

Ecological site F140XY010NY

Frigid Moist Till Uplands

Last updated: 10/01/2024
Accessed: 09/24/2026

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: 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

Ecological site concept

Landform/Landscape Position: The site occurs on bedrock controlled benches, steps, and footslopes. Slopes are mostly under 20% but can range up to 50%. Soils: The soils consists of very deep to moderately deep, moderately well to somewhat 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 Ischua, Gretor, Salamanca, Middlebrook, Hornellsville, and Almond. Vegetation: Reference community is a red maple-red oak-beech dominant hardwood Forest along wetland margins. 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*)

Associated sites

F140XY008NY	Frigid Steep Till Uplands
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F140XY009NY	Frigid Till Uplands
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Similar sites

F140XY004NY	Frigid Shallow Moist Till
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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 bedrock controlled benches, steps, and footslopes. Slopes range from 0-5%

Table 2. Representative physiographic features

Landforms	(1) Mountains > Bench (2) Upland > Hill (3) Mountain (4) Ridge (5) Till plain
Runoff class	Medium to very high
Flooding frequency	None
Ponding frequency	None
Elevation	240 – 1,100 m
Slope	0 – 50 %
Water table depth	20 – 50 cm

Aspect	Aspect is not a significant factor
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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-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

Soil features

The soils consists of very deep to moderately deep, moderately well to somewhat 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 Empeyville, Ishua, Gretor, Salamanca, Middlebrook, Hornellsville, and Almond.

Table 4. Representative soil features

Parent material	(1) Till – sandstone and shale (2) Till – siltstone (3) Residuum
Surface texture	(1) Loam (2) Channery loam (3) Channery silt loam (4) Silt loam (5) Extremely stony sandy loam
Family particle size	(1) Coarse-loamy (2) Loamy (3) Fine-loamy (4) Loamy-skeletal
Drainage class	Somewhat poorly drained to moderately well drained
Permeability class	Very slow
Depth to restrictive layer	60 – 180 cm
Surface fragment cover <=3"	Not specified
Surface fragment cover >3"	0 – 10 %
Available water capacity (Depth not specified)	7.62 – 17.78 cm
Soil reaction (1:1 water) (Depth not specified)	3.5 – 7.3
Subsurface fragment volume <=3" (Depth not specified)	0 – 20 %

Subsurface fragment volume >3" (Depth not specified)	0 – 60 %
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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

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)
Tree							
northern red oak	QURU	<i>Quercus rubra</i>	Native	–	–	–	–
sugar maple	ACSA3	<i>Acer saccharum</i>	Native	–	–	–	–
black cherry	PRSE2	<i>Prunus serotina</i>	Native	–	–	–	–
hophornbeam	OSVI	<i>Ostrya virginiana</i>	Native	–	–	–	–
American beech	FAGR	<i>Fagus grandifolia</i>	Native	–	–	–	–
green ash	FRPE	<i>Fraxinus pennsylvanica</i>	Native	–	–	–	–
red maple	ACRU	<i>Acer rubrum</i>	Native	–	–	–	–
sweet birch	BELE	<i>Betula lenta</i>	Native	–	–	–	–
white oak	QUAL	<i>Quercus alba</i>	Native	–	–	–	–
black oak	QUVE	<i>Quercus velutina</i>	Native	–	–	–	–

Table 9. Community 2.1 forest understory composition

Common Name	Symbol	Scientific Name	Nativity	Height (m)	Canopy Cover (%)
Grass/grass-like (Graminoids)					
sedge	CAREX	<i>Carex</i>	Unknown	–	–
quackgrass	ELRE4	<i>Elymus repens</i>	Introduced	–	–

drooping sedge	CAPR12	<i>Carex prasina</i>	Native	–	–
rough bluegrass	POTR2	<i>Poa trivialis</i>	Introduced	–	–
poverty dropseed	SPVA	<i>Sporobolus vaginiflorus</i>	Native	–	–
hairy wildrye	ELVI	<i>Elymus villosus</i>	Native	–	–
Kentucky bluegrass	POPR	<i>Poa pratensis</i>	Native	–	–
Forb/Herb					
eastern daisy fleabane	ERAN	<i>Erigeron annuus</i>	Native	–	–
orange hawkweed	HIAU	<i>Hieracium aurantiacum</i>	Introduced	–	–
common yellow oxalis	OXST	<i>Oxalis stricta</i>	Native	–	–
common cinquefoil	POSI2	<i>Potentilla simplex</i>	Native	–	–
goldenrod	SOLID	<i>Solidago</i>	Unknown	–	–
Indian cucumber	MEVI	<i>Medeola virginiana</i>	Native	–	–
partridgeberry	MIRE	<i>Mitchella repens</i>	Native	–	–
Jack in the pulpit	ARTR	<i>Arisaema triphyllum</i>	Native	–	–
green false hellebore	VEVI	<i>Veratrum viride</i>	Native	–	–
buttercup	RANUN	<i>Ranunculus</i>	Unknown	–	–
stickywilly	GAAP2	<i>Galium aparine</i>	Native	–	–
feathery false lily of the valley	MARA7	<i>Maianthemum racemosum</i>	Native	–	–
dogtooth violet	ERAM5	<i>Erythronium americanum</i>	Native	–	–
mayapple	POPE	<i>Podophyllum peltatum</i>	Native	–	–
starflower	TRBO2	<i>Trientalis borealis</i>	Native	–	–
garlic mustard	ALPE4	<i>Alliaria petiolata</i>	Introduced	–	–
crinkleroot	CADI10	<i>Cardamine diphylla</i>	Native	–	–
spotted geranium	GEMA	<i>Geranium maculatum</i>	Native	–	–
Virginia strawberry	FRVI	<i>Fragaria virginiana</i>	Native	–	–
Canada mayflower	MACA4	<i>Maianthemum canadense</i>	Native	–	–
wild sarsaparilla	ARNU2	<i>Aralia nudicaulis</i>	Native	–	–
Fern/fern ally					
rare clubmoss	LYOB	<i>Lycopodium obscurum</i>	Native	–	–
intermediate woodfern	DRIN5	<i>Dryopteris intermedia</i>	Native	–	–
Christmas fern	POAC4	<i>Polystichum acrostichoides</i>	Native	–	–
New York fern	THNO	<i>Thelypteris noveboracensis</i>	Native	–	–
running clubmoss	LYCL	<i>Lycopodium clavatum</i>	Native	–	–
eastern hayscented fern	DEPU2	<i>Dennstaedtia punctilobula</i>	Native	–	–
sensitive fern	ONSE	<i>Onoclea sensibilis</i>	Native	–	–
Shrub/Subshrub					
mapleleaf viburnum	VIAC	<i>Viburnum acerifolium</i>	Native	–	–
Morrow's honeysuckle	LOMO2	<i>Lonicera morrowii</i>	Introduced	–	–
multiflora rose	ROMU	<i>Rosa multiflora</i>	Introduced	–	–
autumn olive	ELUM	<i>Elaeagnus umbellata</i>	Introduced	–	–
Allegheny blackberry	RUAL	<i>Rubus allegheniensis</i>	Native	–	–
blackberry	RUBUS	<i>Rubus</i>	Unknown	–	–
eastern prickly gooseberry	RICY	<i>Ribes cynosbati</i>	Native	–	–
Japanese barberry	BETH	<i>Berberis thunbergii</i>	Introduced	–	–
blue cohosh	CATH2	<i>Caulophyllum thalictroides</i>	Native	–	–
Tree					

northern red oak	QURU	<i>Quercus rubra</i>	Native	–	–
American beech	FAGR	<i>Fagus grandifolia</i>	Native	–	–
hybrid hickory	CARYA	<i>Carya</i>	Unknown	–	–
white oak	QUAL	<i>Quercus alba</i>	Native	–	–
Schuette's hawthorn	CRSC4	<i>Crataegus schuettei</i>	Native	–	–
common buckthorn	RHCA3	<i>Rhamnus cathartica</i>	Introduced	–	–
Norway spruce	PIAB	<i>Picea abies</i>	Introduced	–	–
black cherry	PRSE2	<i>Prunus serotina</i>	Native	–	–
sugar maple	ACSA3	<i>Acer saccharum</i>	Native	–	–
green ash	FRPE	<i>Fraxinus pennsylvanica</i>	Native	–	–
shagbark hickory	CAOV2	<i>Carya ovata</i>	Native	–	–
red maple	ACRU	<i>Acer rubrum</i>	Native	–	–
sweet birch	BELE	<i>Betula lenta</i>	Native	–	–
Norway spruce	PIAB	<i>Picea abies</i>	Introduced	–	–
tamarack	LALA	<i>Larix laricina</i>	Native	–	–
eastern white pine	PIST	<i>Pinus strobus</i>	Native	–	–
hophornbeam	OSVI	<i>Ostrya virginiana</i>	Native	–	–
black oak	QUVE	<i>Quercus velutina</i>	Native	–	–
eastern cottonwood	PODE3	<i>Populus deltoides</i>	Native	–	–
American witchhazel	HAVI4	<i>Hamamelis virginiana</i>	Native	–	–
Vine/Liana					
smooth carrionflower	SMHE	<i>Smilax herbacea</i>	Native	–	–

Table 10. Community 2.2 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production ()	Foliar Cover (%)
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Table 11. Community 3.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production ()	Foliar Cover (%)
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Table 12. Community 3.2 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production ()	Foliar Cover (%)
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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

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

Contributors

Joshua Hibit

Approval

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	05/20/2020
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:

17. Perennial plant reproductive capability:
