

## **Ecological site F140XY021NY Dry Outwash**

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 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:

Appalachian Oak-Pine Forest

PA Natural Heritage Program Plant Community Classification:

Dry oak - heath forest

Pitch pine - heath woodland

International Vegetation Classification Associations:

Eastern White Pine - (Northern Red Oak, Black Oak) - American Beech Forest (CEGL006293 )

others?

NatureServe Ecological Systems:

Laurentian-Acadian Pine-Hemlock-Hardwood Forest (CES201.563 )  
Northeastern Interior Dry-Mesic Oak Forest (CES202.592 )

## Ecological site concept

Landform/Landscape Position:

The site occurs on outwash plains, terraces, moraines, kames, and eskers . Slopes range from 0 to 60 percent.

Soils:

The soils consists of very deep, well to somewhat excessively drained, gravelly soils that formed in glacialfluvial material. Representative soils are Tunkhannock, Chenango, Wyoming, and Allard.

Vegetation:

The reference community is oak-pine forest/woodland characterized by black oak, chestnut oak, eastern white pine, pitch pine, sassafras, black birch, American beech, witch-hazel, black huckleberry, lowbush blueberry, maple-leaved viburnum, and Pennsylvania sedge.

**Table 1. Dominant plant species**

Tree	(1) <i>Quercus velutina</i> (2) <i>Pinus strobus</i>
Shrub	(1) <i>Gaylussacia baccata</i> (2) <i>Vaccinium angustifolium</i>
Herbaceous	(1) <i>Carex pensylvanica</i> (2) <i>Aralia nudicaulis</i>

## Physiographic features

The site occurs on outwash plains, terraces, moraines, kames, and eskers . Slopes range from 0 to 60 percent.

**Table 2. Representative physiographic features**

Landforms	(1) Outwash plain (2) Outwash terrace (3) Esker (4) Kame
Slope	0–60%

## 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 3. 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

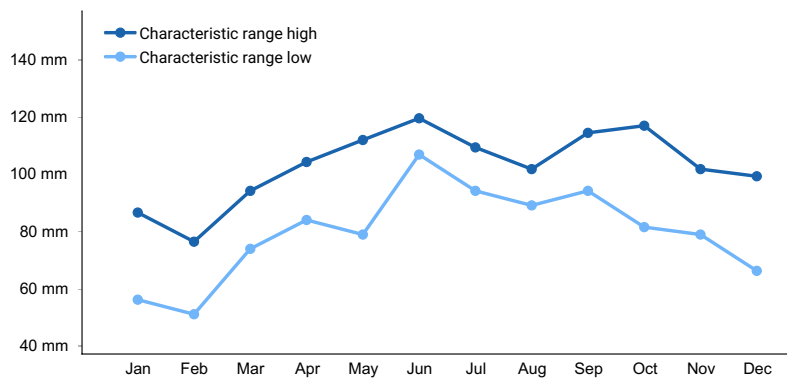


Figure 1. Monthly precipitation range

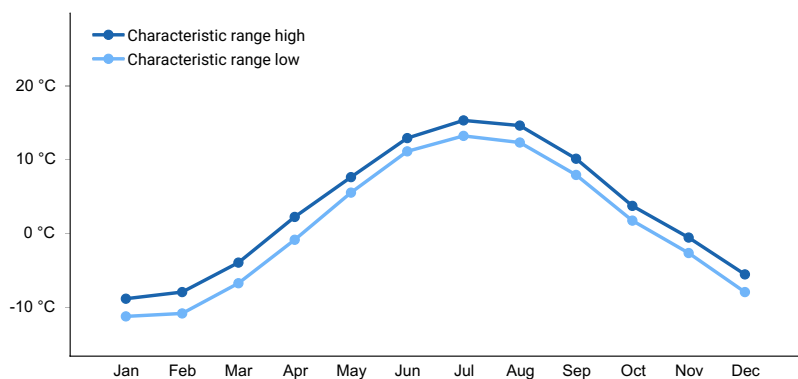


Figure 2. Monthly minimum temperature range

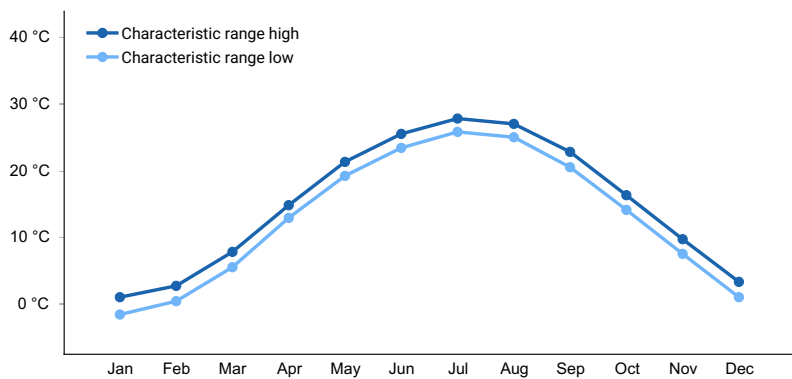


Figure 3. Monthly maximum temperature range

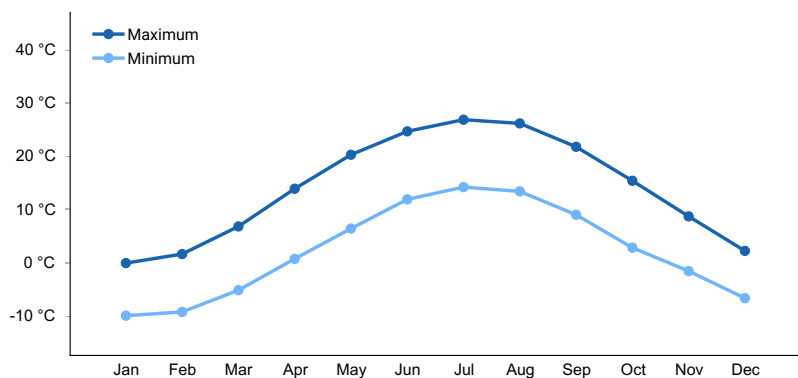


Figure 4. Monthly average minimum and maximum temperature

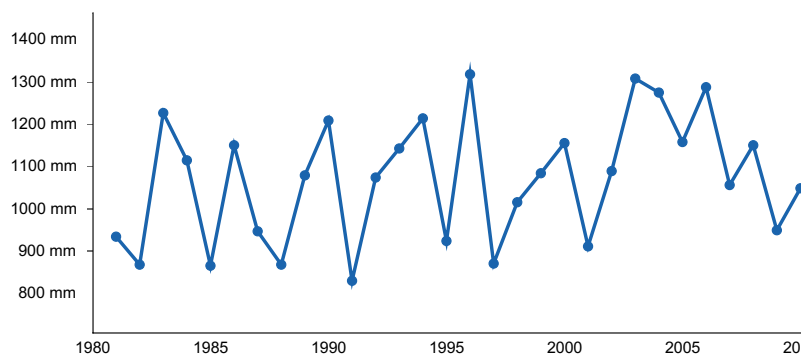


Figure 5. Annual precipitation pattern

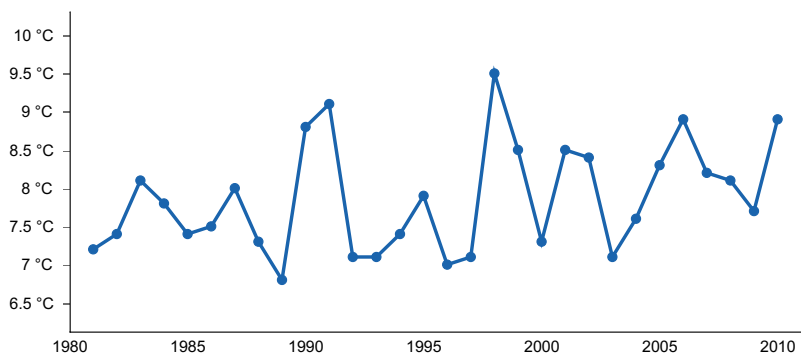


Figure 6. Annual average temperature pattern

### 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 to somewhat excessively drained, gravelly soils that formed in glacialfluvial material. Representative soils are Tunkhannock, Chenango, Wyoming, and Allard.

Table 4. Representative soil features

Parent material	(1) Glaciofluvial deposits–shale and siltstone (2) Glaciofluvial deposits–sandstone
Surface texture	(1) Gravelly loam (2) Very gravelly sandy loam
Family particle size	(1) Loamy-skeletal
Drainage class	Well drained to somewhat excessively drained

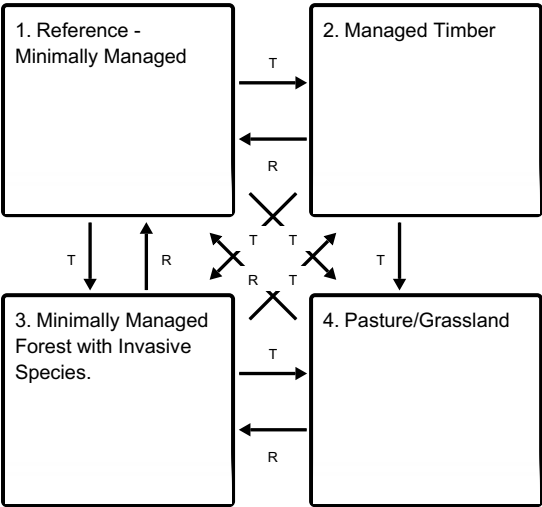
### Ecological dynamics

The reference community is oak-pine forest/woodland characterized by black oak, chestnut oak, eastern white pine, pitch pine, sassafras, black birch, American beech, witch-hazel, black huckleberry, lowbush blueberry, mountain laurel, maple-leaved viburnum, and Pennsylvania sedge.

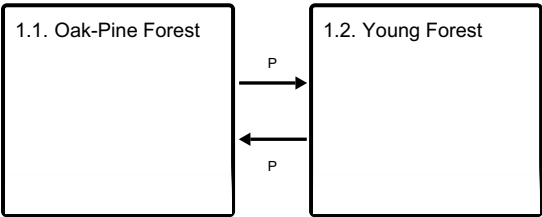
Disturbances or threats to these forests and woodlands include fragmentation, invasive species, over-browsing by deer, fire suppression, insects, and air pollution (New York Natural Heritage Program, 2020).

State and transition model

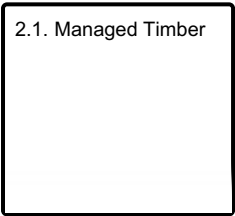
Ecosystem states



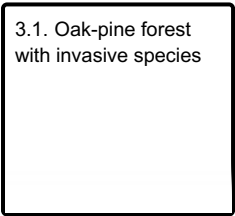
State 1 submodel, plant communities



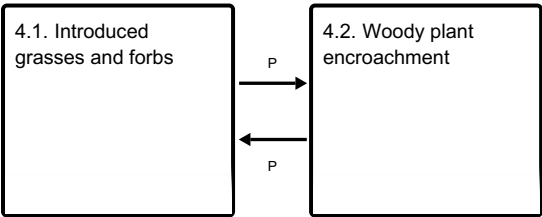
State 2 submodel, plant communities



State 3 submodel, plant communities



State 4 submodel, plant communities



State 1  
Reference - Minimally Managed

Reference is an oak-pine forest. Natural disturbances such as wind and ice storms, tree fall, insect damage will create openings for an early successional plant community or young forest. 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**

### **Oak-Pine Forest**

The reference community is oak-pine forest/woodland characterized by black oak, chestnut oak, eastern white pine, pitch pine, sassafras, black birch, American beech, witch-hazel, black huckleberry, lowbush blueberry, mountain laurel, maple-leaved viburnum, and Pennsylvania sedge.

## **Community 1.2**

### **Young Forest**

More open canopy, black birch is a common early successional tree.

## **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)	
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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:**

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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:**
-