

Ecological site F111XC014IN Wet Floodplain

Accessed: 05/03/2024

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

A PROVISIONAL ECOLOGICAL SITE is a conceptual grouping of soil map unit components within a Major Land Resource Area (MLRA) based on the similarities in response to management. Although there may be wide variability in the productivity of the soils grouped into a Provisional Site, the soil vegetation interactions as expressed in the State and Transition Model are similar and the management actions required to achieve objectives, whether maintaining the existing ecological state or managing for an alternative state, are similar. Provisional Sites are likely to be refined into more precise group during the process of meeting the APPROVED ECOLOGICAL SITE DESCRIPTION criteria.

This PROVISIONAL ECOLOGICAL SITE has been developed to meet the standards established in the National Ecological Site Handbook. The information associated with this ecological site does not meet the Approved Ecological Site Description Standard, but it has been through a Quality Control and Quality Assurance processes to assure consistency and completeness. Further investigations, reviews and correlations are necessary before it becomes an Approved Ecological Site Description.

111C – Indiana and Ohio Till Plain, Northwestern Part. This MLRA is in the glaciated part of north-central Indiana and is dominated by glacial till plains broken in places by lake plains, outwash plains, and flood plains. Areas that parallel most of the major rivers and streams have deposits of sand.

Although it is an important agricultural region, MLRA 111C hosts a large proportion of Indiana's biodiversity.

Classification relationships

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

USFS Ecological Regions (USDA, 2007):

Sections - Central Till Plains, Beech Maple (222H), South Central Great Lakes (222J), Central Till Plains and Grand Prairies (251D)

Subsections - Kalamazoo-Elkhart Moraines and Plains (222Jh), Steuben Interlobate Moraines (222Ji), Bluffton Till Plains (222Ha), Entrenched Valleys (222Hf), Miami-Scioto Plain-Tipton Till Plain (222Hb), Kankakee Sands (251Dg) and Eastern Grand Prairie (251Dd).

NatureServe Systems anticipated (NatureServe, 2011): Agriculture-Pasture/Hay, Agriculture-Cultivated Crops and Irrigated Agriculture, Harvested Forest-Grass Regeneration, Harvested Forest-Herbaceous Regeneration, Introduced Upland Vegetation – Treed, North-Central Interior Dry-Mesic Oak Forest & Woodland, North-Central Interior Floodplain, North-Central Interior Wet Flatwoods, Ruderal Forest, Ruderal Upland-Old Field, South-Central Interior Large Floodplain.

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

North-Central Interior Dry-Mesic Oak Forest and Woodland, North-Central Interior Beech-Maple Forest, Central Interior and Appalachian Floodplain Systems, North Central Wet Flatwoods, North-Central Interior Maple-Basswood Forest, Laurentian-Acadian Floodplain Systems.

Ecological site concept

This site is a riparian site formed on alluvial parent materials that are somewhat poorly drained or wetter. It is located along the floodplain of lotic systems in loamy alluvial deposits often overlaying coarser materials. Active hydrologic and geomorphic process, along with windthrow of established trees, drive the long interval disturbance regime of this site. There are 3 distinct states; 1. floodplain forest, 2. invaded state, and 3. agriculture state. Currently, just under half of this site is in agriculture production with the remaining being naturally regenerated vegetation.

Associated sites

F111XC015IN	Dry Floodplain Located on terraces on floodplain and better drained.
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Similar sites

F111XC015IN	Dry Floodplain Located on terraces on floodplain and better drained.
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Table 1. Dominant plant species

Tree	(1) <i>Populus deltoides</i> (2) <i>Platanus occidentalis</i>
Shrub	(1) <i>Asimina triloba</i>
Herbaceous	Not specified

Physiographic features

This site is located in the 111C - Indiana and Ohio Till Plain, Northwestern Part MLRA. It is classified as a wetland/riparian site. This site was formed in loamy alluvium in the floodplains of streams and rivers. This creates a long, linear expression of the site on the landscape.

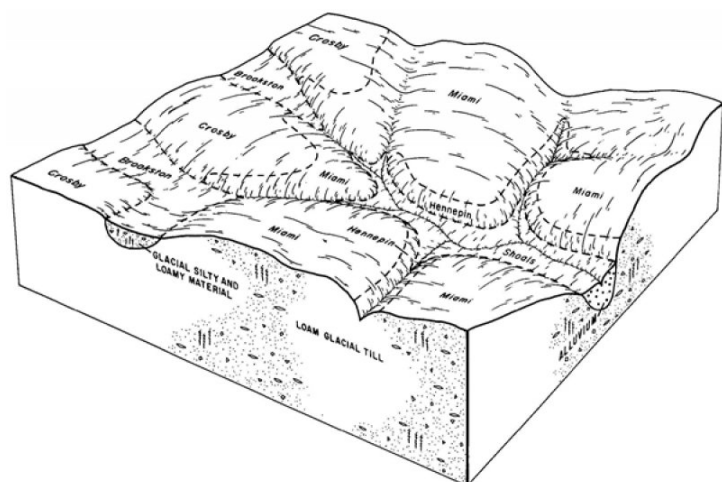


Figure 1. Shoals represents position on landscape

Table 2. Representative physiographic features

Landforms	(1) Flood plain
Flooding duration	Brief (2 to 7 days) to very long (more than 30 days)

Flooding frequency	Frequent to very frequent
Slope	0–1%
Water table depth	15–61 cm
Aspect	Aspect is not a significant factor

Climatic features

The climate is humid continental in nature typified by large season temperature differences, with warm to hot, humid summers and cold winters. Precipitation is relatively well distributed year-round.

Table 3. Representative climatic features

Frost-free period (average)	163 days
Freeze-free period (average)	191 days
Precipitation total (average)	1,041 mm

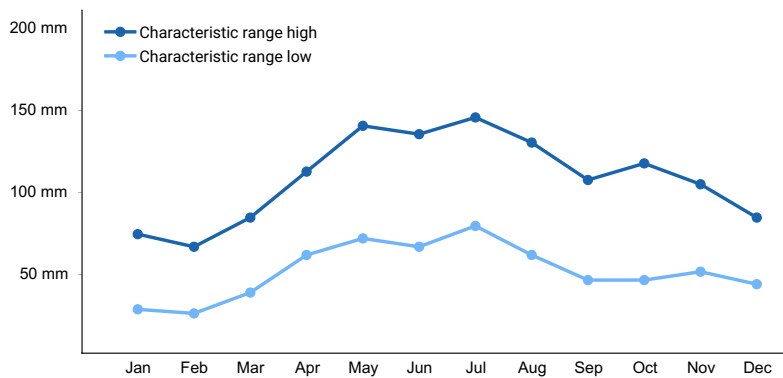


Figure 2. Monthly precipitation range

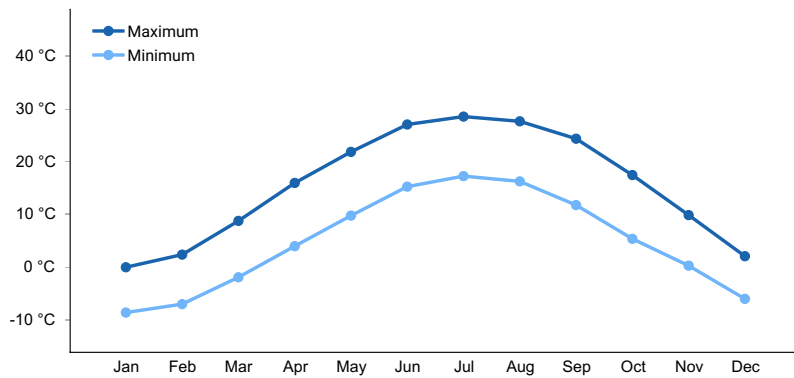


Figure 3. Monthly average minimum and maximum temperature

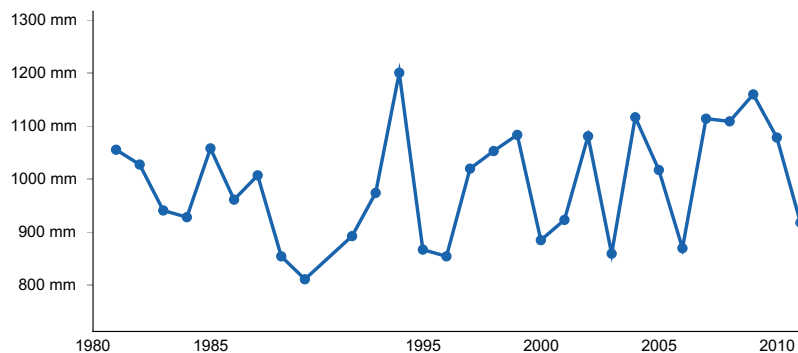


Figure 4. Annual precipitation pattern

Climate stations used

- (1) CHALMERS 5 W [USC00121417], Chalmers, IN
- (2) GOSHEN 3SW [USC00123418], Goshen, IN
- (3) WARSAW [USC00129240], Warsaw, IN
- (4) WINAMAC 2SSE [USC00129670], Winamac, IN
- (5) RENSSELAER [USC00127298], Rensselaer, IN
- (6) PLYMOUTH [USC00126989], Plymouth, IN

Influencing water features

This site is characterized by its location in a floodplain and there is most affected by the flooding, scouring, and channel movement of the adjacent lotic system.

Soil features

In a representative profile for the Wet Floodplain ecological site, the soils of this site are grayish brown, very deep loams. The loamy alluvial surface material often overlays a much coarser material further down the profile. The components Shoals and Waterford are common soils found on this site.

Table 4. Representative soil features

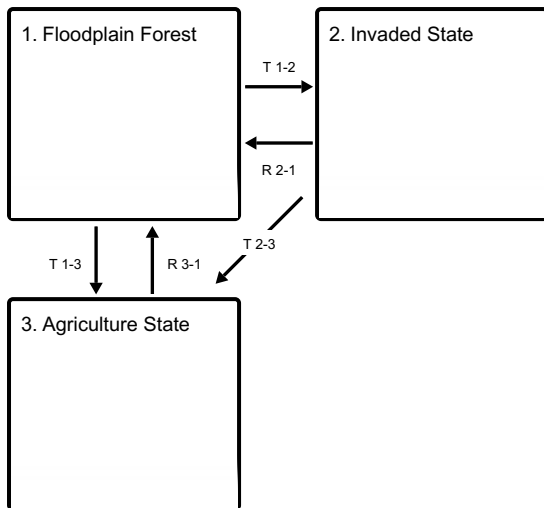
Surface texture	(1) Loam
Family particle size	(1) Sandy
Drainage class	Very poorly drained to somewhat poorly drained
Permeability class	Moderate to moderately rapid
Soil depth	79–114 cm
Surface fragment cover <=3"	0–7%
Subsurface fragment volume <=3" (Depth not specified)	0–14%

Ecological dynamics

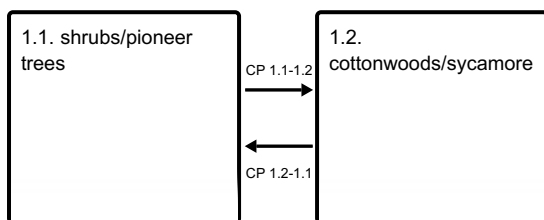
The historic plant community of the Wet Floodplain ecological site is a floodplain forest. The dominant species in the canopy are cottonwood and sycamore, with silver maple, swamp white oak, and walnut being common as well. This site is the result of hydrologic and geomorphic process at the macro scale and windthrow on a more local scale. The disturbance regime is one of frequent low intensity flooding events that do not greatly effect the dominant species often. This is punctuated by high intensity events (ie. 100+ year floods, tornados, or ice storms) that remove the dominate species. Succession starts with a shrub dominated community that is a mix of pioneering species such as willows and herbaceous species. Since settlement, just under 50% of this site is in agriculture production. The balance being largely a mix of the reference state and the invaded state.

State and transition model

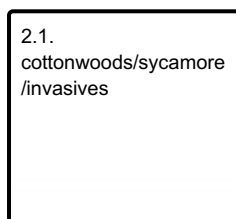
Ecosystem states



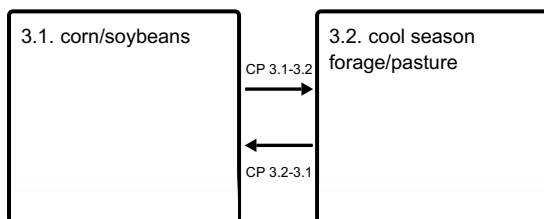
State 1 submodel, plant communities



State 2 submodel, plant communities



State 3 submodel, plant communities



State 1 Floodplain Forest

This is the reference or diagnostic plant community for this site. In reference condition (mature), this site was dominated by cottonwood and sycamore trees. Other canopy tree species include silver maple, swamp white oak, and black walnut. An earlier successional phase of this site is comprised largely of young cottonwoods, willows, 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. Nearly one-half of this site is in agricultural production, most of which is used to grow corn and soybeans. Many of the areas that are relatively intact have been affected by invasive species and the disruption of the hydrologic and geomorphic processes listed above.

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.

Community 1.2 cottonwoods/sycamore

This phase is characterized by tree species dominance, particularly cottonwood and sycamores. Additional canopy species include black walnut, silver maple, and swamp white oak. Understory woody species include dogwoods, spicebush, and paw-paw.

Pathway CP 1.1-1.2 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 CP 1.2-1.1 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 State

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 invasives for this site include, but are not limited to, species of Asian bush honeysuckle, Callery pear, autumn olive and ailanthus.

Community 2.1 cottonwoods/sycamore/invasives

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

State 3 Agriculture State

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. About 10% of the historic acres are use 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 cool season forage/pasture

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

Pathway CP 3.1-3.2 Community 3.1 to 3.2

Planting of cool season pasture/forage species and management to maintain them.

Pathway CP 3.2-3.1

Community 3.2 to 3.1

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

Transition T 1-2

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 T 1-3

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. Regular agricultural practices will maintain the site in that state.

Restoration pathway R 2-1

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 T 2-3

State 2 to 3

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

Restoration pathway R 3-1

State 3 to 1

Removal of drainage system, site preparation, and tree planting.

Additional community tables

Inventory data references

Site concept developed through expert opinion, review of the literature, and field work. Field work has included reconnaissance, qualitative data collection, and soil pedon description.

Other references

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Contributors

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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)	
Contact for lead author	
Date	
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:
