

Ecological site F111XB203IN

Wet Alluvium Forest

Last updated: 9/11/2024

Accessed: 09/18/2026

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): 111X–Indiana and Ohio Till Plain

111B – Indiana and Ohio Till Plain, Northeastern Part. This area is in the Eastern Lake and Till Plains Sections of the Central Lowland Province of the Interior Plains. The entire MLRA is glaciated, and most areas are dominated by ground moraines that are broken in places by lake plains, outwash plains, flood plains, and many recessional moraines. The ground moraines and lake plains in front of the recessional moraines are flat to undulating. In many places stream valleys occur at the leading edge of the recessional moraines. Narrow, shallow valleys commonly are along the major rivers and streams in this MLRA, and some areas along the major rivers and streams have deposits of sand. Elevation ranges from 630 to 1,550 feet (190 to 470 meters), increasing gradually from west to east. Relief is mainly a few meters, but in some areas hills rise as much as 100 feet (30 meters) above the adjoining plains. The extent of the major Hydrologic Unit Areas (identified by four-digit numbers) that make up this MLRA is as follows: Western Lake Erie (0410), 41 percent; Wabash (0512), 28 percent; Scioto (0, 28 percent; Scioto (0506), 10 percent; St. Clair-Detroit (0409), 9 percent; Great Miami (0508), 6 percent; Southeastern Lake Michigan (0405), 5 percent; and Southwestern Lake Huron (0408), 1 percent. The Huron River in Michigan, Cedar Creek in Indiana, and the Sandusky River in Ohio have been designated as National Wild and Scenic Rivers in this MLRA. The surficial materials in this area include glacial deposits of till, outwash, and lacustrine sediments from Wisconsin and older glacial periods. A thin mantle of loess occurs in some areas. Most of the MLRA is underlain by Silurian and Devonian limestone and dolostone. Middle Devonian to Early Mississippian black shale and Early to Middle Mississippian siltstone and shale are in some areas of the northern part of the MLRA.

Classification relationships

Hierarchical Classification Relationships Major Land Resource Area (USDA-Natural Resources Conservation Service, 2006) USFS Ecological Regions (USDA, 2007): Sections –Central Till Plains, Beech Maple (222H), South Central Great Lakes (222J) Subsections – Bluffton Till Plains (222Ha), Bluffton-Ann Arbor Till Plains (222Je), Jackson Interlobate Moraine (222Jg), Steuben Interlobate Moraines (222Ji) NatureServe Systems anticipated (NatureServe, 2011): Agriculture - Cultivated Crops and Irrigated Agriculture, Agriculture – Pasture/Hay, North-Central Interior Beech-Maple Forest LANDFIRE Biophysical Settings anticipated (USGS, 2010): Central Interior and Appalachian Floodplain Systems, Central Interior and Appalachian Riparian Systems, North-Central Interior Beech-Maple Forest

Ecological site concept

This site is a wetland/riparian site formed on alluvial parent materials that are very poorly to somewhat poorly drained. It is located along the floodplain, often on steps, natural levees, and terraces, of lotic systems in loamy alluvial deposits overlaying coarser materials. The site is generally constrained to a narrow landscape position that is influenced by the adjacent uplands and riparian areas. Flooding and ponding can be nonexistent to frequent, depending on the riparian system with durations up to 30 days. The characteristic vegetation of the site is that of a riparian forest dominated principally by silver maple and swamp white oak. Additional canopy level species include green ash, sugar maple, elm, and basswood. Active hydrologic and geomorphic process, along with windthrow of established trees, drive the long interval disturbance regime of this tree dominated site. These macro and micro scale disturbance events creates mixed-aged forests that contains both late and early seral species. These dynamics have been drastically changed due to the installation of levees, dams, and channelization of the system. Establishment woody non-native, invasive species, followed by no management to control them, can alter the state of the site. The invasive species can persist in the understory as a component and then spread rapidly with an opening in the canopy. They can come to dominate the understory of the site, while the canopy level species remain, relatively, unchanged. Removal of the woody species, installation of tile, and agricultural practices move this site to a new state. Much of the historic acres of this site have been transitioned to agriculture with the bulk of those acres being in corn and soybean rotations.

Associated sites

F111XB201IN	Wet Alluvium Floodplain Soils are in the aquic taxonomic suborder
F111XB202IN	Dry Alluvium Floodplain Soils are not in the aquic taxonomic suborder
F111XB204IN	Dry Alluvium Forest Soils are moderately well drained or drier

Similar sites

F111XB101IN	Lacustrine Flatwood Lacustrine Flatwoods. Located on lacustrine parent material; soils are very poorly to poorly drained
F111XB201IN	Wet Alluvium Floodplain Wet Alluvium Floodplain. Soils are in the aquic taxonomic suborder

Table 1. Dominant plant species

Tree	(1) <i>Quercus bicolor</i> (2) <i>Acer saccharinum</i>
Shrub	Not specified
Herbaceous	Not specified

Physiographic features

This site is located in the 111B - Indiana and Ohio Till Plain, Northeastern Part MLRA. It is classified as a wetland/riparian site. This site was formed in loamy alluvium on flood plains. This creates a long, linear expression of the site on the landscape with slopes ranging from 0 to 2 percent.

Figure 1. Block diagram with Shoals representing the site on the landscape.

Table 2. Representative physiographic features

Landforms	(1) River valley > Stream
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	Brief (2 to 7 days) to long (7 to 30 days)
Ponding frequency	None to frequent
Elevation	100 – 350 m
Slope	0 %
Ponding depth	0 – 80 cm
Water table depth	10 – 60 cm
Aspect	Aspect is not a significant factor

Climatic features

The average annual precipitation in this area is 30 to 39 inches (760 to 990 millimeters). Most of the rainfall occurs as convective thunderstorms during the growing season. About half or more of the annual precipitation occurs during the freeze-free period. Snowfall is common in winter. The average annual temperature is 47 to 52 degrees F (8 to 11 degrees C). The freeze-free period averages about 180 days and ranges from 165 to 195 days.

Table 3 Representative climatic features

Frost-free period (characteristic range)	120-150 days
Freeze-free period (characteristic range)	160-180 days
Precipitation total (characteristic range)	940-1,020 mm
Frost-free period (actual range)	110-150 days
Freeze-free period (actual range)	130-190 days
Precipitation total (actual range)	840-1,040 mm
Frost-free period (average)	130 days
Freeze-free period (average)	170 days

Precipitation total (average)	970 mm
-------------------------------	--------

- (1) HUNTINGTON [USC00124181], Huntington, IN
- (2) MARION 2 N [USC00125337], Marion, IN
- (3) WABASH [USC00129138], Wabash, IN
- (4) LIMA WWTP [USC00334551], Lima, OH
- (5) PONTIAC OAKLAND CO INTL AP [USW00094817], Waterford, MI
- (6) ANN ARBOR SE [USC00200228], Ann Arbor, MI
- (7) HILLSDALE [USC00203823], Hillsdale, MI
- (8) COLUMBIA CITY [USC00121739], Columbia City, IN
- (9) HARTFORD CITY 4 ESE [USC00123777], Hartford City, IN

Influencing water features

This site is characterized by its location in a floodplain of a perennial stream and there it is most affected by the flooding, scouring, and channel movement of the adjacent lotic system. Flooding can be frequent with a long (7 to 30 day) duration depending on the riverine system. Ponding can occur up to frequently with a brief (2 to 7 days) to long duration (7 to 30 days). The proximity of the site to a perennial stream/river and therefore low topographic location result in a seasonally high water table in the spring that recedes somewhat during the summer. Levees, dams, and channelization have greatly altered the hydrology and flooding of the riparian systems in many places.

Wetland description

The hydrogeographic model classification for this site is RIVERINE: Alluvial Plain, Stream Terrace, Flood Plain; forested. This site has a Cowardin Classification of PFO6An; it is a forested palustrine system that is temporarily flooded on mineral soil.

Soil features

The soil series associated with this site are: Washtenaw, Wabasha, Shoals, Orrville, Newark, Defiance, Coesse, Algiers. They are deep, very poorly drained to somewhat poorly drained, and slow to moderately rapid permeable soils, with slightly acidic to neutral soil reaction that formed in alluvium.

Parent Materials Kind: alluvium
 Surface Texture: clay loam, loam, silt loam, silty clay, silty clay loam
 Subsurface Texture group: loamy

Figure 8. Location of mapunits within the MLRA.

Table 4. Representative soil features

Parent material	(1) Alluvium
Surface texture	(1) Clay loam (2) Loam (3) Silt loam (4) Silty clay (5) Clay loam
Drainage class	Very poorly drained to somewhat poorly drained

Permeability class	Slow to moderately rapid
Soil depth	100 – 200 cm
Surface fragment cover <=3"	Not specified
Surface fragment cover >3"	Not specified
Available water capacity (Depth not specified)	13.72 – 21.08 cm
Calcium carbonate equivalent (Depth not specified)	0 – 10 %
Electrical conductivity (Depth not specified)	Not specified
Sodium adsorption ratio (Depth not specified)	Not specified
Soil reaction (1:1 water) (Depth not specified)	6.3 – 7.3
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 Wet Alluvium Forest ecological site is a riparian forest. The dominant species in the canopy are silver maple and swamp white oak, with green ash being common as well. This site is the result of hydrologic and geomorphic process at the macro scale and windthrow on a more local scale. The disturbance regime is one of somewhat frequent low intensity flooding events punctuated by high intensity events (ie. 100+ year floods, tornados, or ice storms). Micro scale disturbance such as windthrow or localized mortality lead the site to being a mixed-age forest.

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 (%)
-------	-------------	--------	-----------------	----------------------	------------------

Table 6. Community 2.1 plant community composition

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

Table 7. Community 3.1 plant community composition

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

Table 8. Community 3.2 plant community composition

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

Inventory data references

Site concept developed through expert opinion, review of the literature, and field work.

Other references

Braun, E. Lucy. 2001. Deciduous forests of eastern North America. Caldwell, N.J.: Blackburn Press.

Federal Geographic Data Committee. 2013. Classification of wetlands and deepwater habitats of the United States. FGDC-STD-004-2013. Second Edition. Wetlands Subcommittee, Federal Geographic Data Committee and U.S. Fish and Wildlife Service, Washington, DC.

Homoya, M. A., Abrell, D. B., Aldrich, J. R., & Post, T. W. (1985). The Natural Regions of Indiana. Indiana Academy of Science , 94, 245-269.

NatureServe. (2011). An online encyclopedia of life [web application]. NatureServe, Arlington, VA, USA [Online: [www. natureserve. org/explorer](http://www.natureserve.org/explorer)] .

Jackson, Marion T. 1997. The Natural heritage of Indiana. Bloomington: Indiana University Press, published in association with the Indiana Department of Natural Resources and the Indiana Academy of Science.

Johnson, Paul S., Stephen R. Shifley, and Robert Rogers. 2002. The ecology and silviculture of oaks. Wallingford, Oxon: CABI

Upland Oak Ecology Symposium, and Martin A. Spetich. 2004. Upland Oak Ecology Symposium: history, current conditions, and sustainability : Fayetteville, Arkansas, October 7-10, 2002. [Asheville, NC]: [Southern Research Station].

USDA. (2007). Ecological Subregions: Sections and Subsections for the Conterminous United States. Washington, DC: USDA - Forest Service.

USDA. (2006). Land Resource Regions and Major Land Resource Areas of the United States, the Caribbean, and the Pacific Basin. U. S. Department of Agriculture, Natural Resources Conservation Service. U. S. Department of Agriculture Handbook 296.

USDA-NRCS. 2008. Hydrogeomorphic Wetland Classification System: An Overview and Modification to Better Meet the Needs of the Natural Resources Conservation Service. Technical Note No. 190–8–76. Washington D.C.

USGS. (2010). LANDFIRE Biophysical Settings. Retrieved from <http://www.landfire.gov>

Whitaker, John O., Charles J. Amlaner, Marion T. Jackson, George R. Parker, and Peter Evans Scott. 2012. Habitats and ecological communities of Indiana presettlement to present. Bloomington: Indiana University Press.

Approval

Greg Schmidt, 9/11/2024

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)	Tyler Staggs
Contact for lead author	
Date	09/18/2026
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:
