

Ecological site F114XA501IN

Wet Till Flatwoods

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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

MLRA 114A 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

USFS: 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: North-Central Interior Wet Flatwoods, Unique Identifier: CES202.700

Ecological site concept

The Wet Till Flatwoods state is a mature forest with wet-tolerant species including swamp white oak, pin oak, sweetgum, beech, green ash, and maple. Swamp chestnut oak and blackgum may also be present. Stands occur on somewhat poorly drained to poorly drained uplands or in depressions on level glacial lakeplains or outwash plains. There is an impermeable or nearly impermeable clay resulting in a shallow, perched water table. Ponding is common during the wet seasons and droughts in the summer, leading to a complex of forest upland and wetland species. Deciduous hardwoods and softwoods predominate. Shrubs may include black chokeberry (*Aronia melanocarpa*), paw paw (*Asimina triloba*), and strawberry bush (*Euonymus obovatus*). The herbaceous layer, can be sparse to dense, depending on the ponding regime. Length of flooding and depth of clay layer will influence the understory native plant community. Understory species may include *Boehmeria cylindrica*, multiple *Carex* species (*Carex blanda*, *Carex laxiculmis*, *Carex squarrosa*, *Carex intumescens*, etc.), *Elymus riparius*, *Elymus virginicus*, *Cardamine bulbosa*, *Cardamine pensylvanica*, *Claytonia virginica*, *Oxalis violacea*, *Podophyllum peltatum*, *Galium tinctorium*, *Glyceria striata*, *Mitchella repens*, *Osmunda regalis*, *Osmunda cinnamomea*, and *Cinna arundinacea*. The majority of these sites are now agricultural and being utilized as cropland or pastureland. Natural hydrology has been modified via tiling and ditching Few mature, high-quality, reference communities still exist today.

Associated sites

F114XA502IN	Till Uplands The Till Uplands groups is associated geographically but consists of better drained soil series and more upland plant communities.
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Similar sites

F114XA101IN	Wet Lacustrine Forest Wet Lacustrine Forest. This sites also have wet-tolerant forest species.
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Table 1. Dominant plant species

Tree	(1) <i>Quercus palustris</i> (2) <i>Liquidambar styraciflua</i>
Shrub	(1) <i>Asimina triloba</i> (2) <i>Cornus</i>
Herbaceous	(1) <i>Carex</i>

Physiographic features

These sites are located on somewhat poorly drained to poorly drained till uplands or in depressions on glacial lakeplains or outwash plains.

Figure 1. Physiographic Image - Block diagram with Avonburg and Clermont soils.

Table 2. Representative physiographic features

Landforms	(1) Upland > Till plain
Runoff class	Negligible to very low
Flooding frequency	None
Ponding duration	Very brief (4 to 48 hours) to long (7 to 30 days)
Ponding frequency	None to frequent
Elevation	90 – 310 m
Slope	0 – 10 %
Ponding depth	0 – 30 cm
Water table depth	0 – 30 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
Freeze-free period (characteristic range)	180-190 days
Precipitation total (characteristic range)	1,120-1,190 mm
Frost-free period (actual range)	150-160 days
Freeze-free period (actual range)	180-190 days
Precipitation total (actual range)	1,090-1,190 mm
Frost-free period (average)	160 days
Freeze-free period (average)	180 days
Precipitation total (average)	1,140 mm

- (1) HILLSBORO [USC00333758], Hillsboro, OH
- (2) NORTH VERNON 2 ESE [USC00126435], North Vernon, IN
- (3) SCOTTSBURG [USC00127875], Scottsburg, IN

Influencing water features

Drainage and permeability (slow to moderate) along with landscape position lead much of the site being ponded, most often in the spring and occasionally in the fall.

Soil features

Soils in this groups are generally somewhat poorly to poorly drained till soils. Series include Atlas, Avonburg, Blanchester, Clermont, and Cobbssfork.

Table 4. Representative soil features

Parent material	(1) Loess (2) Till (3) Lacustrine deposits
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Surface texture	(1) Silty clay loam (2) Silt loam
Drainage class	Somewhat poorly drained to very poorly drained
Permeability class	Very slow to slow
Depth to restrictive layer	60 – 130 cm
Soil depth	150 – 200 cm
Surface fragment cover <=3"	0 – 10 %
Surface fragment cover >3"	Not specified
Available water capacity (12.7-20.3cm)	Not specified
Soil reaction (1:1 water) (11.4-17.8cm)	Not specified
Subsurface fragment volume <=3" (0-7.6cm)	Not specified
Subsurface fragment volume >3" (0-2.5cm)	Not specified

Ecological dynamics

Vegetation on these sites are influenced by the soil characteristics which include a sol layer that creates a seasonal, shallow perched water table. Ponding is common during the wetter seasons with dry conditions occurring during the summer and early autumn.

Microtopography,, drainage, and the fluctuating moisture conditions lead to a mosaic of forest wetland and upland species across the broader landscape. On the wetter portions of these sites, water-tolerant oaks such as pin oak (*Quercus palustris*), swamp chestnut oak (*Q. michauxii*), and/or swamp white oak (*Q. bicolor*) dominate. Associate tree species may including red maple (*Acer rubrum*), sweetgum (*Liquidambar styraciflua*), green ash (*Fraxinus pennsylvanica*), and silver maple (*Acer saccharinum*). In slightly better drained micro-sites, more mesic upland species may be found including red oak (*Q. rubra*), white oak (*Q. alba*), American beech (*Fagus grandifolia*), tulip poplar (*Liriodendron tulipifera*), white ash (*Fraxinus americana*), and hickories (*Carya* spp.).

Most of these sites have been functionally alter through disturbance. Agriculture and urban development are now the biggest uses of these soil. Hydrology modification such as tiling and ditching have occurred on the majority of sites.

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

NRCS References

PES documents developed for adjacent MLRAs in Indiana and Ohio served as a source of information as these MLRAs often split counties and/or shared similar soil series with MLRA 114A. USDA-NRCS county soil surveys for the counties within MLRA 114A where a valuable reference including tree species observed on site by NRCS staff. NRCS Indiana resource soil scientists contributed field observation, field notes, and extensive soil mapping expertise.

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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 regions 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, audiotape, 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 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) mail: U.S. Department of Agriculture, Office of the Assistant Secretary for Civil Rights, 1400 Independence Avenue, SW, Washington, D.C. 20250-9410; (2) fax: (202) 690-7442; or (3) email: program.intake@usda.gov. USDA is an equal opportunity provider, employer, and lender.

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	09/30/2026
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:
