

Ecological site F140XY013PA High Floodplain

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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): 140X—Glaciated Allegheny Plateau and Catskill Mountains

This area is primarily in the Southern New York Section of the Appalachian Plateaus Province of the Appalachian Highlands. The top of the dissected plateau in this MLRA is broad and is nearly level to moderately sloping. The narrow valleys have steep walls and smooth floors. The Catskills in the east have steep slopes. Elevation is typically 650 to 1,000 feet on valley floors; 1,650 to 2,000 feet on the plateau surface; and 3,600 feet or more in parts of the Catskills.

The average annual precipitation in most of this area is 30 to 45 inches. Rainfall occurs as high-intensity, convective thunderstorms during the summer, but most of the precipitation in this area occurs as snow. The average annual temperature is 40 to 50 degrees F.

The dominant soil order in this MLRA is Inceptisols. The soils in the area dominantly have a mesic soil temperature regime, an aquic or udic soil moisture regime, and mixed mineralogy. Frigid soils are found within the higher elevations.

This area supports forest vegetation, particularly hardwood species. Beech-birch-maple and elm-ash-red maple are the potential forest types. The extent of oak species increases from east to west, particularly in areas of shallow and dry soils. In some areas conifers, such as white pine, are important. Aspen, hemlock, northern white-cedar, and black ash grow on the wetter soils. In some parts of the area, sugar maple has potential economic significance. Some of the major wildlife species in this area are white-tailed deer, cottontail, turkey, pheasant, and grouse.

Classification relationships

USDA NRCS:

LRR: R - Northeastern Forage and Forest Region

MLRA 140 - Glaciated Allegheny Plateau and Catskills Mountains

NY Natural Heritage Program Plant Community Classification:

Floodplain Forest

PA Natural Heritage Program Plant Community Classification:

Sugar Maple – Mixed Hardwood Floodplain Forest

International Vegetation Classification Associations:

Terrace Hardwood Floodplain Forest (CEGL006114)

NatureServe Ecological Systems

Central Appalachian River Floodplain (CES202.608)

Ecological site concept

Landform/Landscape Position:

The site occurs on floodplains. Slopes range from 0 to 3 percent.

Soils:

The soils consists of very deep, well drained, and coarse-loamy soils formed in recent alluvium. Subsurface rock fragments range up to 35% by volume. Representative soils are Barbour, Delaware, Hamplain, Tioga, Trestle, and Wenonah.

Vegetation:

The reference community is identified as a Sugar Maple - Mixed Hardwood Floodplain Forest (PA Natural Heritage Program). Characteristic vegetation includes:

Trees: Sugar maple (*Acer saccharum*), white ash (*Fraxinus americana*), Sycamore (*Platanus occidentalis*), basswood (*Tilia americana*), bitternut hickory (*Carya cordiformis*), American beech (*Fagus grandifolia*)

Shrubs: Spicebush (*Lindera benzoin*), Arrow-wood (*Viburnum dentatum*), Elderberry (*Sambucus nigra*)

Herbaceous: ostrich fern (*Matteuccia struthiopteris*), clearweed, (*Pilea pumila*), white snakeroot (*Ageratina altissima*), wood-nettle (*Laportea canadensis*), false nettle (*Boehmeria cylindrica*)

Bryophytes: Sphagnum spp.

Table 1. Dominant plant species

Tree	(1) <i>Acer saccharum</i> (2) <i>Fraxinus americana</i>
Shrub	(1) <i>Lindera benzoin</i> (2) <i>Viburnum dentatum</i>
Herbaceous	(1) <i>Matteuccia struthiopteris</i> (2) <i>Pilea pumila</i>

Physiographic features

The site occurs on floodplains. Slopes are mostly under 8 percent but can range up to 20 percent

Table 2. Representative physiographic features

Landforms	(1) Flood plain
Runoff class	Very low to low
Flooding frequency	Rare to occasional
Ponding frequency	None
Slope	0–8%
Aspect	Aspect is not a significant factor

Table 3. Representative physiographic features (actual ranges)

Runoff class	Not specified
Flooding frequency	Not specified
Ponding frequency	Not specified
Slope	0–20%

Climatic features

Mean annual precipitation is 43 inches and evenly distributed throughout the year. Most of the rainfall occurs as high intensity, convective thunderstorms during the summer. Snowfall is common from late in autumn to early spring. Average frost-free and freeze-free days are 122 and 153, respectively.

Table 4. Representative climatic features

Frost-free period (characteristic range)	110-134 days
Freeze-free period (characteristic range)	136-168 days
Precipitation total (characteristic range)	965-1,245 mm
Frost-free period (actual range)	101-136 days
Freeze-free period (actual range)	136-168 days
Precipitation total (actual range)	914-1,295 mm
Frost-free period (average)	122 days
Freeze-free period (average)	154 days
Precipitation total (average)	1,092 mm

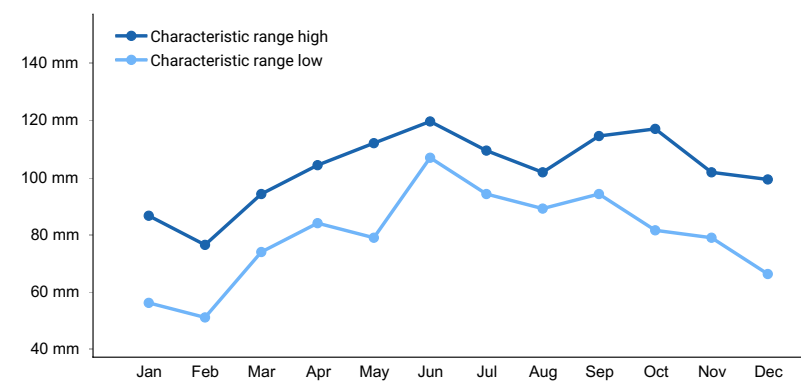


Figure 1. Monthly precipitation range

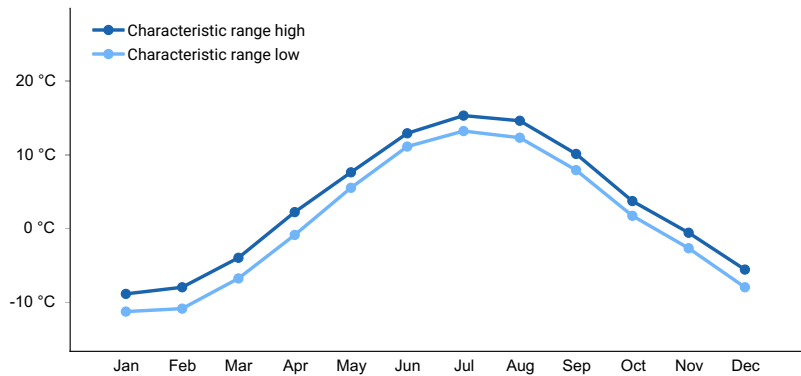


Figure 2. Monthly minimum temperature range

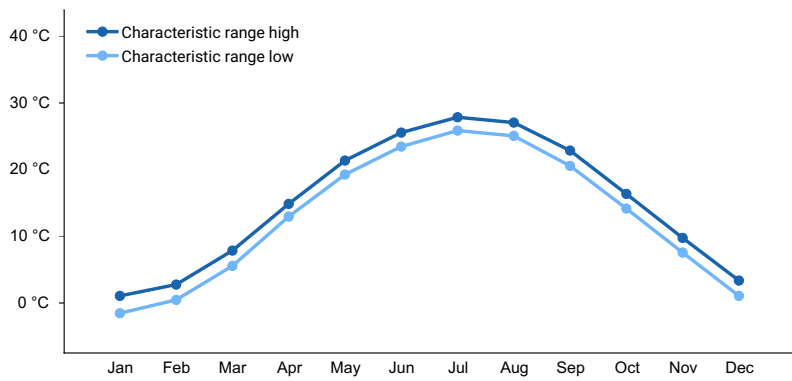


Figure 3. Monthly maximum temperature range

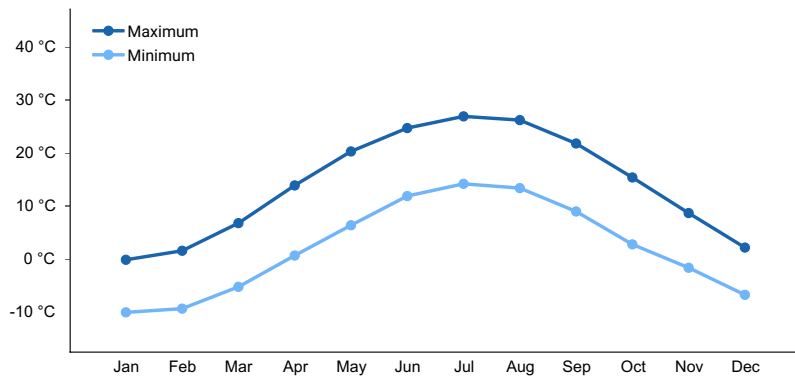


Figure 4. Monthly average minimum and maximum temperature

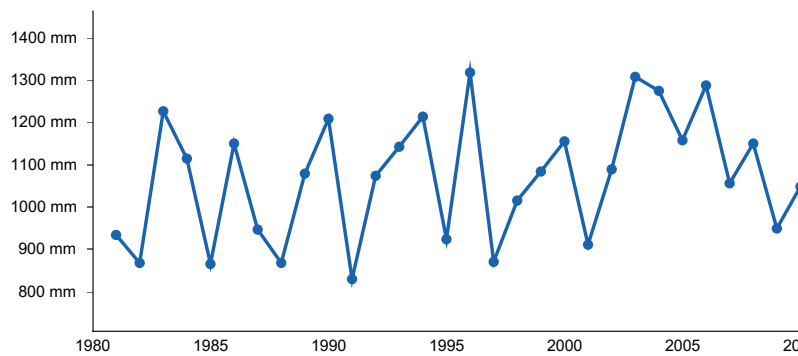


Figure 5. Annual precipitation pattern

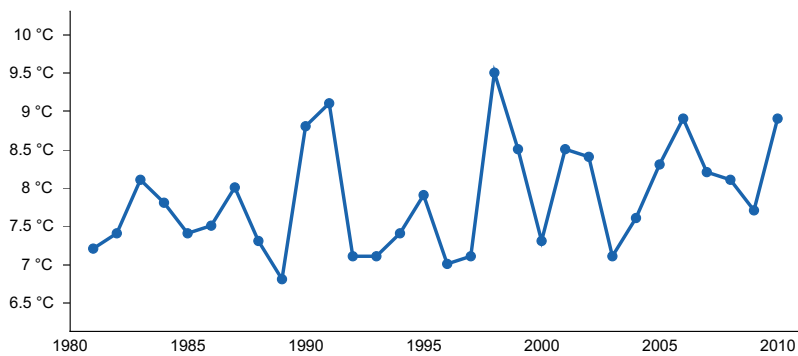


Figure 6. Annual average temperature pattern

Climate stations used

- (1) BINGHAMTON [USW00004725], Johnson City, NY
- (2) STROUDSBURG [USC00368596], East Stroudsburg, PA
- (3) TOWANDA 1 S [USC00368905], Towanda, PA

- (4) MONTROSE [USC00365915], Montrose, PA
- (5) CORNING [USC00301787], Corning, NY
- (6) ROCK HILL 3 SW [USC00307210], Rock Hill, NY
- (7) CANTON [USC00361212], Canton, PA

Influencing water features

Soil features

The soils consists of very deep, well drained, and coarse-loamy soils formed in recent alluvium. Subsurface rock fragments range up to 35% by volume. Representative soils are Barbour, Delaware, Hamplain, Tioga, Trestle, and Wenonah.

Table 5. Representative soil features

Parent material	(1) Alluvium—sandstone (2) Alluvium—shale and siltstone (3) Alluvium—sedimentary rock
Family particle size	(1) Loamy-skeletal (2) Coarse-loamy (3) Coarse-silty
Drainage class	Well drained
Surface fragment cover >3"	0–10%
Subsurface fragment volume ≤3" (Depth not specified)	2–40%
Subsurface fragment volume >3" (Depth not specified)	2–50%

Ecological dynamics

[Caveat: The vegetation information contained in this section and is only provisional, based on concepts, not yet validated with field work.*]

Additional and more localized vegetation information is provided by the State Natural Heritage Programs of Pennsylvania.

The Laurentian-Acadian Floodplain Forest system is characteristic of this ecological site and to a minor extent the Central Appalachian River Floodplain Forest system (NatureServe 2015). This floodplain forest develops along medium to large river systems with a medium to low gradient. The vegetation is often a mosaic of forest, woodland, shrub land, and herbaceous communities. However, due to flooding, shrubs are typically less developed and vines more developed. The characteristic trees are *Acer saccharinum* (silver maple) and *Populus deltoides* (eastern cottonwood), but *Acer saccharum* (sugar maple) may occur on slightly elevated river terraces undisturbed by agriculture.

Disturbances are related to flood magnitude, frequency, and seasonal timing. At higher elevations in the floodplains and floodplain terraces, much of this ecological site has been converted to agriculture.

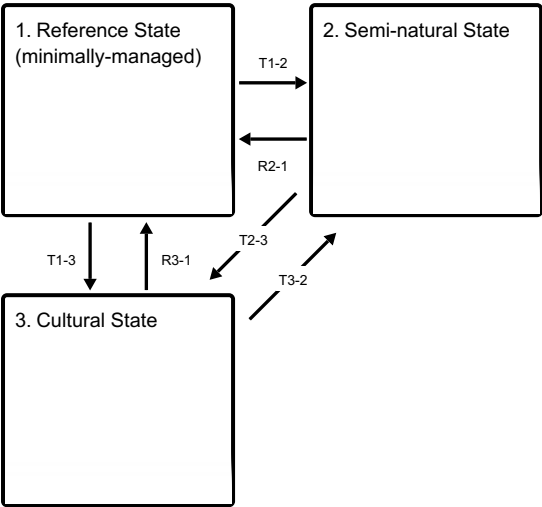
The reference community occurs on high river levees that receive active sedimentation. Silver maple is the dominant tree with eastern cottonwood and American elm scattered throughout. This community is characterized by a lush ground cover and the presences of shrubs such as spicebush, southern arrowwood, and silky dogwood. White snakeroot, stinging nettle, Virginia creeper, great ragweed, riverbank wild rye, and Canada goldenrod are common herbaceous plants. Above plant summary from Silver maple / White snakeroot community description (Metzler and Barrett, 2006).

The information presented is representative of very complex vegetation communities. Key indicator plants and ecological processes are described to help inform land management decisions. Plant communities will differ across the MLRA because of the naturally occurring variability in weather, soils, and geography. The reference plant

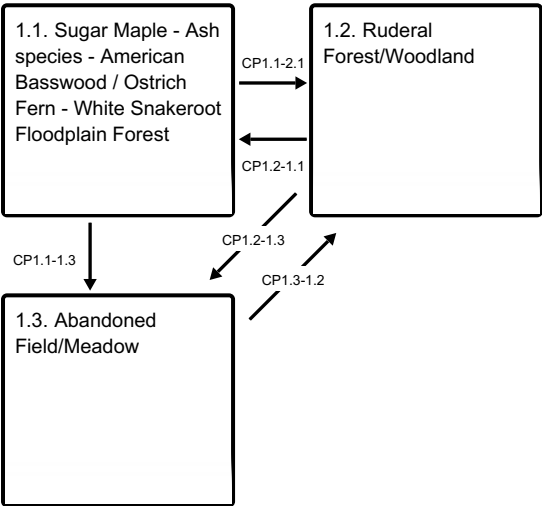
community is not necessarily the management goal. The drafts of species lists are merely representative and are not botanical descriptions of all species occurring, or potentially occurring, on this site. They are not intended to cover every situation or the full range of conditions, species, and responses for the site.

State and transition model

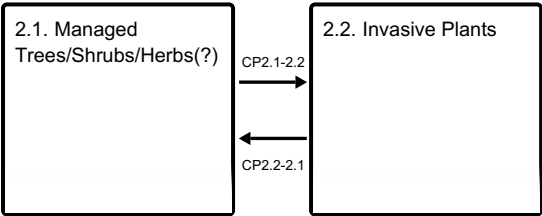
Ecosystem states



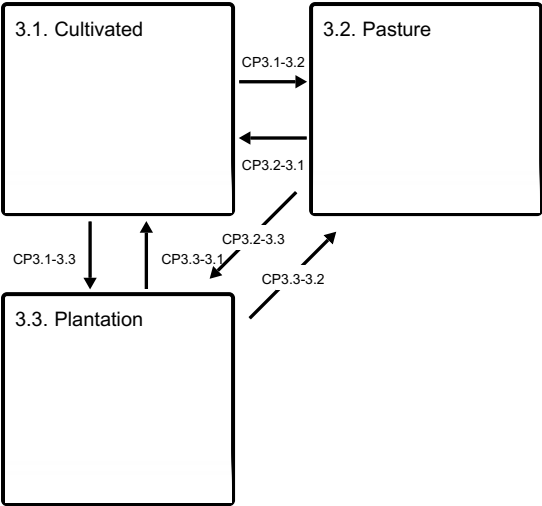
State 1 submodel, plant communities



State 2 submodel, plant communities



State 3 submodel, plant communities



State 1
Reference State (minimally-managed)

High Floodplain Levee

Community 1.1
Sugar Maple - Ash species - American Basswood / Ostrich Fern - White Snakeroot Floodplain Forest

Community 1.2
Ruderal Forest/Woodland

Community 1.3
Abandoned Field/Meadow

Pathway CP1.1-2.1
Community 1.1 to 1.2

Disturbance

Pathway CP1.1-1.3
Community 1.1 to 1.3

Disturbance

Pathway CP1.2-1.1
Community 1.2 to 1.1

Abandonment, Sucession

Pathway CP1.2-1.3
Community 1.2 to 1.3

Disturbance

Pathway CP1.3-1.2
Community 1.3 to 1.2

Abandonment, Succession

State 2

Semi-natural State

Floodplain forests altered by disturbance (usually w/invasive plants) or managed floodplain forests

Community 2.1

Managed Trees/Shrubs/Herbs(?)

Community 2.2

Invasive Plants

Pathway CP2.1-2.2

Community 2.1 to 2.2

Disturbance, Invasive species establishment

Pathway CP2.2-2.1

Community 2.2 to 2.1

Invasive spp. Control, Forest mgmt.

State 3

Cultural State

Different phase of intense land use - may be cultivated crops, pasture/hay, or plantations (including nursery crops)

Community 3.1

Cultivated

Community 3.2

Pasture

Community 3.3

Plantation

Pathway CP3.1-3.2

Community 3.1 to 3.2

Changing agricultural phases

Pathway CP3.1-3.3

Community 3.1 to 3.3

Changing agricultural phases

Pathway CP3.2-3.1

Community 3.2 to 3.1

Changing agricultural phases

Pathway CP3.2-3.3

Community 3.2 to 3.3

Changing agricultural phases

Pathway CP3.3-3.1

Community 3.3 to 3.1

Changing agricultural phases

Pathway CP3.3-3.2

Community 3.3 to 3.2

Changing agricultural phases

Transition T1-2

State 1 to 2

altered by Disturbance or Management

Conservation practices

Tree/Shrub Establishment
Forest Stand Improvement
Forest Land Management

Transition T1-3

State 1 to 3

Disturbance, clearing, cutting

Conservation practices

Brush Management
Land Clearing
Herbaceous Weed Control

Restoration pathway R2-1

State 2 to 1

Plant removals, plantings, Invasive plant control, successional mgmt., forestry practices Restoration & Mgmt, Forest Stand Improvement, Early Successional Habitat Development, Upland Wildlife Mgmt, Invasive spp. Control, Plant establishment

Conservation practices

Early Successional Habitat Development/Management
Restoration and Management of Natural Ecosystems
Native Plant Community Restoration and Management
Forest Land Management
Invasive Plant Species Control

Transition T2-3

State 2 to 3

Disturbance, clearing, cutting

Conservation practices

Brush Management
Land Clearing

Restoration pathway R3-1

State 3 to 1

Plant removals, plantings, Invasive plant control, successional mgmt., forestry practices Restoration & Mgmt, Forest Stand Improvement, Early Successional Habitat Development, Upland Wildlife Mgmt, Invasive spp. Control, Plant establishment

Conservation practices

Early Successional Habitat Development/Management
Restoration and Management of Natural Ecosystems
Native Plant Community Restoration and Management
Forest Land Management
Invasive Plant Species Control

Transition T3-2

State 3 to 2

Abandonment, Plant establishment, Forest mgmt.

Conservation practices

Tree/Shrub Establishment
Forest Stand Improvement
Forest Land Management

Additional community tables

Inventory data references

Site Development and Testing Plan:

Future work to validate the vegetation information in this provisional ecological site description is needed. This will include field activities to collect low and medium intensity sampling and analysis of that data. Field reviews should be done by soil scientists and vegetation specialists. A final field review, peer review, quality control, and quality assurance reviews of the ESD will be needed to produce the final approved level document. Reviews of the project plan are to be conducted by the Ecological Site Technical Team.

Other references

Edinger, G.J., Evans, D.J., Gebauer, S., Howard, T.G., Hunt, D.M., and A.M. Olivero, A.M. (eds.). 2014. Ecological Communities of New York State, Second Edition: A revised and expanded edition of Carol Reschke's Ecological Communities of New York State. New York Natural Heritage Program, New York State Department of Environmental Conservation, Albany, NY.

Zimmerman, E., T. Davis, G. Podniesinski, M. Furedi, J. McPherson, S. Seymour, B. Eichelberger, N. Dewar, J. Wagner, and J. Fike (editors). 2012. Terrestrial and Palustrine Plant Communities of Pennsylvania, 2nd Edition. Pennsylvania Natural Heritage Program, Pennsylvania Department of Conservation and Natural Resources, Harrisburg, Pennsylvania.

Approval

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	05/17/2024
Approved by	Nels Barrett
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:**
