Ecological site F140XY001NY
Frigid Till Depressions

Last updated: 5/20/2020
Accessed: 05/20/2024

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 Classification:
Spruce-Fir Swamp

Hemlock Hardwood Swamp
Red Maple-Hardwood Swamp

International Vegetation Classification Associations:
Red Spruce - Balsam Fir / Creeping Snowberry / Cinnamon Fern / Peatmoss species Swamp Forest
(CEGL006312)
Eastern Hemlock - Yellow Birch / Common Winterberry / Peatmoss species Swamp Forest (CEGL006226)
Eastern Hemlock / Great Laurel / Peatmoss species Swamp Forest (CEGL006279)
Yellow Birch - Red Maple - (Eastern Hemlock, Balsam Fir) / Cinnamon Fern Swamp Forest (CEGL006380)

NatureServe Ecological Systems
North-Central Appalachian Acidic Swamp (CES202.604)
Northern Appalachian-Acadian Conifer-Hardwood Acidic Swamp (CES201.574)

Ecological site concept

Climate:
Mean annual precipitation is 46 inches and evenly distributed throughout the year. Most of the rainfall occurs as high
intensity, convective thunderstorms during the summer. Snowfall is heavy from late in autumn to early spring.
Average frost-free and freeze-free days are 98 and 132, respectively.

Landform/Landscape Position:
The site occurs in upland upland depressions and on bedrock controlled benches and steps on mountain sides and
upland flats. Slopes range from 0 to 8 percent.

Soils:
The soils consists of very deep to shallow, poorly drained and very poorly drained soils formed in 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 components include Suny, Norchip, and Torull.

Vegetation:
Reference community is a forested wetland. Characteristic vegetation includes:

Trees: hemlock (*Tsuga canadensis*), red spruce (*Picea rubens*), red maple ((*Acer rubrum*), yellow birch (*Betula
alleghaniensis*), and blackgum (*Nyssa sylvatica*).

Shrubs: highbush blueberry (*Vaccinium corymbosum*), great rhododendron (*Rhododendron maximum*), and
winterberry (*Ilex verticillata*).

Herbaceous: cinnamon fern (*Osmunda cinnamomea*) and sensitive fern (*Onoclea sensibilis*), Jack-in-the-pulpit
(*Arisaema triphyllum*), skunk-cabbage (*Symplocarpus foetidus*), three-fruited sedge (*Carex trisperma*).

Table 1. Dominant plant species

Tree	(1) *Tsuga canadensis* (2) *Acer rubrum*
Shrub	(1) *Vaccinium corymbosum* (2) *Rhododendron maximum*
Herbaceous	(1) *Osmunda cinnamomea* (2) *Carex trisperma*

Physiographic features

The site occurs in upland upland depressions and on bedrock controlled benches and steps on mountain sides and
upland flats. Slopes range from 0 to 8 percent.

Table 2. Representative physiographic features

Landforms	(1) Upland > Depression
Water table depth	0–30 cm
Aspect	Aspect is not a significant factor

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
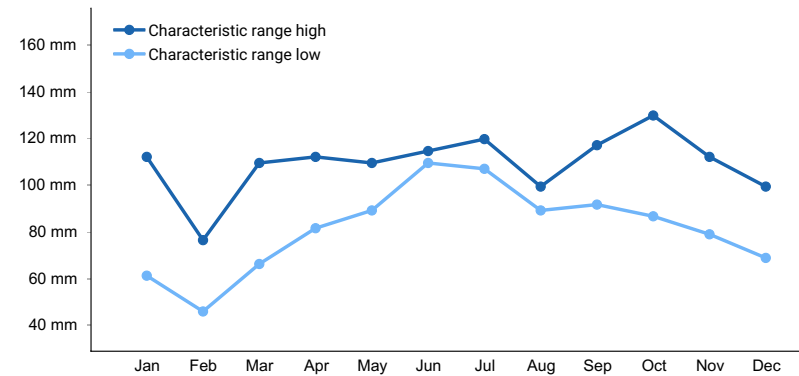
Figure 1. Monthly precipitation range
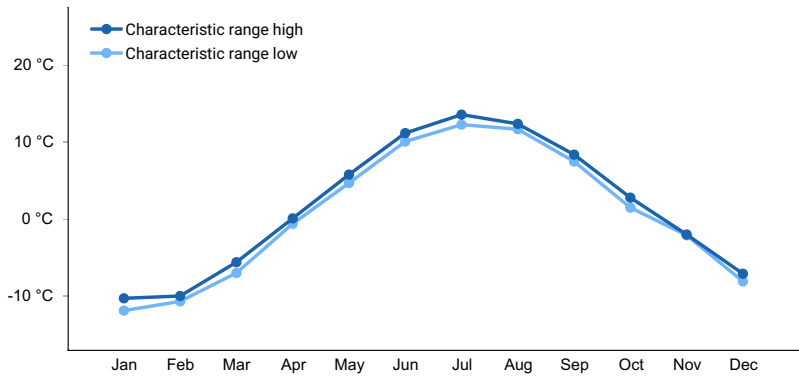
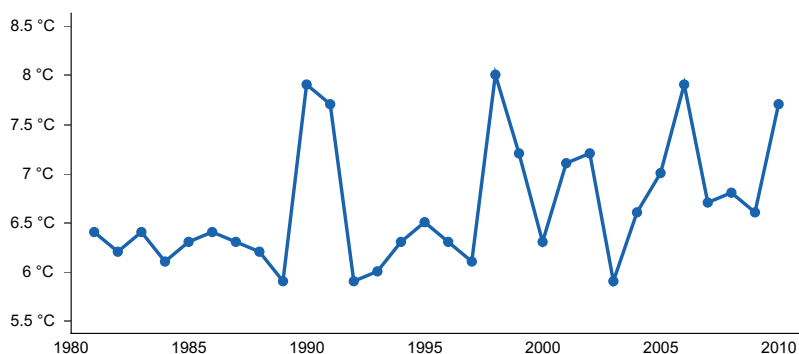**Figure 2. Monthly minimum temperature range**
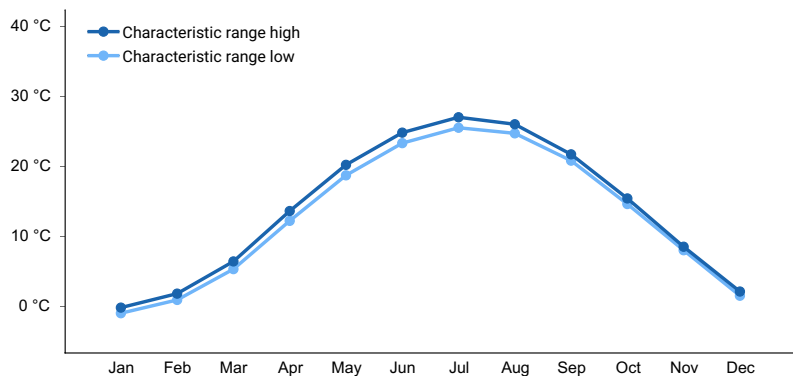
Figure 3. Monthly maximum temperature range
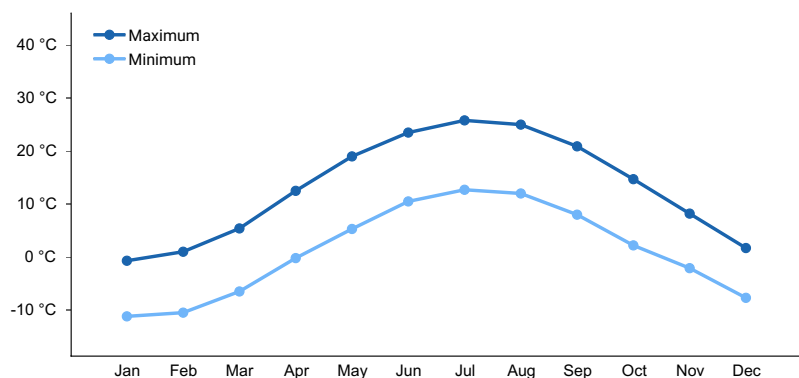
Figure 4. Monthly average minimum and maximum temperature
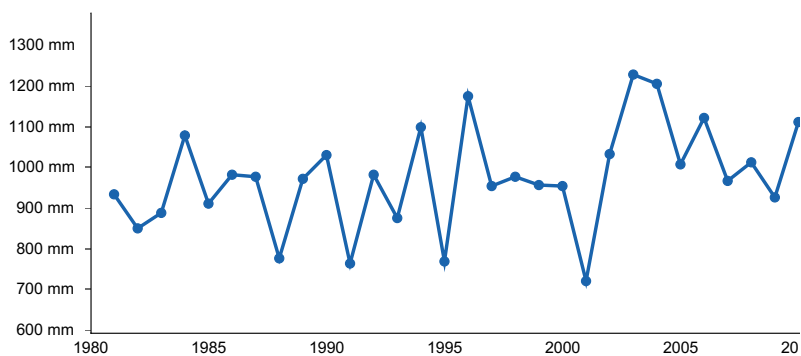
Figure 5. Annual precipitation pattern

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

Wetland description

Palustrine - Forested Mineral Soil Wetlands

Soil features

The soils consists of very deep to shallow, poorly drained and very poorly drained soils formed in 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 components include Suny, Norchip, and Torull.

Table 4. Representative soil features

| Parent material	(1) Till–sandstone and shale (2) Till–siltstone
Family particle size	(1) Fine-loamy (2) Coarse-loamy (3) Loamy
Drainage class	Poorly drained to very poorly drained

Ecological dynamics

Reference community is a forested wetland. Characteristic vegetation includes: hemlock (*Tsuga canadensis*), red spruce (*Picea rubens*), red maple ((*Acer rubrum*), yellow birch (*Betula alleghaniensis*), and blackgum (*Nyssa sylvatica*), highbush blueberry (*Vaccinium corymbosum*), great rhododendron (*Rhododendron maximum*), and winterberry (*Ilex verticillata*), cinnamon fern (*Osmunda cinnamomea*), sensitive fern (*Onoclea sensibilis*), Jack-in-the-pulpit (*Arisaema triphyllum*), skunk-cabbage (*Symplocarpus foetidus*), and three-fruited sedge (*Carex trisperma*). Species composition and dominance will vary based on local site conditions.

Wind, ice storms, insects, and weather extremes are some natural disturbance creating pockets of young forests or early succession habitats. Human related development such as roads, lots, buildings, drainageways, water diversions, etc. will lead to impacts on ecological processes such as hydrology, nutrient cycling, and energy capture. Additionally, unnatural disturbances provide an avenue for non-native species to establish.

State and transition model

Ecosystem states
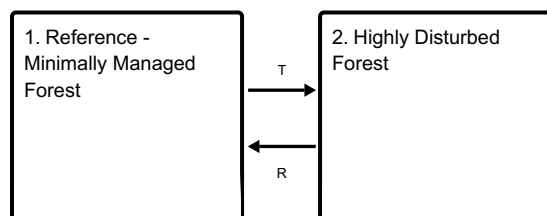
State 1 submodel, plant communities
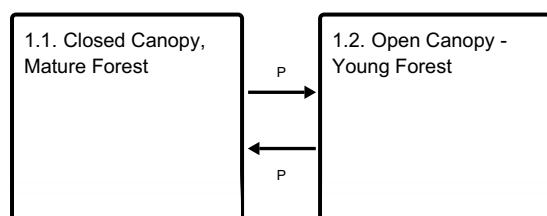
State 2 submodel, plant communities

2.1. Disturbed Forest

State 1
Reference - Minimally Managed Forest

Closed canopy mixed species swamps with a combination of red maple, hemlock, yellow birch, red spruce as common trees. Natural disturbances include wind-throw, insect damage, and weather fluctuations. These disturbances can create pockets of open canopies.

Resilience management. From NY Natural Heritage Program: Where practical, establish and maintain a natural wetland buffer to reduce storm-water, pollution, and nutrient run-off, while simultaneously capturing sediments before they reach the wetland. Buffer width should take into account the erodibility of the surrounding soils, slope steepness, and current land use. If possible, minimize the number and size of impervious surfaces in the surrounding landscape. Avoid habitat alteration within the wetland and surrounding landscape. For example, roads and trails should be routed around wetlands, and ideally should not pass through the buffer area. If the wetland must be crossed, then bridges and boardwalks are preferred over filling. Prevent the spread of invasive exotic species into the wetland through appropriate direct management, and by minimizing potential dispersal corridors, such as roads. When considering road construction and other development activities, minimize actions that will change what water carries and how water travels to this community, both on the surface and underground.

Community 1.1
Closed Canopy, Mature Forest

Closed canopy mixed species forest (red maple, hemlock, yellow birch, red spruce).

Community 1.2
Open Canopy - Young Forest

Pathway P
Community 1.1 to 1.2

Disturbance

Pathway P
Community 1.2 to 1.1

Time (succession).

State 2
Highly Disturbed Forest

A combination of hydrology alterations and disturbances (i.e roads, damns, drainage ditches, diversions) have affected species composition and may have introduced invasive species such as reedgrass, purple loosestrife, honeysuckles, etc. The state may also be secondary forest from timber harvest or abandoned land uses such as pasture or cropland.

Community 2.1
Disturbed Forest

Transition T

State 1 to 2

Timber harvest, hydrology alterations (roads, diversions, damns, ditches, drainageways, etc). Introduction of invasive species. Nutrient loading from development/roads.

Restoration pathway R
State 2 to 1

Restore ecological processes.

Conservation practices

Forest Stand Improvement
Restoration and Management of Natural Ecosystems
Forest Land Management
Herbaceous Weed Control

Additional community tables

Other references

Edinger, G. J., D. J. Evans, S. Gebauer, T. G. Howard, D. M. Hunt, and A. M. Olivero (editors). 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.

New York Natural Heritage Program. 2019. Online Conservation Guide for Hemlock-hardwood swamp. Available from: https://guides.nynhp.org/hemlock-hardwood-swamp/. Accessed September 3, 2019.

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	04/21/2020
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:**