralph Tucker, Soil Survey Office Leader, USDA-NRCS, Missouri
Anita Arends, Ecological Site Specialist, USDA-NRCS, Illinois

Approval

Suzanne Mayne-Kinney, 11/16/2023

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	05/06/2024
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):**

   _____

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

   _____

10. **Effect of community phase composition (relative proportion of different functional groups) and spatial distribution on infiltration and runoff:**

    _____

11. **Presence and thickness of compaction layer (usually none; describe soil profile features which may be mistaken for compaction on this site):**

    _____

12. **Functional/Structural Groups (list in order of descending dominance by above-ground annual-production or live foliar cover using symbols: >>, >, = to indicate much greater than, greater than, and equal to):**

    Dominant:

    Sub-dominant:

    Other:

    Additional:

    _____

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

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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:**
