

Ecological site F140XY001NY

Frigid Till Depressions

Last updated: 10/01/2024
Accessed: 10/30/2026

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 (USDA, 2006): Land Resource Region (LRR): L — Lake States Fruit, Truck Crop, and Dairy Region Major Land Resource Area (MLRA): 101— Ontario-Erie Plain and Finger Lakes Region USDA-FS (Cleland et al., 2007) Province: 211 — Northeastern Mixed Forest Province (in part) Section: 211F —Northern Glaciated Allegheny Plateau Subsection: 211Fa — Cattaraugus Highlands Subsection: 211Fb — Central Allegheny Plateau Subsection: 211Fc — Eastern Allegheny Plateau Subsection: 211Fd — Pocono Plateau Subsection: 211Ff — Glaciated High Plateau Section: 211I — Catskill Mountains Subsection: 211Ia — Catskill Mountains 211Ib — Catskill Highlands Province: 221 — Eastern Broadleaf Forest Province (in part) Section: 221B — Hudson Valley (in part) Subsection: 221Bd — Kittatinny-Shawangunk Ridges 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, Torull, Greenwood, and Wonsqueak. 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*).

Associated sites

F140XY012PA	Organic Wetlands
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Similar sites

F140XY016NY	Mineral Wetlands
F140XY011NY	Rich Organic Wetlands

Table 1. Dominant plant species

Tree	(1) <i>Tsuga canadensis</i> (2) <i>Acer rubrum</i>
Shrub	(1) <i>Vaccinium corymbosum</i> (2) <i>Rhododendron maximum</i>
Herbaceous	(1) <i>Osmunda cinnamomea</i> (2) <i>Carex trisperma</i>

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 (2) Bench (3) Backswamp (4) Swamp or marsh (5) Hillside or mountainside
Runoff class	Low to very high
Flooding frequency	None
Ponding frequency	None to frequent

Elevation	100 – 1,100 m
Slope	0 – 10 %
Water table depth	0 – 30 cm
Aspect	Aspect is not a significant factor

Climatic features

The Koppen-Geiger climate classification of the area in which this MLRA occurs is Dfb, Warm-summer humid continental. Rainfall occurs as high-intensity, convective thunderstorms in the summer. However, snow comprises most of the precipitation in this area. The frost-free period in this area averages 165 days and ranges from 130 to 200 days, with the coldest temperatures and the shortest frost-free periods occurring in the high-elevation areas in the eastern part of the MLRA.

Table 3 Representative climatic features

Frost-free period (characteristic range)	90-110 days
Freeze-free period (characteristic range)	120-140 days
Precipitation total (characteristic range)	970-1,300 mm
Frost-free period (actual range)	90-110 days
Freeze-free period (actual range)	120-140 days
Precipitation total (actual range)	970-1,520 mm
Frost-free period (average)	100 days
Freeze-free period (average)	130 days
Precipitation total (average)	1,170 mm

- (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

Poorly drained

Water is removed so slowly that the soil is wet at shallow depths periodically during the growing season or remains wet for long periods. Internal free water occurrence is shallow or very shallow and common or persistent. Free water is commonly at or near the surface long enough during the growing season that most mesophytic crops cannot be grown, unless the soil is artificially drained. The soil, however, is not continuously wet directly below plow depth. Free water at shallow depth is common. The water table is commonly the result of low or very low saturated hydraulic conductivity, nearly continuous rainfall, or a combination of these.

Very poorly drained

Water is removed from the soil so slowly that free water remains at or very near the surface during much of the growing season. Internal free water occurrence is very shallow and persistent or permanent. Unless the soil is artificially drained, most mesophytic crops cannot be grown. The soils are commonly level or depressed and frequently ponded. In areas where rainfall is high or nearly continuous, slope gradients may be greater.

Wetland description

The National Wetland Inventory classification (Cowardin et al., 1979) would specify:
Palustrine - Forested Mineral Soil Wetlands, class variable, leaf morphology variable, water regime variable, chemistry modifier variable.

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, Torull, Greenwood, and Wonsqueak.

Table 4. Representative soil features

Parent material	(1) Till – sandstone and shale (2) Till – siltstone (3) Organic material
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Surface texture	(1) Loam (2) Silt loam (3) Channery loam (4) Flaggy loam (5) Very stony loam (6) Channery silt loam (7) Flaggy silt loam (8) Stony silt loam (9) Very stony silt loam (10) Cobbly fine sandy loam (11) Fine sandy loam (12) Stony fine sandy loam (13) Gravelly silt loam (14) Gravelly loam (15) Extremely stony loam (16) Very stony sandy loam
Family particle size	(1) Fine-loamy (2) Coarse-loamy (3) Loamy
Drainage class	Very poorly drained to somewhat poorly drained
Permeability class	Very slow to moderately slow
Depth to restrictive layer	40 – 180 cm
Soil depth	40 – 180 cm
Surface fragment cover <=3"	Not specified
Surface fragment cover >3"	Not specified

Available water capacity (Depth not specified)	5.08 – 50.8 cm
Soil reaction (1:1 water) (Depth not specified)	3.5 – 8.4
Subsurface fragment volume <=3" (Depth not specified)	0 – 20 %
Subsurface fragment volume >3" (Depth not specified)	0 – 20 %

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

Additional community tables

Table 5. Community 1.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production ()	Foliar Cover (%)
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Table 6. Community 1.2 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production ()	Foliar Cover (%)
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Table 7. Community 2.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production ()	Foliar Cover (%)
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Table 8. Community 2.1 forest overstory composition

Common Name	Symbol	Scientific Name	Nativity	Height M	Canopy Cover (%)	Diameter Cm	Basal Area (square M/hectare)
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Table 9. Community 2.1 forest understory composition

Common Name	Symbol	Scientific Name	Nativity	Height (m)	Canopy Cover (%)
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Inventory data references

Future work is needed, as described in a future project plan, to validate the information presented in this provisional ecological site description. Future work includes field sampling, data collection and analysis by qualified vegetation ecologists and soil scientists. As warranted, annual reviews of the project plan can be conducted by the Ecological Site Technical Team. A final field review, peer review,

quality control, and quality assurance reviews of the ESD are necessary to approve a final document.

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.

Contributors

Joshua Hibit

Approval

Greg Schmidt, 10/01/2024

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	
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:
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17. Perennial plant reproductive capability:
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