

## **Ecological site F120CY015IN Loamy Alluvial Headwaters**

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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): 120C—Kentucky and Indiana Sandstone and Shale Hills and Valleys, Northeastern Part

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This area is entirely in Indiana and makes up about 1,050 square miles (2,725 square kilometers). Physiography: This area is in the Highland Rim Section of the Interior Low Plateaus Province of the Interior Plains. Both large and small tributaries of the Ohio River and the East Fork of the White River dissect the nearly level to very steep uplands in the 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. Summits are narrow and are nearly level to gently sloping. Geology: The geologic materials in this area are of Early and Middle Pennsylvanian and Late Mississippian age. The rocks consist mainly of flat-lying, interbedded sandstone, shale, coal, and siltstone with minor areas of limestone. Bedrock outcrops are common on the bluffs along the Ohio River and its major tributaries. The surficial geologic materials consist mainly of a layer of loess, typically less than 3.5 feet (1 meter) thick, on the less eroded parts of the landscape and stratified sediments of Pleistocene age along the Ohio River and its tributaries. Unconsolidated alluvium is deposited in the river valleys.

Soils: The dominant soil orders in this MLRA are Alfisols, Ultisols, and Inceptisols. The soils in the area have a mesic soil temperature regime, an udic or aquic soil moisture regime, and dominantly mixed mineralogy. They formed dominantly in loess and in residuum derived from siltstone and shale. They range from moderately deep to very deep and from somewhat poorly drained to well drained and are loamy, silty, or clayey. Fragiudults (Spickert and Tilsit series) and Hapludults (Wrays series) are the dominant soils on ridgetops and the upper parts of hills and knobs. Halpudalfs (Kurtz series), Hapludults (Gilwood and Gnowbone series), and Dystrudepts (Brownstown series) are on moderately sloping to very steep side slopes. Hapludalfs (Coolville, Rarden, Stonehead, and Wellrock series) are on the gently sloping to moderately steep lower parts of side slopes. Hapludalfs (Elkinsville series), Fragiudalfs (Pekin series), and Fragiqualfs (Bartle series) are on stream terraces. Dystrudepts (Beanblossom, Cuba, and Steff series) and Endoaquepts (Stendal series) are on flood plains.

### **Classification relationships**

South Central Interior Small Stream and Riparian CES202.706

USNVC HIERARCHY: FAGUS GRANDIFOLIA - ACER SACCHARUM - (LIRIODENDRON TULIPIFERA) FOREST ALLIANCE (I.B.2.N.a)

### **Ecological site concept**

The communities described in this provisional document reflect plant communities that are likely to be found on these soils and have not been field verified. This PES describes hypotheses based on available data of many different scales and sources and has not been developed utilizing site-specific ecological field monitoring. This PES does not encompass the entire complexity or diversity of these sites. Field studies would be required to develop a comprehensive and science-based restoration plan for these sites.

The hypotheses below were developed utilizing data from many sources including NASIS, USDA official soil descriptions (OSDs), Vegbank.org, NatureServe Explorer, INDR information, and Purdue University data for the Hoosier National Forest (Andriy Vladimirovich Zhalnin and George R. Parker, 2007, Delineation and spatial analysis of ecological classification units for the Hoosier National Forest in Southern Indiana)

#### Forest:

State 1, Phase 1.1. American beech (*Fagus grandifolia*) – tulip poplar (*Liriodendron tulipifera*) / northern spicebush (*Lindera benzoin*)- paw paw (*Asimina triloba*) / Jack in the pulpit (*Arisaema triphyllum*)- violet (*Viola* spp.)

Dominant overstory trees and common associates for this community include American beech, sugar maple, tulip poplar, white ash, and white oak. Common sampling age trees would be sugar maple, beech, blackgum, white ash, and red elm.

The small tree and shrub layer includes paw-paw, spicebush, flowering dogwood, ironwood, redbud, and ironwood (blue-beech). Devil's walking stick, winged elm and shining sumac may also occur.

Herbaceous plants may include the following: agrimony (*Agrimonia* spp.), white baneberry (*Actaea pachypoda*), hogpeanut (*Amphicarpaea bracteata*), wild ginger (*Asarum canadense*), sedges (*Carex* spp.), spring beauty (*Claytonia virginica*), toothwort (*Dentaria* spp.), mayapple (*Podophyllum peltatum*), snakeroot (*Sanicula* spp.), and violets (*Viola* spp.).

#### Pasture:

State 2, Phase 2.1. *Schedonorus arundinaceus* (tall fescue). Species present are dependent upon seeding and management.

#### Transitional (Abandoned Field)

State: 3. Phase 3.1. maple (*Acer* spp.) / berries (*Rubus* spp.)/ fescue (*Schedonorus arundinaceus*)

This phase is best described as an old field habitat with a mixture of native and introduced grasses and a variety of native and non-native herbs, forbs, seedlings, and saplings. Species will depend on seed sources and ongoing disturbance levels.

#### Abandoned Cropland

State 4, Phase 4.1. henbit deadnettle (*Lamium amplexicaule*) – mouse-eared chickweed (*Cerastium* L.)

Abandonment of cropland would result in many weed species taking over the site. Initially, annual weeds would be predominate followed by grasses, shrubs and pioneers trees.

#### Cropland.

State 5, Phase 5.1. Plant species dominants: dependent upon seeding and management.

Most common crops are corn and soybeans.

Restoration of states 2-5 to the reference community would require long-term, intensive management inputs.

**Table 1. Dominant plant species**

Tree	(1) <i>Fagus grandifolia</i> (2) <i>Liriodendron tulipifera</i>
Shrub	(1) <i>Lindera benzoin</i> (2) <i>Asimina triloba</i>
Herbaceous	(1) <i>Arisaema triphyllum</i> (2) <i>Viola</i>

## Physiographic features

These alluvial soils are well drained, deep to very deep, and found in floodplains.

**Table 2. Representative physiographic features**

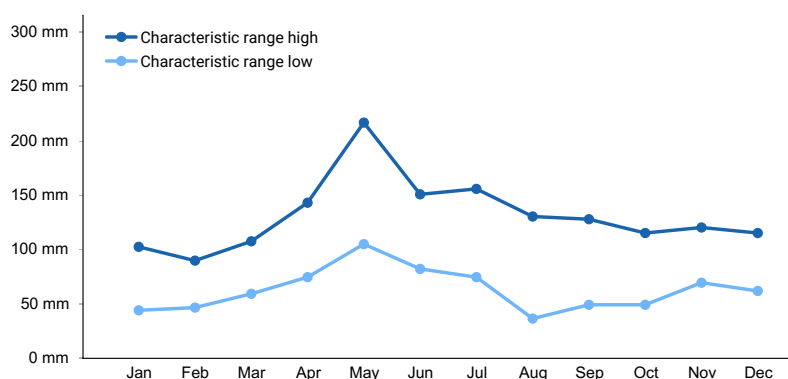
Landforms	(1) Flood plain
Flooding duration	Very brief (4 to 48 hours) to brief (2 to 7 days)
Flooding frequency	Very rare to frequent
Ponding frequency	None
Elevation	122–244 m
Slope	0–2%
Water table depth	102–152 cm
Aspect	Aspect is not a significant factor

## Climatic features

Climate: The average annual precipitation in most of this area is 41 to 47 inches (1,040 to 1,195 millimeters). About 60 percent of the precipitation falls during the freeze-free period. Most of the rainfall occurs as high-intensity, convective thunderstorms in summer. Snowfall is common in winter. The average annual temperature is 52 to 56 degrees F (11 to 14 degrees C). The freeze-free period averages 205 days and ranges from 190 to 220 days. The longer freeze-free periods occur along the Ohio River. (Land Resource Regions and Major Land Resource Areas of the United States, the Caribbean, and the Pacific Basin. United States Department of Agriculture. Natural Resources Conservation Service. United States Department of Agriculture Handbook 296. Issued 2006.)

**Table 3. Representative climatic features**

Frost-free period (average)	175 days
Freeze-free period (average)	205 days
Precipitation total (average)	1,194 mm



**Figure 1. Monthly precipitation range**

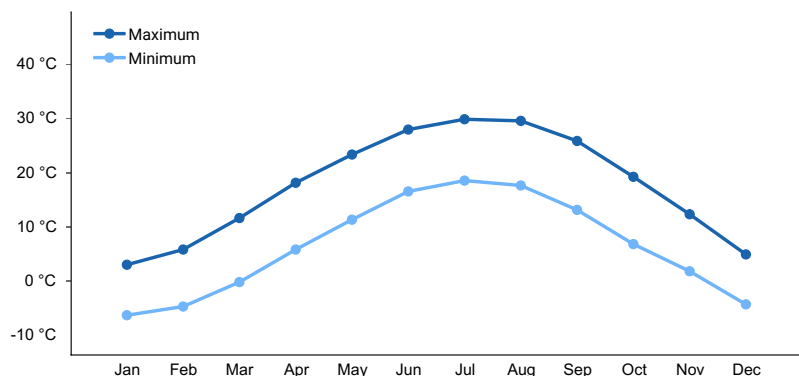


Figure 2. Monthly average minimum and maximum temperature

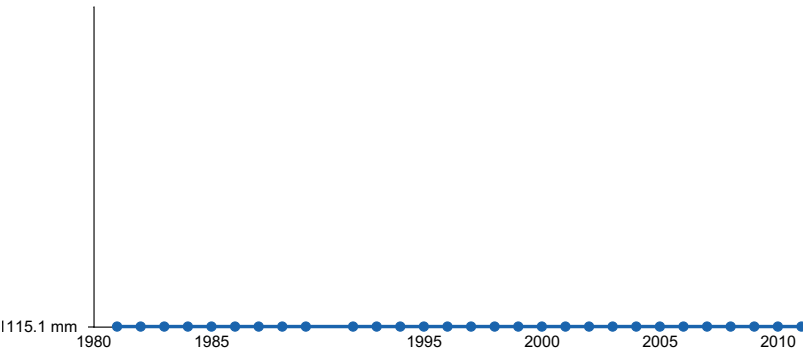


Figure 3. Annual precipitation pattern

### Climate stations used

- (1) BLOOMINGTON IN UNIV [USC00120784], Bloomington, IN

### Influencing water features

These sites may be influenced by periodic flooding as they are located in the headwaters.

### Soil features

Soils in this group are located in the headwaters of floodplains and are formed in alluvium. Series included are Beanblossom, Burnside, and Wirt.

The Beanblossom series consists of deep, well drained soils that formed in 0 to 24 inches of medium-textured alluvium and the underlying loamy-skeletal alluvium. These soils are on flood plains and alluvial fans. Slope ranges from 1 to 3 percent.

The Burnside series consists of deep, well drained soils that formed in 30 to 61 centimeters (12 to 24 inches) of medium-textured alluvium and the underlying loamy-skeletal alluvium. These soils are on flood plains and alluvial fans. Slope ranges from 0 to 4 percent.

The Wirt series consists of very deep, well drained soils that formed in loamy alluvium. These soils are on flood plains and flood-plain steps. Slope ranges from 0 to 2 percent.

Table 4. Representative soil features

Surface texture	(1) Silt loam (2) Silty clay loam (3) Loam
Family particle size	(1) Loamy

Drainage class	Well drained
Soil depth	152–203 cm
Surface fragment cover <=3"	0%
Surface fragment cover >3"	0%
Available water capacity (0-101.6cm)	12.7–18.54 cm
Soil reaction (1:1 water) (0-101.6cm)	5–7
Subsurface fragment volume <=3" (Depth not specified)	0–15%
Subsurface fragment volume >3" (Depth not specified)	0–50%

## Ecological dynamics

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## **State and transition model**

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Vegbank: [www.vegbank.org](http://www.vegbank.org)

Wildland Fire Management RD&A: <https://www.frames.gov/partner-sites/wfmrda-ffe/home/>

Web Soil Survey, USDA-NRCS: <http://websoilsurvey.nrcs.usda.gov/app/>

## 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:**

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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:**
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