

Ecological site F114XA102IN

Lacustrine Terrace Forest

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General information

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

MLRA notes

Major Land Resource Area (MLRA): 114X–Southern Illinois and Indiana Thin Loess and Till Plain

Overview of the MLRA MLRA 114 makes up about 4,550 square miles (11,795 square kilometers). The three parts of this MRLA are mostly in the Till Plains Section of the Central Lowland Province of the Interior Plains. The western third of the western part is in the Highland Rim Section of the Interior Low Plateaus Province of the Interior Plains. The eastern half of the eastern part is in the Kanawha Section of the Appalachian Plateaus Province of the Appalachian Highlands. Both large and small tributaries of the Ohio River dissect the nearly level to very steep glaciated uplands in this area. The major streams and rivers have well defined valleys with broad flood plains and numerous stream terraces. The flood plains along the smaller streams are narrow. Broad summits are nearly level to gently sloping. Elevation ranges from 320 feet (100 meters) on the southernmost flood plain along the Ohio River to 1,250 feet (380 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. Also, the Ohio River bluffs are as much as 300 feet (90 meters) above the river valley floor.

Classification relationships

US Forest Service EcoRegion: 222 Eastern Broadleaf Forest (Continental) Province Homoya's Natural Regions of Indiana: Bluegrass Region The following NatureServe Explorer Ecological System has a high level of probability to match the ecological site found on these soils. Field verification and ESD development is needed prior to using this information for conservation planning and/or restoration initiatives: South-Central Interior Mesophytic Forest CES 202.887.

Ecological site concept

The Sloping Lacustrine Forest site is found on sloping lacustrine soils and are a mesic hardwood forest with a substantial oak component. Species include sugar maple, northern red oak, American beech, sugar maple, white oak, tulip tree, white ash, and basswood. Understory vegetation density and composition will depend on canopy cover, micro-topography, and disturbance regime and may vary from site to site. The high-quality sites will exhibit a diverse array of native herbaceous species including numerous spring wildflowers. Understory herbaceous and shrub species present in examples of this system can vary. Stands dense tree cover have less shrub and herbaceous species while stand with more open tree canopy cover will tend to have a dense understory. The most abundant component of the shrub layer is often samplings of canopy trees.

Associated sites

F114XA101IN	Wet Lacustrine Forest Wet Lacustrine Forest. These sites are very poorly drained to somewhat poorly drained.
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Similar sites

F114XA501IN	Wet Till Flatwoods Wet Till Forest. These sites are on till plains and share many similar species.
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Table 1. Dominant plant species

Tree	(1) <i>Quercus rubra</i> (2) <i>Acer saccharum</i>
Shrub	(1) <i>Viburnum acerifolium</i> (2) <i>Lindera benzoin</i>
Herbaceous	(1) <i>Asarum canadense</i> (2) <i>Galium circaeans</i>

Physiographic features

These sites are found on stream terraces and lake plains. Slopes generally range from 8-20%.

Figure 1. Physiographic Image – Block diagram with Dubois, Haubstadt and Otwell representing a site on the landscape.

Table 2. Representative physiographic features

Landforms	(1) Valley > Terrace (2) Lake plain
Runoff class	Low to very high
Flooding frequency	None
Ponding frequency	None
Elevation	100 – 310 m
Slope	0 – 20 %
Water table depth	20 – 180 cm
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)	150-160 days
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Freeze-free period (characteristic range)	180-180 days
Precipitation total (characteristic range)	1,170-1,190 mm
Frost-free period (actual range)	150-160 days
Freeze-free period (actual range)	180-180 days
Precipitation total (actual range)	1,170-1,190 mm
Frost-free period (average)	160 days
Freeze-free period (average)	180 days
Precipitation total (average)	1,170 mm

- (1) NORTH VERNON 2 ESE [USC00126435], North Vernon, IN
- (2) SEYMOUR 2 N [USC00127935], Seymour, IN
- (3) MILFORD [USC00335268], Milford, OH

Influencing water features

This ecological site is not influenced by wetland or riparian water features. Some sites may have a seasonally high water table.

Soil features

Soils are somewhat poorly drained to moderately well drained, and very slow to moderate permeable soils, with acidic to neutral soil reaction, that formed in glaciolacustrine deposits and lacustrine deposits. Soils are very deep but may have a restrictive layer between 20-40". Soil series currently in this group include Bartle, Dubois, Haubstadt, Otwell, and Pekin.

Table 4. Representative soil features

Parent material	(1) Loess (2) Lacustrine deposits (3) Outwash (4) Alluvium
Surface texture	(1) Silt loam
Drainage class	Somewhat poorly drained to moderately well drained
Permeability class	Very slow to moderate

Depth to restrictive layer	60 – 100 cm
Soil depth	200 cm
Surface fragment cover <=3"	Not specified
Surface fragment cover >3"	Not specified
Available water capacity (Depth not specified)	11.43 – 19.56 cm
Soil reaction (1:1 water) (Depth not specified)	4.4 – 5.9
Subsurface fragment volume <=3" (Depth not specified)	0 – 10 %
Subsurface fragment volume >3" (Depth not specified)	Not specified

Ecological dynamics

The historic plant community of the Lacustrine Forest ecological site is a mesic hardwood forest with a strong oak component. On high quality sites, the major canopy species include northern red oak (*Quercus rubra*), white oak (*Q. alba*), sugar maple (*Acer saccharum*), American beech (*Fagus grandifolia*), basswood (*Tilia americana*) and tulip-tree (*Liriodendron tulipifera*). Other species on site may include black walnut (*Juglans nigra*), shagbark hickory (*Carya ovata*), bitternut hickory (*Carya cordiformis*), American elm (*Ulmus americana*), and white ash (*Fraxinus americana*). Numerous native understory species are found on these sites.

According to USDA-USFS LANDFIRE data, full stand replacement fires on these sites were rare (

State and transition model

Additional community tables

Table 5. Community 1.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production ()	Foliar Cover (%)
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Table 6. Community 2.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production ()	Foliar Cover (%)
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Table 7. Community 3.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production ()	Foliar Cover (%)
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Table 8. Community 3.2 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production ()	Foliar Cover (%)
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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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Approval

Greg Schmidt, 9/26/2024

Acknowledgments

PES documents developed for adjacent MLRAs in Indiana and Ohio served as a source of information as these MLRAs often shared similar soil series with MLRA 114A. NRCS county soil surveys where a valuable reference including tree species observed on site by NRCS staff. Soil Survey and NRCS Indiana resource soil scientists contributed field observation, field notes, and extensive soil mapping expertise. In accordance with Federal Civil Rights law and U.S. Department of Agriculture (USDA) Civil Rights regulations and policies, the USDA, its agencies, offices, and employees, and institutions participating in or administering USDA programs are prohibited from discriminating based on race, color, national origin, religion, sex, gender identity (including gender expression), sexual orientation, disability, age, marital status, family/parental status, income derived from a public assistance program, political beliefs, or reprisal or retaliation for prior credible activity, in any program or activity conducted or funded by USDA (not all bases apply to all programs). Remedies and complaint filing deadlines vary by program or incident. Persons with disabilities who require alternative means of communication for program information (e.g., Braille, large print, audiotope, American Sign Language, etc.) should contact the responsible Agency or USDA's TARGET Center at (202) 720-2600 (voice and TTY) or contact USDA through the Federal Relay Service at (800) 877-8339. Additionally, program information may be made available in languages other than English. To file a program discrimination complaint, complete the USDA Program Discrimination Complaint Form, AD-3027, found online at [How to File a Program Discrimination Complaint](https://www.usda.gov/offerings/programs/discrimination-complaint) and at any USDA office or write a letter addressed to USDA and provide in the letter all of the information requested in the form. To request a copy of the complaint form, call (866) 632-9992. Submit your completed form or letter to USDA by: (1)

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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)	A. Arends, ESI Specialist
Contact for lead author	
Date	09/24/2026
Approved by	
Approval date	
Composition (Indicators 10 and 12) based on	Annual Production

Indicators

1. Number and extent of rills:

2. Presence of water flow patterns:

3. Number and height of erosional pedestals or terracettes:

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

5. Number of gullies and erosion associated with gullies:

6. Extent of wind scoured, blowouts and/or depositional areas:

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

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

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

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

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

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

Dominant:

Sub-dominant:

Other:

Additional:

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

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

15. Expected annual annual-production (this is TOTAL above-ground annual-production, not just forage annual-production):

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

17. Perennial plant reproductive capability:
