

Ecological site F140XY023NY

Shallow Till Uplands

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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

Ecological site concept

Landform/Landscape Position:

The site occurs on hills, ridges, benches, and ground moraines. Slopes range from 0 to 80 percent.

Soils:

The site consists of shallow, well drained to somewhat excessively drained, gravelly, loamy soils that formed in glacial till derived mostly from acid sandstone, siltstone, shale, and conglomerates. Representative soil is Arnot.

Vegetation:

The reference plant community is an oak dominated forest. In some places the canopy may be more open forming a woodland. Black oak and chestnut are common trees in association with scarlet oak, red oak, pignut hickory, white

ash, eastern white pine, and eastern hemlock. Common shrubs include black huckleberry and lowbush blueberry.

Table 1. Dominant plant species

Tree	(1) <i>Quercus velutina</i> (2) <i>Quercus montana</i>
Shrub	(1) <i>Vaccinium angustifolium</i> (2) <i>Gaylussacia baccata</i>
Herbaceous	(1) <i>Carex pensylvanica</i>

Physiographic features

The site occurs on hills, ridges, benches, and ground moraines. Slopes range from 0 to 80 percent.

Table 2. Representative physiographic features

Landforms	(1) Hill (2) Bench (3) Ridge (4) Ground moraine
Runoff class	Medium to very high
Slope	0–80%

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

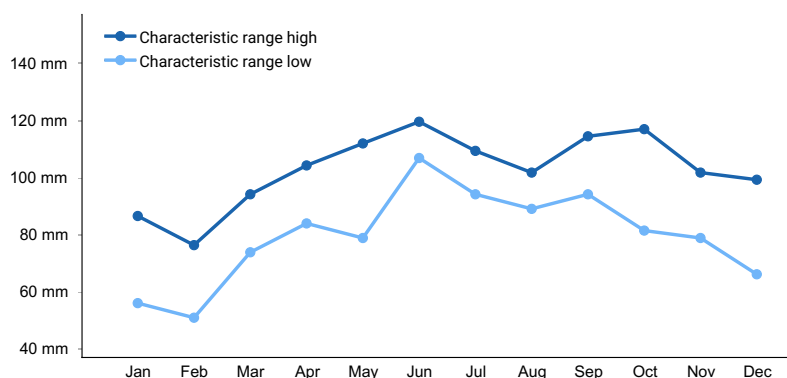


Figure 1. Monthly precipitation range

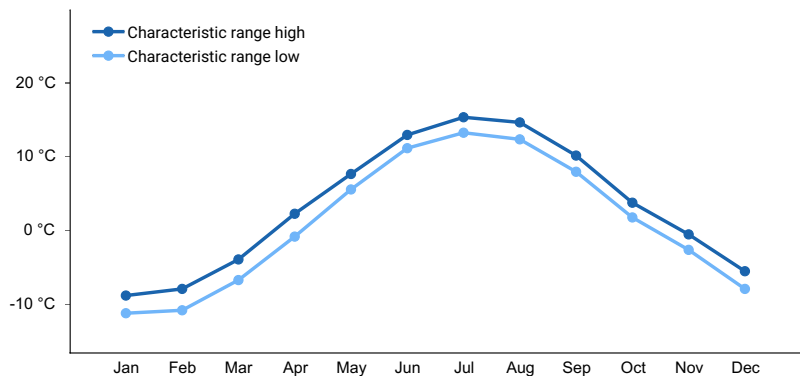


Figure 2. Monthly minimum temperature range

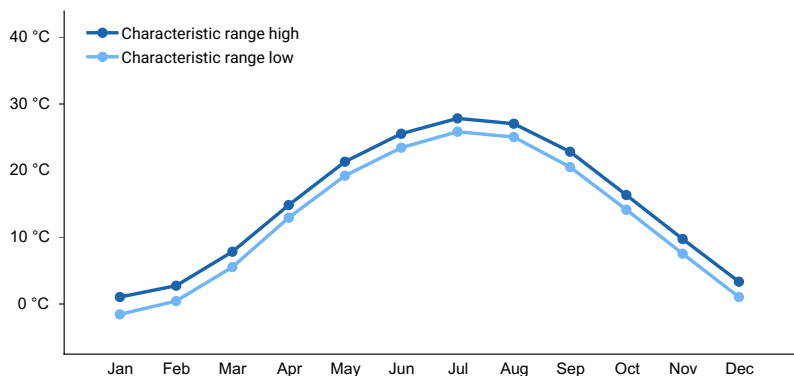


Figure 3. Monthly maximum temperature range

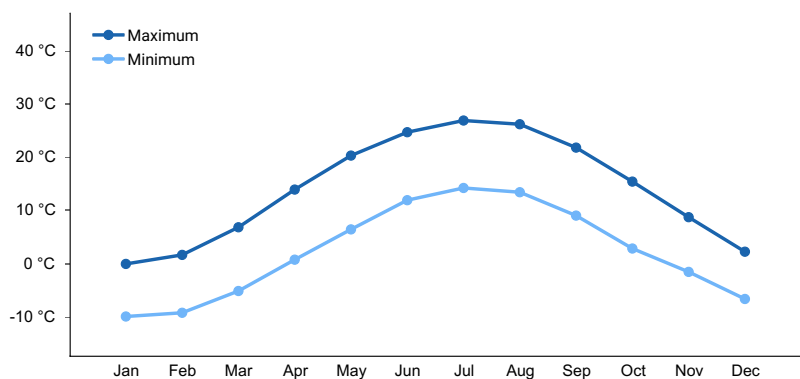


Figure 4. Monthly average minimum and maximum temperature

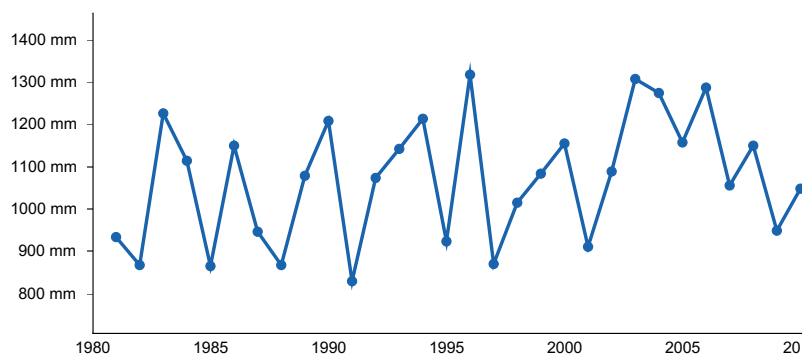


Figure 5. Annual precipitation pattern

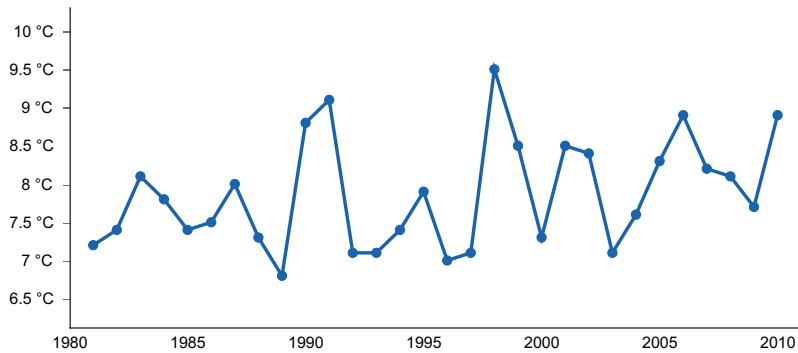


Figure 6. Annual average temperature pattern

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 site consists of shallow, well drained to somewhat excessively drained, gravelly, loamy soils that formed in glacial till derived mostly from acid sandstone, siltstone, shale, and conglomerates. Representative soil is Arnot.

Table 4. Representative soil features

Parent material	(1) Till–sandstone (2) Till–siltstone (3) Till–shale (4) Till–conglomerate
Family particle size	(1) Loamy-skeletal
Drainage class	Well drained to somewhat excessively drained
Soil depth	30–48 cm
Surface fragment cover >3"	0–25%
Soil reaction (1:1 water) (Depth not specified)	3.5–6
Subsurface fragment volume <=3" (Depth not specified)	15–40%
Subsurface fragment volume >3" (Depth not specified)	10–40%

Table 5. Representative soil features (actual values)

Drainage class	Not specified
Soil depth	Not specified
Surface fragment cover >3"	0–40%
Soil reaction (1:1 water) (Depth not specified)	Not specified

Subsurface fragment volume <=3" (Depth not specified)	Not specified
Subsurface fragment volume >3" (Depth not specified)	Not specified

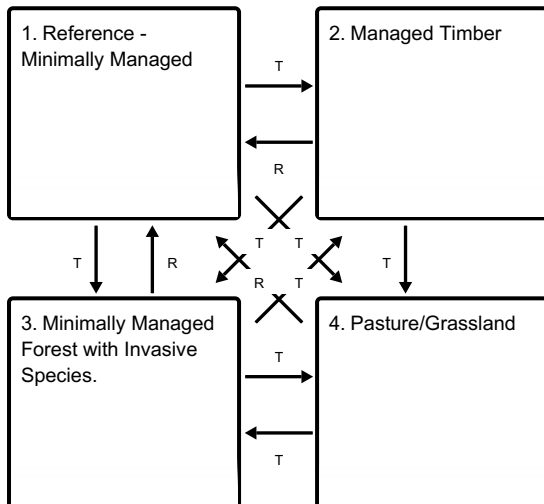
Ecological dynamics

The reference plant community is an oak dominated forest. In some places the canopy may be more open forming a woodland. Black oak and chestnut are common trees in association with scarlet oak, red oak, pignut hickory, white ash, eastern white pine, and eastern hemlock. Trees are generally lower in stature and productivity relative to forests in deeper soils. Lowbush blueberry and black huckleberry are common shrubs. Spotted wintergreen and Pennsylvania sedge are common understory species.

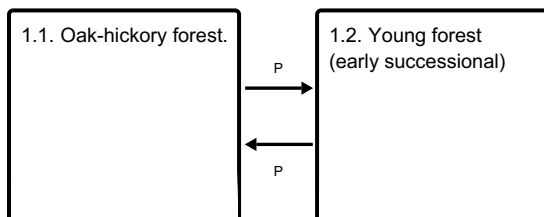
In openings following tree falls or other natural disturbances poverty oatgrass and little bluestem may occur with early successional trees such as black birch. Invasive exotic plants such as Japanese barberry, multiflora rose, winged euonymus, and shrub honeysuckles can occur in disturbed sites. pitch pine, sassafras, black birch, American beech, witch-hazel, black huckleberry, lowbush blueberry, maple-leaved viburnum, and Pennsylvania sedge.

State and transition model

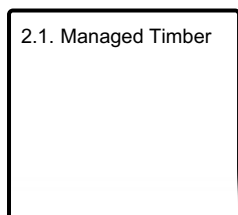
Ecosystem states



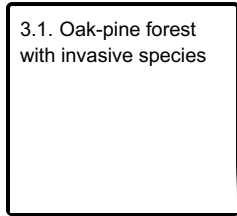
State 1 submodel, plant communities



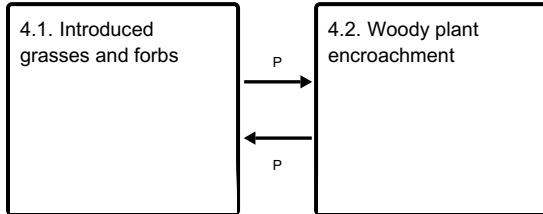
State 2 submodel, plant communities



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-hickory forest.

The reference plant community is an oak dominated forest. In some places the canopy may be more open forming a woodland. Black oak and chestnut are common trees in association with scarlet oak, red oak, pignut hickory, white ash, eastern white pine, eastern hemlock, and in some locations pitch pine. Trees are generally lower in stature and productivity relative to forests in deeper soils. Lowbush blueberry and black huckleberry are common shrubs. Spotted wintergreen and Pennsylvania sedge are common understory species. In openings following tree falls or other natural disturbances poverty oatgrass and little bluestem may occur with early successional trees such as black birch

Community 1.2

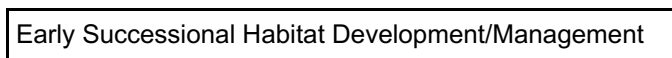
Young forest (early successional)

Pathway P

Community 1.1 to 1.2

Natural disturbances - wind/ice storm, tree fall, and insect damage.

Conservation practices



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

Transition T State 1 to 2

Logging, timber harvest.

Transition T State 1 to 3

Introduction of invasive species, typically following a disturbance.

Transition T State 1 to 4

Land use conversion

Restoration pathway R
State 2 to 1

Stand improvement, time (succession).

Conservation practices

Forest Stand Improvement

Transition T
State 2 to 3

Abandonment, introduction of invasive species.

Transition T
State 2 to 4

Land use conversion.

Restoration pathway R
State 3 to 1

Invasive species removal/control.

Conservation practices

Brush Management
Invasive Plant Species Control
Invasive Species Pest Management
Biological suppression and other non-chemical techniques to manage brush, weeds and invasive species

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

Time (succession). Forest restoration.

Conservation practices

Native Plant Community Restoration and Management

Transition T
State 4 to 3

Abandonment, time (succession).

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

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.

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	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:**
