USDA Natural Resources Conservation Service

Ecological site F111XE202OH
Dry Alluvium Floodplain

Last updated: 9/11/2024
Accessed: 05/20/2025

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

111E – Indiana and Ohio Till Plain, Eastern Part. Most of this area is in the Till Plains Section of the Central Lowlands Province of the Interior Plains. The northeast tip of the area is in the Southern New York Section of the Appalachian Highlands. The entire area has been glaciated. It is dominated by ground moraines that are broken in places by kames, lake plains, outwash plains, terraces, and stream valleys. Narrow, shallow valleys commonly are along the few large streams in the area. Elevation ranges from 580 to 1,400 feet (175 to 425 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 plain.

The extent of the major Hydrologic Unit Areas (identified by four-digit numbers) that make up this MLRA is as follows: Scioto (0506), 33 percent; Muskingum (0504), 31 percent; and Western Lake Erie (0410), 28 percent; Upper Ohio (0503), 5 percent; and Southern Lake Erie (0411), 3 percent. The headwaters of many rivers in central Ohio, including the Vermillion, Black Fork, Sandusky, Little Scioto, and Olentangy Rivers, are in this MLRA.

This MLRA is underlain by late Devonian shale and sandstone. Surficial materials include glacial deposits of till, glaciolacustrine sediments, and outwash from Wisconsin and older glacial periods.

Classification relationships

Major Land Resource Area (USDA-Natural Resources Conservation Service, 2006)

USFS Ecological Regions (USDA, 2007):
Sections –Central Till Plains, Beech Maple (222H), Western Glaciated Allegheny Plateau (221F)

Subsections – Allegheny Plateau (221Fa), Bluffton Till Plains (222Ha), Miami-Scioto Plain – Tipton Till Plain (222Hb)

NatureServe Systems anticipated (NatureServe, 2011): Agriculture - Cultivated Crops and Irrigated Agriculture, Agriculture – Pasture/Hay, North-Central Interior Beech-Maple Forest, North-Central Interior Floodplain

LANDFIRE Biophysical Settings anticipated (USGS, 2010): Central Interior and Appalachian Floodplain Systems

Ecological site concept

This site is a wetland/riparian site formed on alluvium parent materials in soils that are moderately well to well drained. These soils generally occur on floodplains, on flat topography, with slopes from 0 to 2 percent. The soil surface color is dark in color (3/2 Munsell or darker) with a silt loam texture.

The characteristic vegetation of the site is a floodplain forest with the understory and canopy dominated by fire sensitive, shade tolerant species most notably Ohio buckeye and red maple, with box elder and tulip tree also being common. Canopy level associates include white oak, basswood, and black walnut. 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 of 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

F111XE201OH	**Wet Alluvium Floodplain** Wet Alluvium Floodplain.Soils are very poorly drained
F111XE203OH	**Wet Alluvium Forest** Wet Alluvium Forest. Soils surface light in color; poorly to somewhat poorly drained

F111XE204OH	**Dry Alluvium Forest** Dry Alluvium Forest. Soils surface light in color; moderately well to well drained

Similar sites

F111XE503OH	**Till Ridge** Till Ridge. Located on glacial till parent material; site is located on a convex landscape position; generally higher on the landscape.
F111XE204OH	**Dry Alluvium Forest** Dry Alluvium Forest. Soils surface light in color; moderately well to well drained

Table 1. Dominant plant species

Tree	(1) *Aesculus glabra* (2) *Acer rubrum*
Shrub	Not specified
Herbaceous	Not specified

Physiographic features

This site is located in the 111E - Indiana and Ohio Till Plain, Eastern 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.

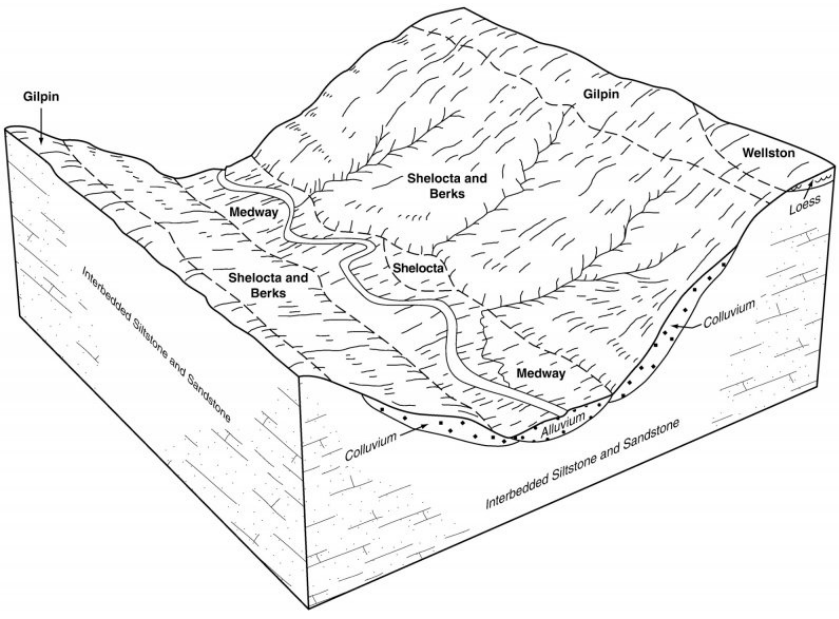

Figure 1. Block diagram showing soils on the landscape.

Table 2. Representative physiographic features

Landforms	(1) Valley > Flood plain
Runoff class	Low to high
Flooding duration	Extremely brief (0.1 to 4 hours) to very brief (4 to 48 hours)
Flooding frequency	Very rare to occasional
Ponding frequency	None
Elevation	244–335 m
Slope	0–2%
Water table depth	69–145 cm
Aspect	Aspect is not a significant factor

Climatic features

The average annual precipitation in this area is 35 to 41 (890 to 1,040 millimeters). Most of the rainfall occurs as convective thunderstorms during the growing season. About half or more of the precipitation occurs during the freeze-free period. Snowfall is common in winter. The average annual temperature is 48 to 52 degrees F (9 to 11 degrees C). The freeze-free period averages about 185 days and ranges from 165 to 205 days.

Table 3. Representative climatic features

Frost-free period (characteristic range)	129-149 days
Freeze-free period (characteristic range)	174-179 days
Precipitation total (characteristic range)	991 mm
Frost-free period (actual range)	126-153 days
Freeze-free period (actual range)	171-185 days
Precipitation total (actual range)	991-1,092 mm
Frost-free period (average)	141 days
Freeze-free period (average)	177 days
Precipitation total (average)	1,016 mm

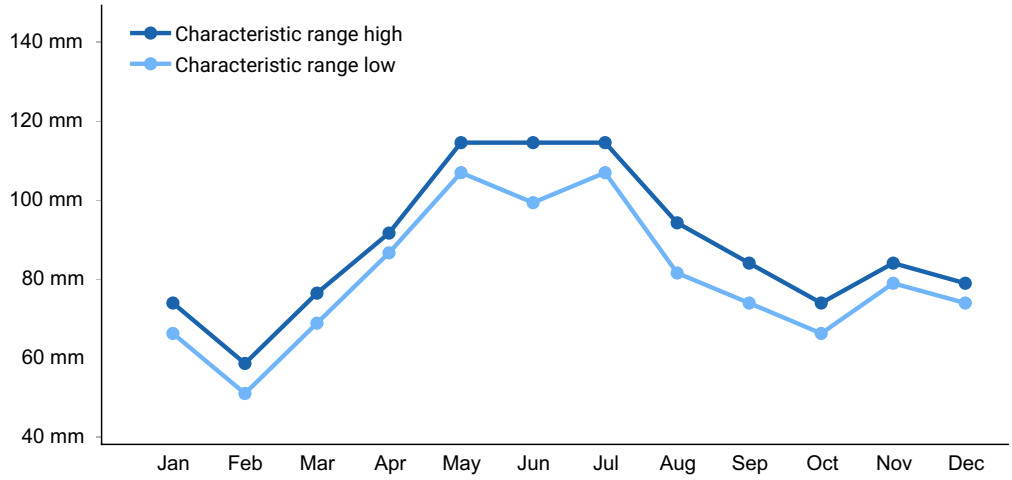

Figure 2. Monthly precipitation range

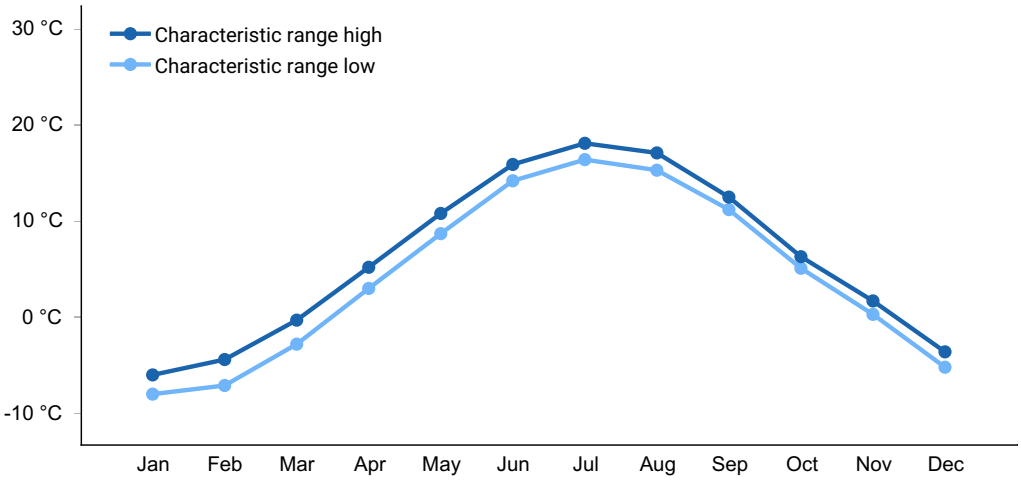

Figure 3. Monthly minimum temperature range

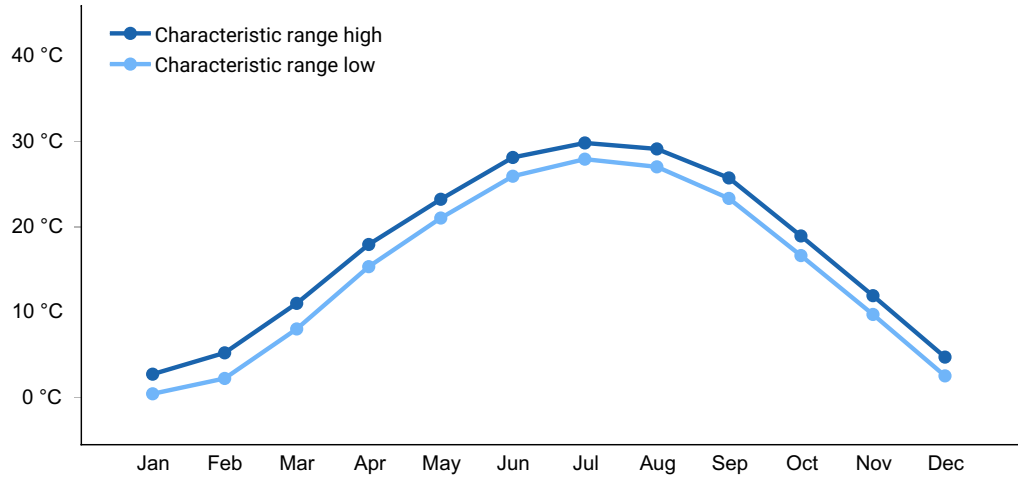

Figure 4. Monthly maximum temperature range

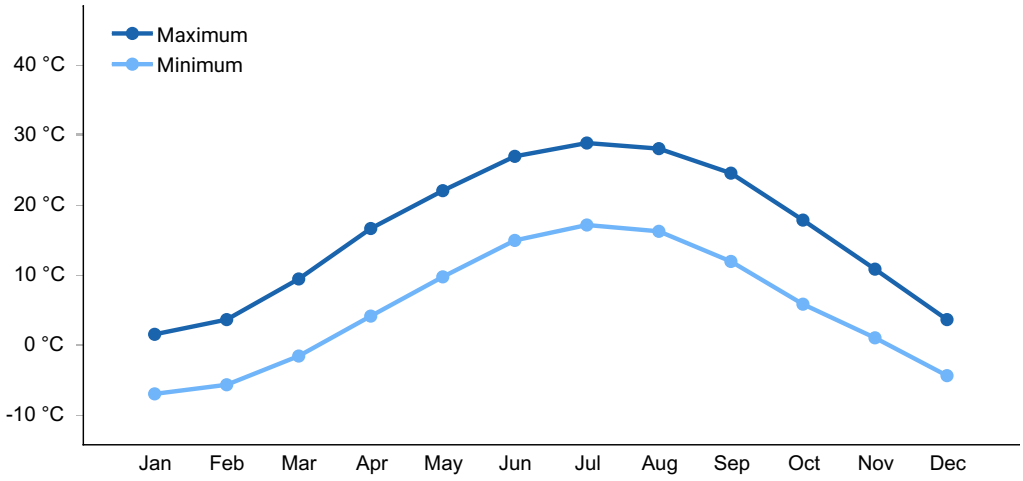

Figure 5. Monthly average minimum and maximum temperature

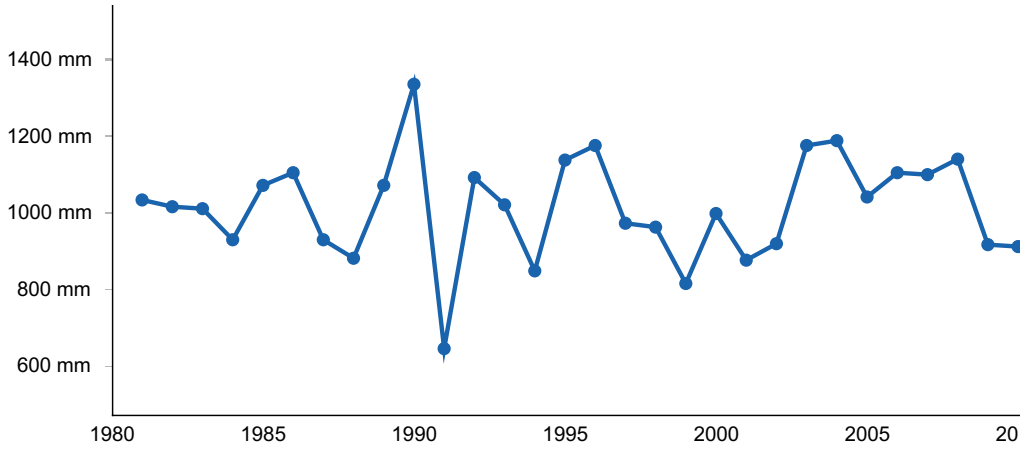

Figure 6. Annual precipitation pattern

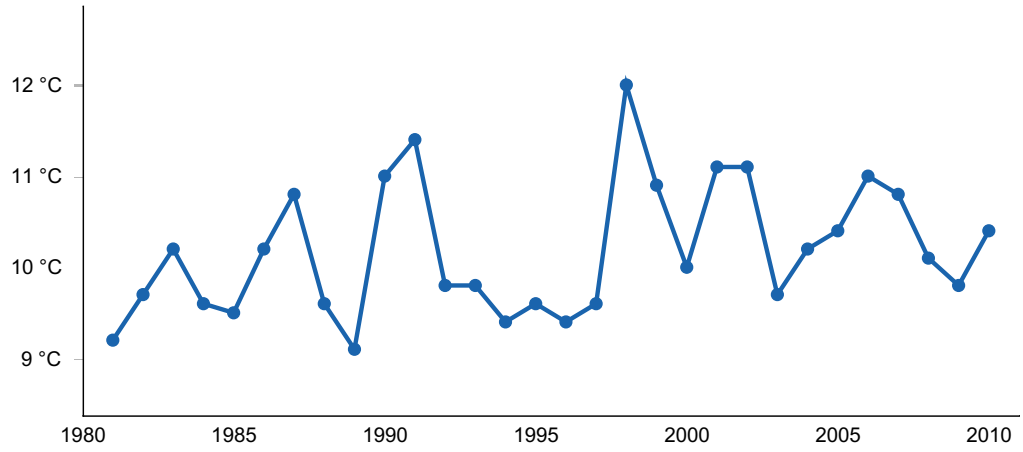

Figure 7. Annual average temperature pattern

Climate stations used

- (1) COLUMBUS PORT COLUMBUS INTL AP [USW00014821], Columbus, OH
- (2) LANCASTER [USC00334403], Lancaster, OH
- (3) CHIPPEWA LAKE [USC00331541], Medina, OH
- (4) MANSFIELD LAHM MUNI AP [USW00014891], Mansfield, OH

- (5) MARION 2 N [USC00334942], Marion, OH
- (6) WESTERVILLE [USC00338951], Westerville, OH
- (7) BUCYRUS [USC00331072], Bucyrus, OH

Influencing water features

This site is characterized by its location in a floodplain of a perennial stream and there is most affected by the flooding, scouring, and channel movement of the adjacent lotic system. Flooding can be very rare to occasional with a very brief (4 to 48 hour) duration depending on the riverine system. Ponding does not occur on the site largely due to drainage and coarseness of soil, but also due to landform position. 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 during the summer. Levees, dams, and channelization have greatly altered the hydrology and flooding of the riparian systems in many places.

The hydrogeographic model classification for this site is RIVERINE: Alluvial Plain, Backswamp, 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: Rossburg and Medway. They are very deep, moderately well drained to well drained, and moderate permeable soils, with neutral soil reaction, that formed in alluvium.

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

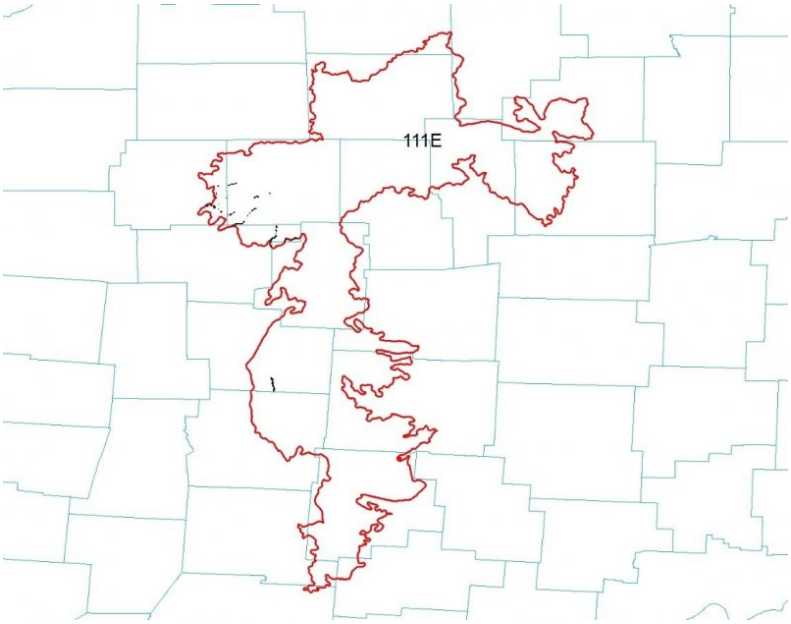

Figure 8. location of mapunits within the MLRA

Table 4. Representative soil features

Parent material	(1) Alluvium
Surface texture	(1) Silt loam
Drainage class	Moderately well drained to well drained
Permeability class	Moderate
Soil depth	203 cm
Surface fragment cover <=3"	0%
Surface fragment cover >3"	0%
Available water capacity (Depth not specified)	17.27–20.57 cm
Calcium carbonate equivalent (Depth not specified)	0–3%
Electrical conductivity (Depth not specified)	0 mmhos/cm
Sodium adsorption ratio (Depth not specified)	0
Soil reaction (1:1 water) (Depth not specified)	7–7.3
Subsurface fragment volume <=3" (Depth not specified)	2–6%
Subsurface fragment volume >3" (Depth not specified)	0%

Ecological dynamics

The historic plant community of the Dry Alluvium Floodplain ecological site is a dry floodplain forest. The dominant species in the canopy are Ohio buckeye and red maple with box elder and tulip-tree 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

Dry Alluvium Floodplain, F111EY202OH

Diagram Legend

T1A	Establishment, no management
T1B	Remove woody species, drainage, site preparation, planting, management
T2A	Chemical/mechanical treatment of invasive species
T2B	Remove woody species, drainage, site preparation, planting, management
T3A	Drainage removal, planting, TSI management
1.1A	Succession
1.2A	Disturbance that removes trees
3.1A	Pasture/forage planting and maintenance
3.2A	Tillage/no-till planting and management of row crops.

Figure 9. Legend

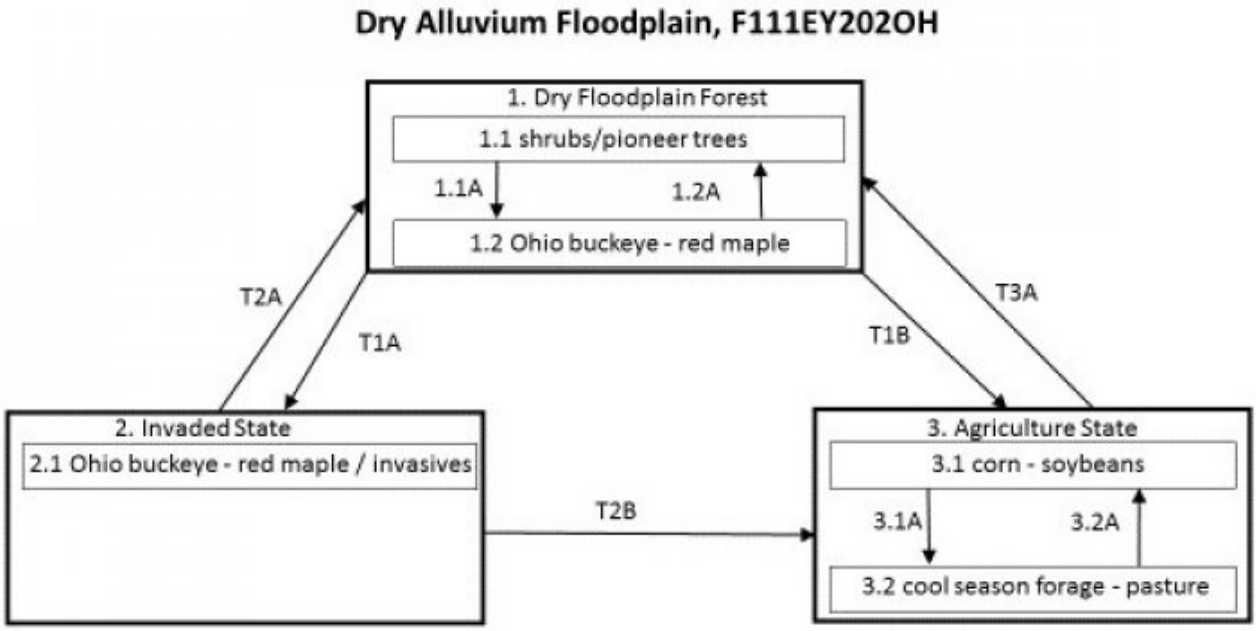

Figure 10. STM

State 1
Dry Floodplain Forest

This is the reference or diagnostic plant community for this site. In reference condition (mature), this site was dominated by Ohio buckeye and red maple trees. Other canopy

tree species include box elder, tulip tree, white oak, basswood, and black walnut. An earlier successional phase of this site is comprised largely of young Ohio buckeyes, box elders, red maples, dogwoods and pawpaw along with herbaceous species. Prior to settlement, the dynamics of the site were largely controlled by flooding, channel meandering, sedimentation and erosion. These process still occur, at some level, yet to this day, but have been greatly altered from pre-settlement conditions by bank stabilization, dams, diversions, and channel straightening.

Dominant plant species

- Ohio buckeye (*Aesculus glabra*), tree
- red maple (*Acer rubrum*), tree

Community 1.1
shrubs / pioneer trees

This phase is characterized by pioneering woody species. Most common and numerous are willow species, cottonwoods, and dogwoods. This is the early successional phase after a large disturbance even on the vegetating of a new bank or island of the riparian area. Cover is generally very heavy, but usually not more than 10 feet tall. As time and succession progress, the trees become bigger but fewer.

Dominant plant species

- cottonwood (*Populus*), tree
- dogwood (*Cornus*), tree
- willow (*Salix*), shrub

Community 1.2
ohio buckeye - red maple

This phase is characterized by tree species dominance, particularly Ohio buckeye and red maple. Additional canopy species include box elder, tulip tree, white oak, basswood, and black walnut. Under story woody species include hornbeam, spicebush, and eastern redbud.

Dominant plant species

- Ohio buckeye (*Aesculus glabra*), tree
- red maple (*Acer rubrum*), tree
- hophornbeam (*Ostrya*), shrub
- northern spicebush (*Lindera benzoin*), shrub

Pathway P1.1A
Community 1.1 to 1.2

Time and succession will move the site from this phase to the full expression of the floodplain forest.

Pathway P1.2A
Community 1.2 to 1.1

Disturbance, whether natural or as management, that removes a large portion of the trees will move the site towards phase 1.1.

State 2
Invaded States

This state is characterized by the establishment and eventual dominance of invasive species in the understory. This greatly reduces the species richness and diversity of the site as a whole. Common invasive species for this site include, but are not limited to, species of Asian bush honeysuckle, Callery pear, autumn olive and ailanthus.

Dominant plant species

- maple (*Acer*), tree
- honeysuckle (*Lonicera*), shrub
- autumn olive (*Elaeagnus umbellata*), shrub

Community 2.1
invaded community

This phase is characterized by the understory being dominated by woody, mostly non-native, invasive species.

Dominant plant species

- tree of heaven (*Ailanthus altissima*), tree
- Callery pear (*Pyrus calleryana*), tree
- maple (*Acer*), tree
- honeysuckle (*Lonicera*), shrub
- autumn olive (*Elaeagnus umbellata*), shrub

State 3
Agricultural

This state is characterized by the conversion of the site to agricultural use. Most common practice is a corn and soybean rotation of various types. A portion of the historic acres are used for forage and pasture.

Community 3.1

corn - soybeans

This phase is characterized by row crop agriculture of small grains, primarily corn and soybeans.

Community 3.2
pasture - forage

This phase is characterized by forage or grazing agriculture. Different mixes of, generally, cool season grasses and forbs, largely clovers, are grown.

Pathway P3.1A
Community 3.1 to 3.2

This phase is characterized by row crop agriculture of small grains, primarily corn and soybeans.

Pathway P3.2A
Community 3.2 to 3.1

Planting, either by conventional or no-till methods, of row crops. Management that keeps the site in row crop production

Transition T1A
State 1 to 2

The establishment of an invasive species without management to remove or control it will transition the site to the Invaded State (2).

Transition T1B
State 1 to 3

Removal of the trees and the installation of a drainage system are the first steps in converting the site to the Agriculture State (3). Regular agricultural practices will maintain the site in that state.

Restoration pathway R2A
State 2 to 1

Chemical and mechanical treatment of the invasive species. Planting of desired species may be needed if they are not enough left to recolonize the site.

Transition T2B
State 2 to 3

Removal of trees and other woody species. Install drainage system, prepare the site for planting the agricultural crop, and regular agricultural practices.

Restoration pathway R3A
State 3 to 1

Chemical and mechanical treatment of the invasive species. Planting of desired species may be needed if they are not enough left to recolonize the site.

Additional community tables

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.

Author(s)/participant(s)	TYLER STAGGS
Contact for lead author	
Date	02/07/2022
Approved by	Greg Schmidt
Approval date	
Composition (Indicators 10 and 12) based on	Annual Production

Indicators

1. **Number and extent of rills:**

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2. **Presence of water flow patterns:**

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3. **Number and height of erosional pedestals or terracettes:**

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

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5. **Number of gullies and erosion associated with gullies:**

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

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

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

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

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

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

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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:

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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:**
