

## Ecological site F140XY028NY Moist Till Upland

Last updated: 5/20/2020  
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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 MLRA is a glaciated area of low relief dominated by broad expanses of nearly level, sandy deltas and shallow lacustrine basins or plains punctuated by low hills of glacial till. Rivers and streams have cut relatively deep but narrow valleys across the plain. Elevation ranges from 80 to 1,000 feet, increasing gradually from the St. Lawrence River southward and from Lake Champlain to the east and west. Local relief generally is less than 30 feet, but glacial till ridges, till plains, and some outwash terraces rise 15 to 80 feet above the adjacent plains.

This area has been glaciated, and a thin mantle of till covers most of the bedrock. Extensive areas of sandy glacial outwash and eolian deposits also occur. Some glacial lake sediments have been deposited above glacial moraines. These deposits are thickest in the valleys and thinnest on the ridges and highlands. During the later stages of the Wisconsin glacial period, seawater entered the Champlain Valley and deposited marine sediments that were later covered by freshwater sediments. The marine deposits are unique to the area.

This area supports hardwoods. The beech-birch-sugar maple forest type is the dominant climax forest type on uplands. Associated with this type are basswood, American elm, maple species, white ash, black cherry, and white pine. The aspen-birch type, earlier in succession, is economically important. Such species as eastern hemlock, red maple, American elm, and spruce are on wet soils.

Some of the major wildlife species in this area are white-tailed deer, red fox, raccoon, beaver, woodchuck, muskrat, cottontail, ruffed grouse, and woodcock.

### Classification relationships

NRCS:

Land Resource Region: R - Northeastern Forage and Forest Region

MLRA: 142X–St. Lawrence-Champlain Plain

LRU: B - Mesic Mean Annual Soil Temperature

### Ecological site concept

Landform/Landscape Position:

The site occurs on hills, knolls, ridges, benches, and till plains. Slopes range from 0 to 50 percent.

Soils:

The site consists of moderately deep to very deep, moderately well drained and somewhat poorly drained soils that formed in glacial till derived mostly from a combination sandstone, shale, siltstone, and limestone. Correlated soils are Angola, Aurora, Busti, Chautauqua, Conesus, Danley, Darien, Fremont, Greene, Hornell, Hornellsville, Kanona, Opark, Ravenna, Remsen, and Towerville.

## Vegetation

The reference community coincides with both PA Natural Heritage Program's Red oak - mixed hardwood forest and Mixed mesophytic forest.

**Table 1. Dominant plant species**

Tree	(1) <i>Quercus rubra</i> (2) <i>Acer saccharum</i>
Shrub	(1) <i>Lindera benzoin</i>
Herbaceous	(1) <i>Symplocarpus foetidus</i> (2) <i>Carex</i>

## Physiographic features

The site occurs on hills, benches, and till plains. Slopes range from 0 to 50 percent.

**Table 2. Representative physiographic features**

Landforms	(1) Till plain (2) Hill (3) Bench
Slope	0–35%

**Table 3. Representative physiographic features (actual ranges)**

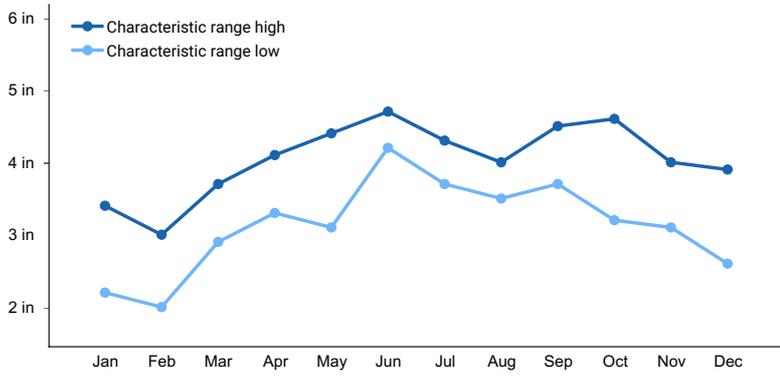
Slope	0–50%
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## Climatic features

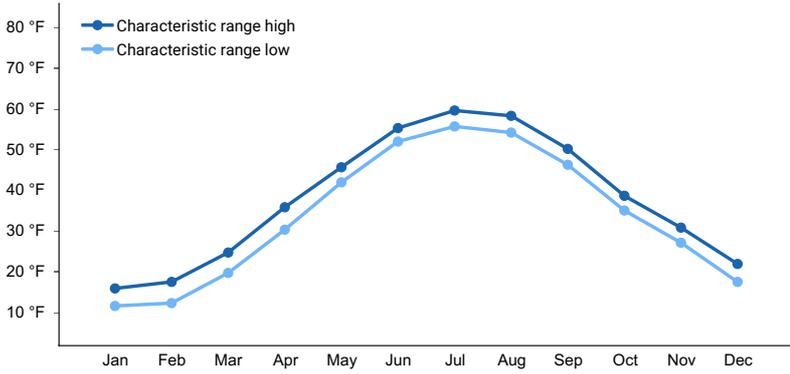
Mean annual precipitation is 43 inches and evenly distributed throughout the year. Most of the rainfall occurs as high intensity, convective thunderstorms during the summer. Snowfall is common from late in autumn to early spring. Average frost-free and freeze-free days are 122 and 153, respectively.

**Table 4. Representative climatic features**

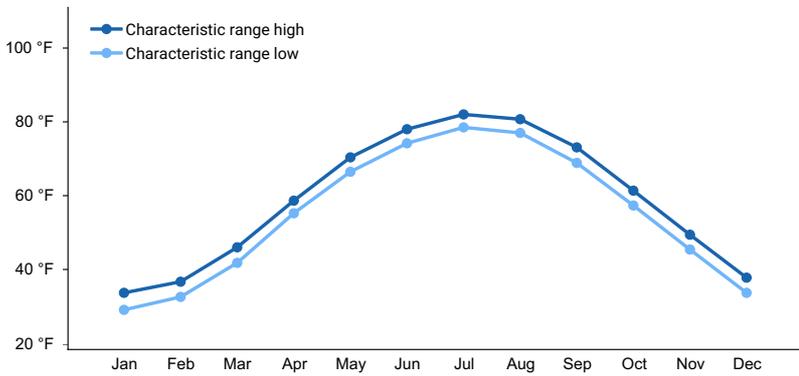
Frost-free period (characteristic range)	110-134 days
Freeze-free period (characteristic range)	136-168 days
Precipitation total (characteristic range)	38-49 in
Frost-free period (actual range)	101-136 days
Freeze-free period (actual range)	136-168 days
Precipitation total (actual range)	36-51 in
Frost-free period (average)	122 days
Freeze-free period (average)	154 days
Precipitation total (average)	43 in



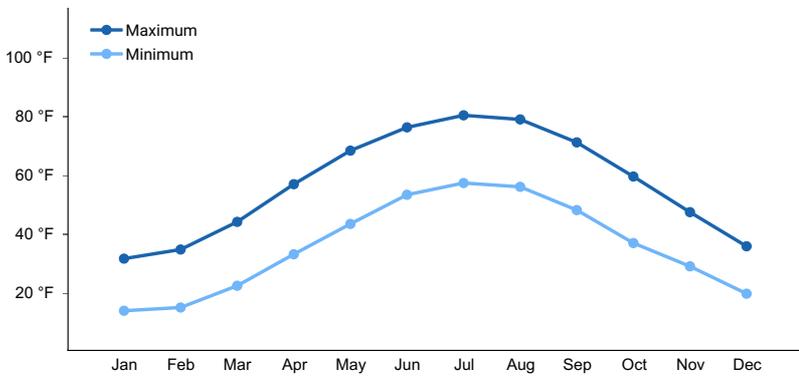
**Figure 1. Monthly precipitation range**



**Figure 2. Monthly minimum temperature range**



**Figure 3. Monthly maximum temperature range**



**Figure 4. Monthly average minimum and maximum temperature**

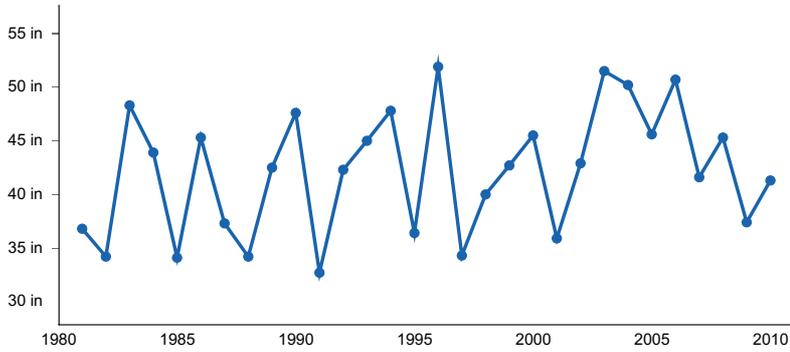


Figure 5. Annual precipitation pattern

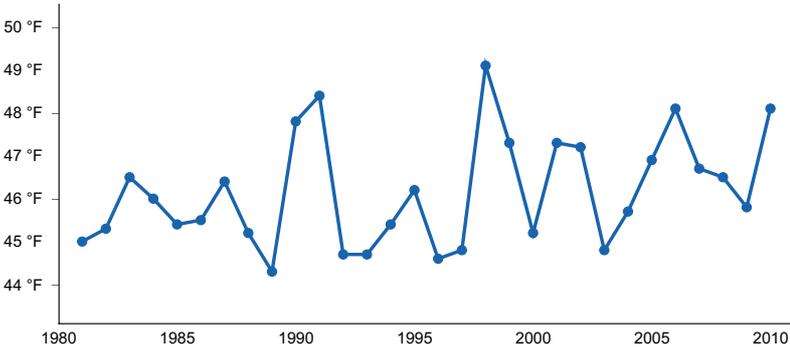


Figure 6. Annual average temperature pattern

### 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 site consists of moderately deep to very deep, moderately well drained and somewhat poorly drained soils that formed in glacial till derived mostly from a combination sandstone, shale, siltstone, and limestone. Correlated soils are Angola, Aurora, Busti, Chautauqua, Conesus, Danley, Darien, Fremont, Greene, Hornell, Hornellsville, Kanona, Opark, Ravenna, Remsen, and Towerville.

Table 5. Representative soil features

Parent material	(1) Till–limestone, sandstone, and shale (2) Till–siltstone
Drainage class	Somewhat poorly drained to moderately well drained

### Ecological dynamics

The reference community coincides with both PA Natural Heritage Program's Red oak - mixed hardwood forest and Mixed mesophytic forest.

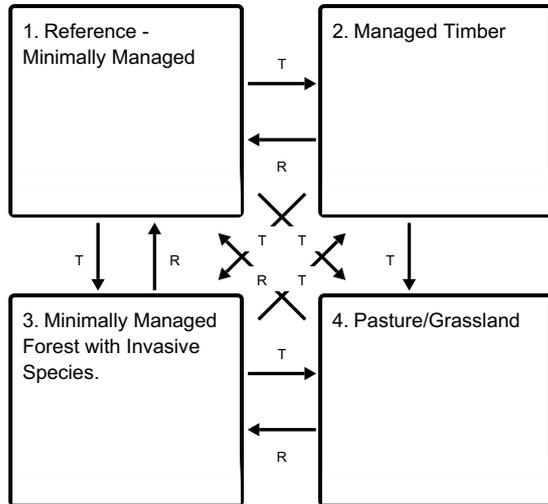
Depending on site variability, common trees and shrubs include northern red oak, sugar maple, red maple, yellow

birch white ash, basswood, American beech, shagbark hickory, spicebush, witch-hazel, and hop-hornbeam.

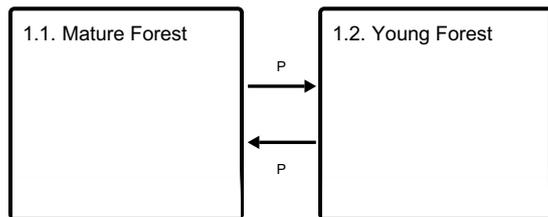
Dynamics includes conversion of site into agricultural production and invasive species establishment. Disturbances include wind, ice, insects, and land clearing or timber harvest.

## State and transition model

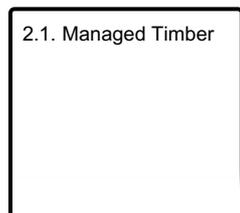
### Ecosystem states



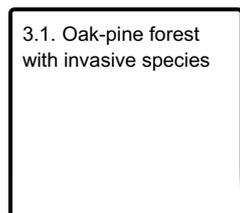
### State 1 submodel, plant communities



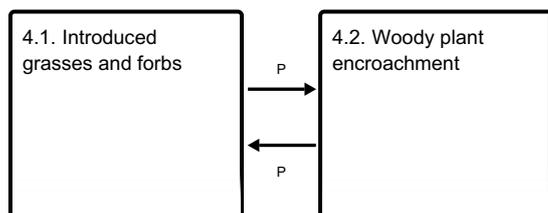
### State 2 submodel, plant communities



### State 3 submodel, plant communities



### State 4 submodel, plant communities



## State 1

### Reference - Minimally Managed

The reference community coincides with both PA Natural Heritage Program's Red oak - mixed hardwood forest and Mixed mesophytic forest. Dynamics includes conversion of site into agricultural production and invasive species establishment. Disturbances include wind, ice, insects, and land clearing or timber harvest. This forest may have at one time been cleared or plowed during colonial times.

**Characteristics and indicators.** Soil may have evidence of an historic plow layer (Ap horizon).

**Resilience management.** Ensure that regenerating trees and shrubs are not heavily browsed by deer that they cannot replace overstory trees. Deer have been shown to have negative effects on forest understories (New York Natural Heritage Program, 2020). Avoid cutting old-growth forests.

### **Community 1.1 Mature Forest**

Mature, late successional closed canopy forest. Depending on site variability, common trees and shrubs include northern red oak, sugar maple, red maple, yellow birch white ash, basswood, American beech, shagbark hickory, spicebush, witch-hazel, and hop-hornbeam.

### **Community 1.2 Young Forest**

Open canopy, early successional, young forest.

### **Pathway P Community 1.1 to 1.2**

Natural disturbances - wind/ice storm, tree fall, and insect damage.

### **Conservation practices**

Early Successional Habitat Development/Management
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### **Pathway P Community 1.2 to 1.1**

Time (succession).

### **State 2 Managed Timber**

The state is characterized by active logging. Composition of forest stands will vary based on management objectives.

### **Community 2.1 Managed Timber**

### **State 3 Minimally Managed Forest with Invasive Species.**

Invasive species such as Japanese barberry, bush honeysuckle, multiflora rose, garlic mustard, and stiltgrass are common in the understory.

### **Community 3.1 Oak-pine forest with invasive species**

### **State 4**

## **Pasture/Grassland**

Forest has been cleared and grasses and forbs have been introduced for livestock grazing, hay production, and/or wildlife.

### **Community 4.1 Introduced grasses and forbs**

### **Community 4.2 Woody plant encroachment**

#### **Pathway P Community 4.1 to 4.2**

Abandonment (lack of mowing or fire suppression)

#### **Pathway P Community 4.2 to 4.1**

Mowing, prescribed fire, and/or brush management.

#### **Conservation practices**

Brush Management
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### **Transition T State 1 to 2**

Timber harvest; logging.

### **Transition T State 1 to 3**

Introduction of invasive species usually after disturbance.

### **Transition T State 1 to 4**

Land use conversion.

### **Restoration pathway R State 2 to 1**

Time (succession). Forest stand improvement, restoration.

### **Transition T State 2 to 3**

Introduction of invasive species. Lack of timber management.

### **Transition T State 2 to 4**

Land use conversion

### **Restoration pathway R**

### **State 3 to 1**

Brush management, invasive species management.

### **Transition T State 3 to 2**

Timber management/harvest, logging.

### **Transition T State 3 to 4**

Land use conversion.

### **Restoration pathway R State 4 to 1**

Abandonment, Time (succession), forest restoration.

### **Restoration pathway R State 4 to 3**

Abandonment, time (sucession) and introduction of invasive species.

## **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**

New York Natural Heritage Program. 2020. Online Conservation Guide for Appalachian oak-pine forest. Available from: <https://guides.nynhp.org/appalachian-oak-pine-forest/>. Accessed January 21, 2020.

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**

Nels Barrett, 5/20/2020

### **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	04/27/2024
Approved by	Nels Barrett
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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