

Ecological site F140XY007NY Frigid Moist Dense Till

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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

EPA Ecoregions:

Level III: 60 - Northern Allegheny Plateau and 58 - Northeastern Highlands

Level IV: 60a - Glaciated Low Allegheny Plateau, 60b - Delaware-Neversink Highlands, 60c - Catskills Transition, and 58y - Catskill High Peaks

USDA USFS:

200 Humid Temperate Domain

212 Laurentian Mixed Forest Province

M212 Adirondack - New England Mixed Forest - Coniferous Forest - Alpine Meadow Province

NY Natural Heritage Program Plant Community Classifications:

International Vegetation Classification Associations:

NatureServe Ecological Systems:

Ecological site concept

Landform/Landscape Position:

The site occurs on glaciated plateaus, till plains, and hills. Slopes range from 0-35%.

Soils:

The soils consists of very deep, moderately well to somewhat poorly drained soils formed in a thin mantle of flaggy and coarse-loamy till derived from sandstone, siltstone, and shale. Soil temperature regime is frigid. Reaction is very strongly acid or strongly acid throughout the mineral soil. Soil component are Onteora, Ontusia, Willdin, and Willowemoc.

Vegetation:

Reference community is a red maple dominant hardwood Forest. Characteristic vegetation includes:

Trees: Red maple (*Acer rubrum*), American beech (*Fagus grandifolia*), sugar maple (*Acer saccharum*), red oak (*Quercus rubra*), yellow birch (*Betula alleghaniensis*). Conifers such as eastern white pine (*Pinus strobus*) and hemlock (*Tsuga canadensis*) are minor components.

Shrubs: Spicebush (*Lindera benzoin*), highbush blueberry (*Vaccinium corymbosum*), American witch-hazel (*Hamamelis virginiana*), hobblebush (*Viburnum lantanoides*).

Herbaceous: Cinnamon fern (*Osmundastrum cinnamomeum*), Jack-in-the-pulpit (*Arisaema triphyllum*), and sessile-leaved bellwort (*Uvularia sessilifolia*)

Table 1. Dominant plant species

Tree	(1) <i>Acer saccharum</i> (2) <i>Acer rubrum</i>
Shrub	(1) <i>Lindera benzoin</i>
Herbaceous	(1) <i>Osmunda cinnamomea</i>

Physiographic features

The site occurs on glaciated plateaus, till plains, and hills. Slopes range from 0-35%. Elevation ranges from 1000-3500 ft.

Table 2. Representative physiographic features

Landforms	(1) Upland > Hill
Elevation	305–1,097 m
Slope	0–5%

Climatic features

Table 3. Representative climatic features

Frost-free period (characteristic range)	90-109 days
Freeze-free period (characteristic range)	124-143 days
Precipitation total (characteristic range)	965-1,295 mm

Frost-free period (actual range)	89-110 days
Freeze-free period (actual range)	118-144 days
Precipitation total (actual range)	965-1,524 mm
Frost-free period (average)	98 days
Freeze-free period (average)	132 days
Precipitation total (average)	1,168 mm

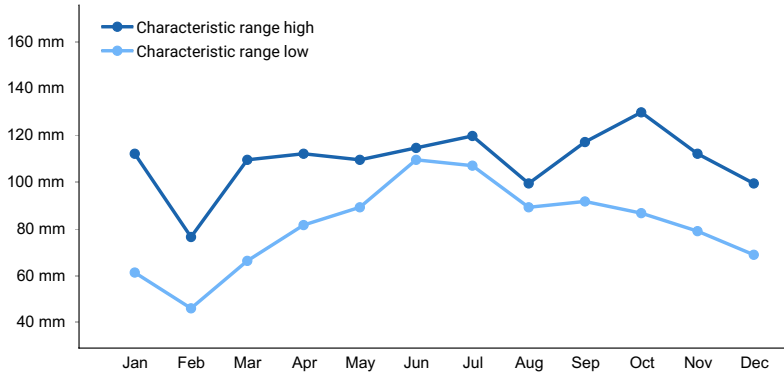


Figure 1. Monthly precipitation range

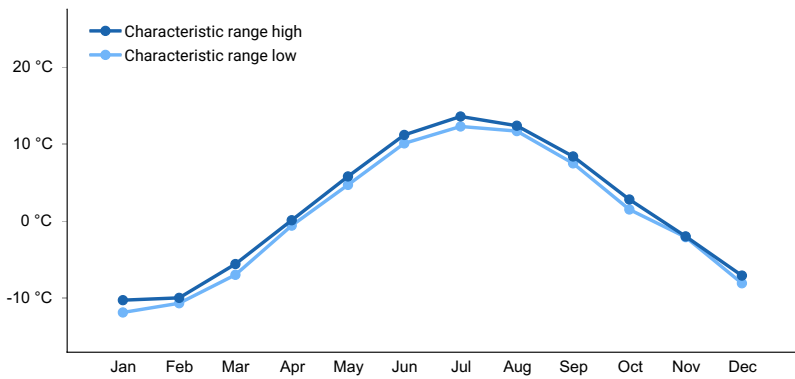


Figure 2. Monthly minimum temperature range

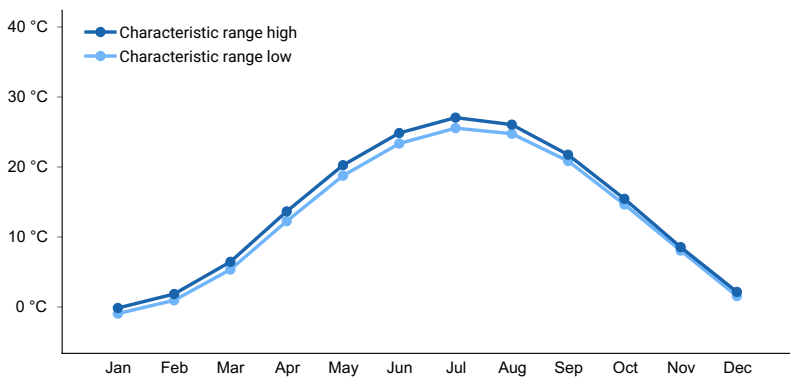


Figure 3. Monthly maximum temperature range

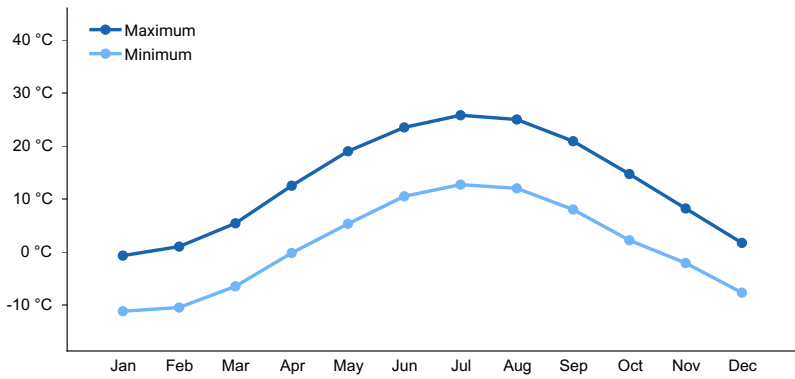


Figure 4. Monthly average minimum and maximum temperature

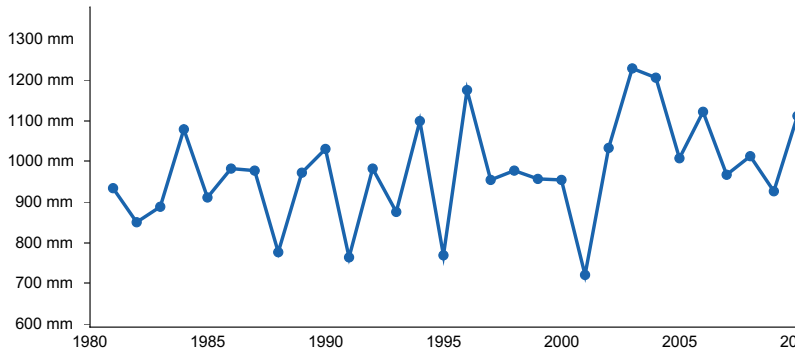


Figure 5. Annual precipitation pattern

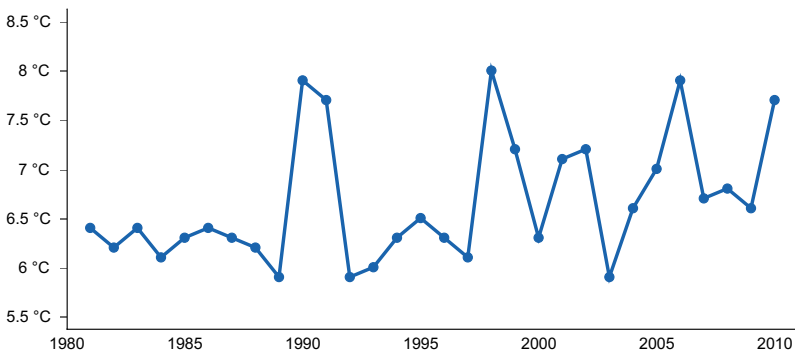


Figure 6. Annual average temperature pattern

Climate stations used

- (1) DELHI 2 SE [USC00302036], Delancey, NY
- (2) LANSING MANOR [USC00304575], Gilboa, NY
- (3) SLIDE MTN [USC00307799], Big Indian, NY
- (4) EAST JEWETT [USC00302366], Tannersville, NY
- (5) WELLSVILLE [USC00309072], Wellsville, NY
- (6) ALFRED [USC00300085], Alfred Station, NY

Influencing water features

Soil features

The soils consists of very deep, moderately well to somewhat poorly drained soils formed in a thin mantle of flaggy and coarse-loamy till derived from sandstone, siltstone, and shale. Soil temperature regime is frigid. Reaction is very strongly acid or strongly acid throughout the mineral soil. Soil component are Onteora, Ontusia, Willdin, and Willowemoc.

Table 4. Representative soil features

Parent material	(1) Till–sandstone and shale (2) Till–siltstone
Surface texture	(1) Flaggy loam
Drainage class	Moderately well drained to somewhat poorly drained
Permeability class	Very slow
Depth to restrictive layer	41–61 cm
Soil depth	152 cm
Surface fragment cover >3"	2%
Available water capacity (Depth not specified)	7.62–10.16 cm
Soil reaction (1:1 water) (Depth not specified)	3.5–7
Subsurface fragment volume <=3" (Depth not specified)	15%
Subsurface fragment volume >3" (Depth not specified)	30%

Ecological dynamics

Reference community is a red maple dominant hardwood Forest. Characteristic vegetation includes:

Trees: Red maple (*Acer rubrum*), American beech (*Fagus grandifolia*), sugar maple (*Acer saccharum*), red oak (*Quercus rubra*), yellow birch (*Betula alleghaniensis*). Conifers such as eastern white pine (*Pinus strobus*) and hemlock (*Tsuga canadensis*) are minor components.

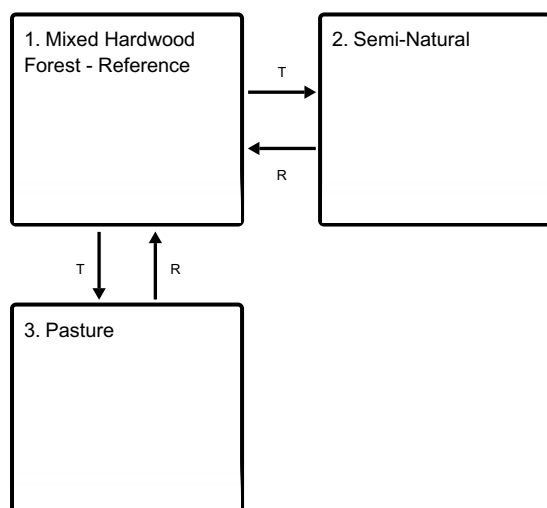
Shrubs: Spicebush (*Lindera benzoin*), highbush blueberry (*Vaccinium corymbosum*), American witch-hazel (*Hamamelis virginiana*), hobblebush (*Viburnum lantanoides*).

Herbaceous: Cinnamon fern (*Osmundastrum cinnamomeum*), Jack-in-the-pulpit (*Arisaema triphyllum*), and sessile-leaved bellwort (*Uvularia sessilifolia*).

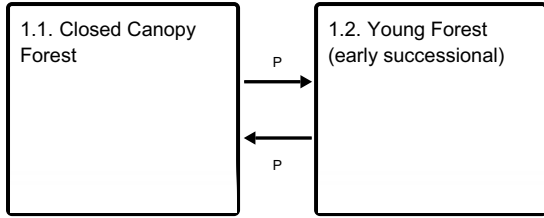
Natural disturbances that create forest canopy openings include windthrow, ice storms, and insect damage. Alternative states are a semi-natural forest (timber harvest, invasive species) and a pasture state.

State and transition model

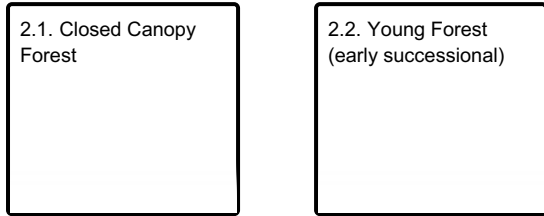
Ecosystem states



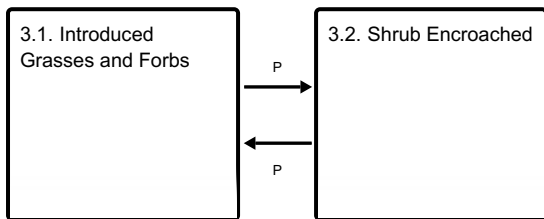
State 1 submodel, plant communities



State 2 submodel, plant communities



State 3 submodel, plant communities



**State 1
Mixed Hardwood Forest - Reference**

Minimally managed hardwood forest. Natural disturbances primarily from weather events, insect damage, tree fall create pockets of young forest communities (early successional). Red maple, sugar maple, American beech, yellow birch, red oak, eastern hemlock, and eastern white pine are some characteristic trees.

**Community 1.1
Closed Canopy Forest**

**Community 1.2
Young Forest (early successional)**

**Pathway P
Community 1.1 to 1.2**

Conservation practices

Early Successional Habitat Development/Management

**Pathway P
Community 1.2 to 1.1**

**State 2
Semi-Natural**

Timber harvest common, invasive species such as bush honeysuckle, oriental bittersweet, Japanese barberry, and multiflora rose may be common in disturbed areas.

**Community 2.1
Closed Canopy Forest**

Community 2.2
Young Forest (early successional)

State 3
Pasture

Forest has been converted to pastureland/grassland for either livestock grazing, hay production, or wildlife habitat.

Community 3.1
Introduced Grasses and Forbs

Grasses and forbs introduces for livestock grazing, hay production, or wildlife habitat.

Community 3.2
Shrub Encroached

Pathway P
Community 3.1 to 3.2

Lack of mowing, grazing, or fire.

Pathway P
Community 3.2 to 3.1

Brush management and/or fire.

Conservation practices

Brush Management
Prescribed Burning

Transition T
State 1 to 2

Human disturbances (roads, timber harvest,) affect species composition and allow the potential for non-native and invasive species to establish and persist.

Transition T
State 1 to 3

Conservation practices

Land Clearing
Forage and Biomass Planting

Restoration pathway R
State 2 to 1

Conservation practices

Brush Management
Forest Stand Improvement
Forest Management Plan - Written
Forest stand improvement for habitat and soil quality
Herbaceous Weed Control

Restoration pathway R State 3 to 1

Conservation practices

Native Plant Community Restoration and Management

Additional community tables

Approval

Nels Barrett, 5/21/2020

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	05/01/2024
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:**
