

Ecological site F111XB501IN

Till Depression

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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): 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.

Ecological site concept

This site is an upland site formed on glacial till parent materials. It is located on concave landscape positions in the depressions (toeslopes and footslopes) of glacial till plains and moraines. Soils have loamy surface textures with a mucky modifier, are very poorly to poorly drained, exhibit up to frequent ponding that can last more than 30 days. The characteristic vegetation of the site is that of a flatwoods type dominated by pin oak and swamp white oak, with cottonwood, green ash, and silver maple being common in the canopy as well. The large, seasonal fluctuation of water on the site allows for the co-existence of upland and lowland trees. Inundation of the site generally occurs in the spring which leads to a sparse and patchy understory. Fire did occur on the site, but high intensity fires were rare. Low intensity surface fires were more common on sites that are adjacent to more fire prone sites such as prairies and savannas. Ponding in the spring followed by summer drought along with windthrow were the most dominant disturbance factors. A large portion of this site has been drained and is in agricultural production. The majority of the converted acres is used for small grain rotations, specifically corn and soybeans. A much smaller amount of the site is also used for growing forage that is used for pasture or hay production. These sites are predominately cool season grass species and legumes such as tall fescue and clover species.

Associated sites

F111XB502IN	Wet Till Ridge Wet Till Ridge. On a convex landscape position and somewhat poorly drained (SWPD).
F111XE503IN	Till Ridge Till Ridge. On a convex landscape position and moderately well to well drained.

Similar sites

F111XB203IN	Wet Alluvium Forest Wet Alluvium Forest.
F111XB101IN	Lacustrine Flatwood Lacustrine Forest.

Table 1. Dominant plant species

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

Physiographic features

This ecological site is found in outwash plain landscapes in MLRA 111B: Indiana and Ohio Till Plain, Northeastern Part. Unique landforms that contain this site include depressions, drainageways, till plains, and ground moraines. Slopes are generally flat, ranging from 0 to 2 percent.

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

Table 2. Representative physiographic features

Landforms	(1) Till plain (2) Ground moraine (3) Drainageway (4) Till plain
Runoff class	Negligible to low
Flooding frequency	None
Ponding duration	Brief (2 to 7 days) to very long (more than 30 days)
Ponding frequency	None to frequent
Elevation	180 – 430 m

Slope	0 %
Ponding depth	0 – 80 cm
Water table depth	0 – 150 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)	140-150 days
Freeze-free period (characteristic range)	170-180 days
Precipitation total (characteristic range)	910-990 mm
Frost-free period (actual range)	140-150 days
Freeze-free period (actual range)	160-190 days
Precipitation total (actual range)	840-1,020 mm
Frost-free period (average)	140 days
Freeze-free period (average)	180 days
Precipitation total (average)	940 mm

- (1) CELINA 3 NE [USC00331390], Celina, OH
- (2) KENTON [USC00334189], Kenton, OH
- (3) MONTPELIER [USC00335438], Montpelier, OH
- (4) PORTLAND 1 SW [USC00127069], Portland, IN
- (5) MARION 2 N [USC00125337], Marion, IN
- (6) PONTIAC WWTP [USC00206658], Auburn Hills, MI
- (7) MARION 2 N [USC00334942], Marion, OH
- (8) FINDLAY AP [USW00014825], Findlay, OH
- (9) COLUMBIA CITY [USC00121739], Columbia City, IN

- (10) LIMA WWTP [USC00334551], Lima, OH

Influencing water features

This site is a depressional wetland that receives water via precipitation and runoff from surrounding landscapes and draining it to the groundwater system, making it a recharge depression. The soils are very poorly to poorly drained. Drainage and permeability (very slow to moderately rapid) along with landscape position lead much of the site being frequently ponded, most often in the spring and occasionally in the fall. Duration of ponding varies from brief (2 to 7 days) to very long (> 30 days). Ponding depth is has an average maximum of 30 inches.

Wetland description

The hydrogeographic model classification of this site is DEPRESSIONAL: Till Plain, Ponded, Swale; forested. This site has a Cowardin Classification of PFO6An; it is a deciduous forested palustrine system that is temporarily ponded on mineral soil.

Soil features

The soil series associated with this site are: Wolcott, Wetzel, Pewamo, Paulding, Pandora, Mermill, Kokomo, Brookston, Berville, Barry, Alvada. They are deep, very poorly drained to poorly drained, and very slow to moderately rapid permeable soils, with slightly acidic to neutral soil reaction, that formed in ablation till and till from limestone, sandstone, and shale.

Parent Materials Kind: till
Surface Texture: clay, clay loam, loam, sandy loam, silt loam, silty clay, silty clay loam
Surface Modifier: mucky
Subsurface Texture group: loamy

Figure 8. Mapunit locations in MLRA.

Table 4. Representative soil features

Parent material	(1) Till
Surface texture	(1) Clay (2) Clay loam (3) Loam (4) Sandy loam (5) Silt loam (6) Silty clay (7) Silty clay loam
Drainage class	Very poorly drained to poorly drained
Permeability class	Very slow to moderately rapid
Depth to restrictive layer	100 – 110 cm
Surface fragment cover <=3"	Not specified

Surface fragment cover >3"	Not specified
Available water capacity (Depth not specified)	10.41 – 19.05 cm
Calcium carbonate equivalent (Depth not specified)	0 – 20 %
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 – 7.9
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 this ecological site is a flatwood forest. The dominant species in the canopy are pin oak, swamp white oak and cottonwood, with green ash, and silver maple being common as well. The soils of this site are very poorly or poorly drained and characterized by seasonal ponding in the spring and much drier in the summer. This seasonal change in water presence limited seed germination and diversity of shrubs and ground layer species. Fire did occur on the site, but high intensity fires were rare. Low intensity surface fires were more common on sites that are adjacent to more fire prone sites such as prairies and savannas. Ponding in the spring followed by summer drought along with windthrow were the most dominant disturbance factors.

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

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

Other references

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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.

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Composition (Indicators 10 and 12) based on	Annual Production
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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:
