USDA Natural Resources Conservation Service

Ecological site F101XY006NY
Moist Outwash

Last updated: 10/03/2024
Accessed: 04/23/2025

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): 101X–Ontario-Erie Plain and Finger Lakes Region

Most of the MLRA is a nearly level to rolling plain. Low remnant beach ridges are commonly interspersed with a relatively level lake plain in the northern part of the area. Drumlins (long, narrow, steep-sided, cigar shaped hills) are prominent in an east-west belt in the center of the area. The Finger Lakes Region consists of a gently sloping to rolling till plain. Elevation increases gradually from the shores of Lake Ontario and Lake Oneida to the Allegheny Plateau, the southern border of the area. The bedrock underlying this area consists of alternating beds of limestone, dolomite, sandstone, and shale of Ordovician to Devonian age. Most of the surface of the area is covered with glacial till or lake sediments. The texture of the lake sediments is silt, loam, or sand. Ancient beaches, formed at different lake levels, form ridges along the shoreline of Lake Erie and Lake Ontario. Stratified drift (eskers and kames) and glacial outwash deposits are in many of the valleys. A large drumlin field occurs in the Finger Lakes Region.

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: 211J — Mohawk Valley (in part)
Subsection: 211Jd — Mohawk Valley
Province: 222 — Midwest Broadleaf Forest Province (in part)
Section: 222I — Erie and Ontario Lake Plain
Subsection: 222Ia — Lake Erie Plain
222Ib — Erie-Ontario Lake Plain
222Ic — Eastern Ontario Till Plain
222Id — Cattaraugus Finger Lakes Moraine and Hills
222Ie — Eastern Ontario Lake Plain

Ecological site concept

Landform/Landscape Position:
The site occurs outwash plains, terraces, kames, deltas, and beach ridges. Slopes range from 0 to 15 percent.

Soils:
The site consists of very deep, moderately well drained or somewhat poorly drained soils formed in glacial outwash deposits. Soils are typically moderately coarse to coarse textured. Representative soils are Altmar, Claverack, Cosad, Croghan, Elnora, Farnham, Fredon, Galen, Herkimer, Homer, Junius, Minoa, Phelps, Scio, Stafford, Swormville, and Wareham mapped within MLRA 101.

Vegetation
The reference community coincides with NY natural heritage community: Maple-basswood rich mesic forest.

Associated sites

F101XY007NY	**Wet Outwash** Wet Outwash sites are lower in the landscape profile.
F101XY005NY	**Dry Outwash** Dry Outwash sites are higher in the landscape profile.

Similar sites

F101XY009NY	**Moist Lake Plain** Moist Lake Plain sites may be better enriched.
F101XY013NY	**Moist Till** Moist Till sites may be better enriched.

Table 1. Dominant plant species

Tree	(1) *Acer saccharum* (2) *Quercus rubra*
Shrub	(1) *Hamamelis virginiana* (2) *Lindera benzoin*
Herbaceous	(1) *Dryopteris marginalis*

Physiographic features

The site occurs outwash plains, terraces, kames, deltas, and beach ridges. Slopes range from 0 to 15 percent.

Table 2. Representative physiographic features

Landforms	(1) Lake plain > Outwash plain (2) Outwash plain > Outwash terrace (3) Kame (4) Delta (5) Beach ridge (6) Terrace (7) Lake plain (8) Longshore bar (relict) (9) Alluvial fan (10) Valley train (11) Depression
Runoff class	Very low to very high
Flooding frequency	None to rare
Ponding frequency	None
Elevation	15–600 m
Slope	0–15%
Water table depth	20–183 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-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)	136-140 days
Freeze-free period (characteristic range)	173-186 days
Precipitation total (characteristic range)	940-1,067 mm
Frost-free period (actual range)	135-140 days
Freeze-free period (actual range)	167-187 days
Precipitation total (actual range)	889-1,067 mm
Frost-free period (average)	138 days
Freeze-free period (average)	179 days
Precipitation total (average)	991 mm

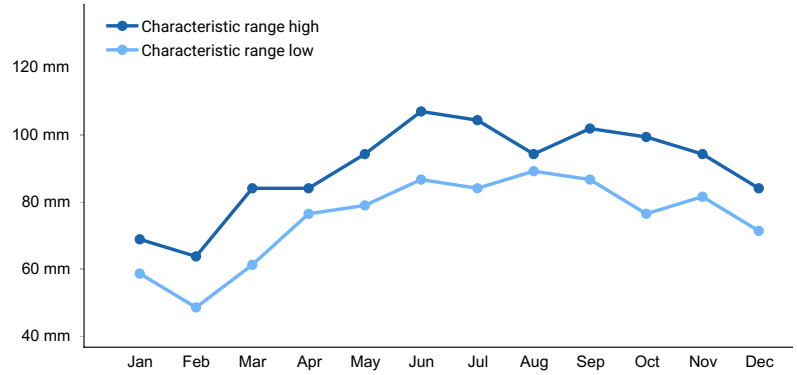


Figure 1. Monthly precipitation range

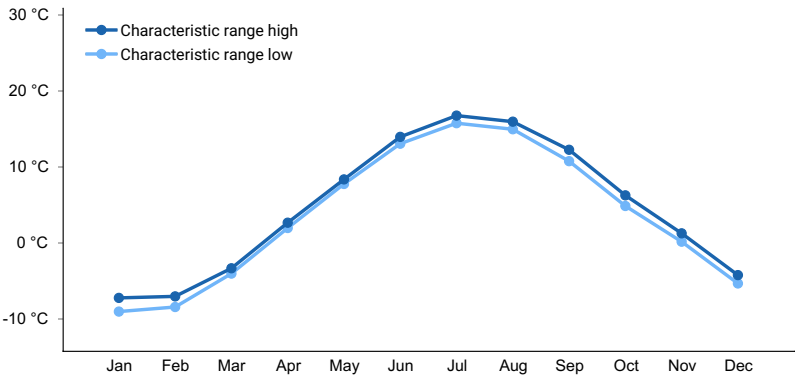


Figure 2. Monthly minimum temperature range

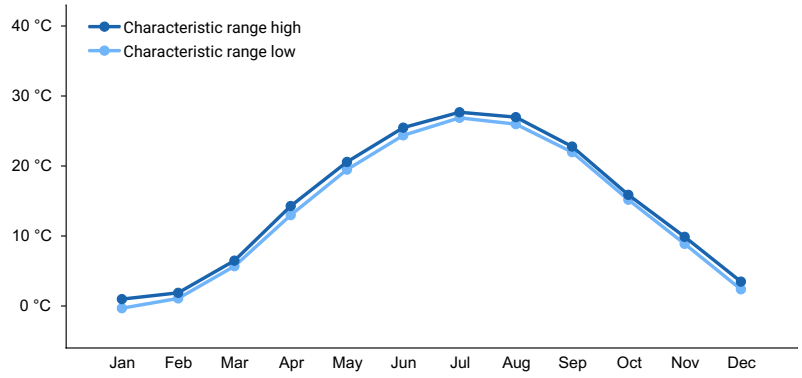


Figure 3. Monthly maximum temperature range

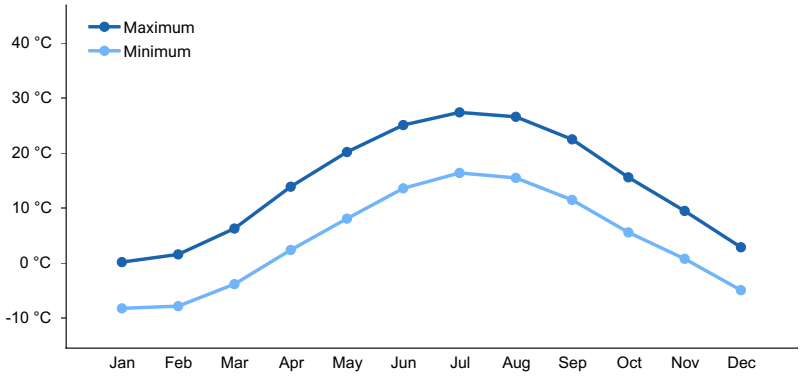


Figure 4. Monthly average minimum and maximum temperature

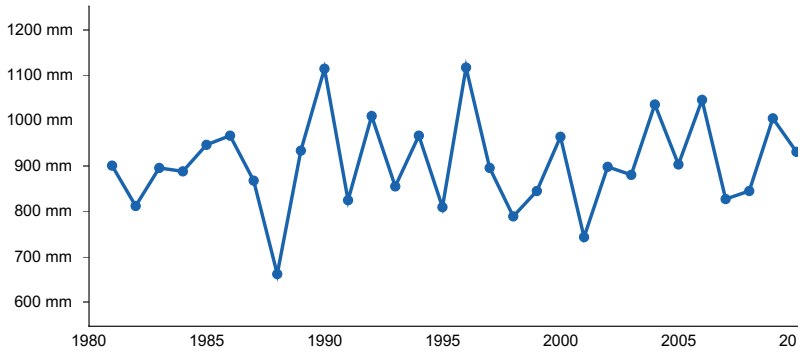


Figure 5. Annual precipitation pattern

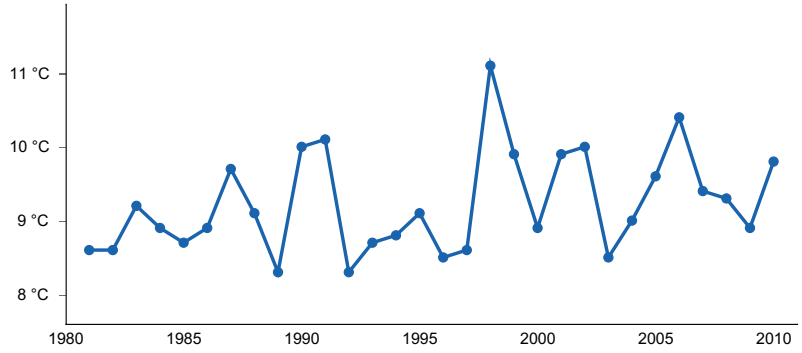


Figure 6. Annual average temperature pattern

Climate stations used

- (1) SUNY ESF SYRACUSE [USC00308386], Syracuse, NY
- (2) DELANSON 2NE [USC00302031], Delanson, NY
- (3) ROCHESTER GTR INTL AP [USW00014768], Rochester, NY

- (4) DUNKIRK CHAUTAUQUA AP [USW00014747], Dunkirk, NY
- (5) LOCKPORT 3 S [USC00304844], Lockport, 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.

Wetland description

National Wetland Classification (Cowardin et al., 1979):

Palustrine, class variable, leaf morphology variable, water regime variable, chemistry modifier variable.

Soil features

The site consists of very deep, moderately well drained or somewhat poorly drained soils formed in glacial outwash deposits. Soils are typically moderately coarse to coarse textured. Representative soils are Altmar, Covert, Claverack, Cosad, Croghan, Elnora, Farnham, Fredon, Galen, Herkimer, Homer, Junius, Minoa, Phelps, Scio, Stafford, Swormville, and Wareham mapped within MLRA 101.

Table 4. Representative soil features

Parent material	(1) Glaciofluvial deposits–limestone, sandstone, and shale (2) Eolian deposits (3) Glaciolacustrine deposits (4) Alluvium
Surface texture	(1) Gravelly fine sandy loam (2) Silt loam (3) Channery silt loam (4) Gravelly loam (5) Fine sandy loam (6) Very fine sandy loam (7) Fine sand (8) Gravelly silt loam
Family particle size	(1) Sandy (2) Loamy-skeletal (3) Coarse-loamy (4) Coarse-loamy over sandy or sandy-skeletal (5) Fine-loamy over sandy or sandy-skeletal (6) Fine-silty over clayey (7) Fine-silty over sandy or sandy-skeletal (8) Sandy over clayey
Drainage class	Poorly drained to well drained
Permeability class	Very slow to moderately rapid
Depth to restrictive layer	61–183 cm
Surface fragment cover <=3"	0%
Surface fragment cover >3"	0%
Available water capacity (Depth not specified)	5.08–17.78 cm
Soil reaction (1:1 water) (Depth not specified)	3.5–8.4

Subsurface fragment volume <=3" (Depth not specified)	0–50%
Subsurface fragment volume >3" (Depth not specified)	0–25%

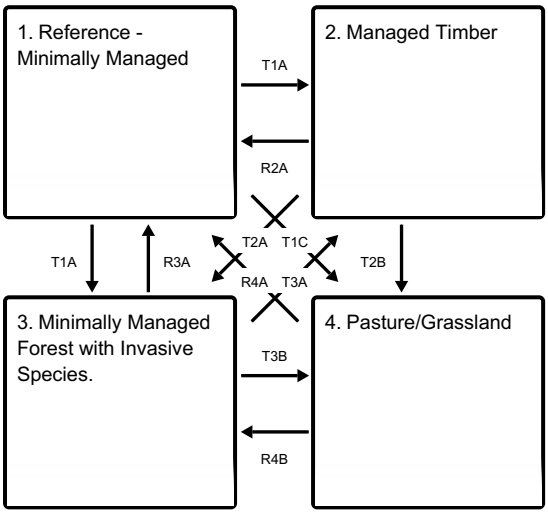
Ecological dynamics

The reference coincides with Maple-Basswood Rich Mesic Forest (NY Natural Heritage Program) and International Vegetation Classification Sugar Maple – American Basswood / Blue Cohosh Forest
Acer saccharum – *Tilia americana* / *Caulophyllum thalictroides* Forest (CEGL006637)

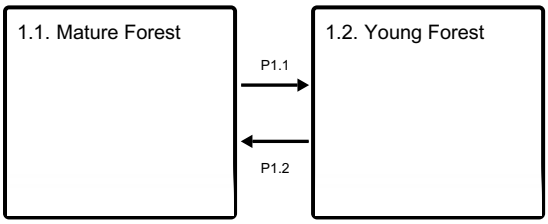
Common trees are sugar maple, northern red oak, basswood, yellow birch, white ash, and hop hornbeam. Shrubs include witch-hazel and dogwood. Dynamics includes conversion of site into agricultural production and invasive species establishment. Disturbances include wind, ice, insects, and land clearing or timber harvest.

State and transition model

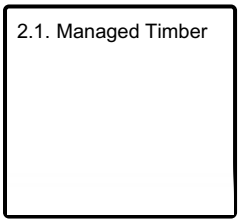
Ecosystem states



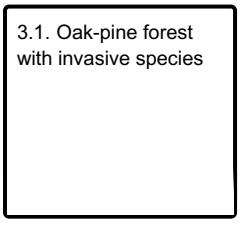
State 1 submodel, plant communities



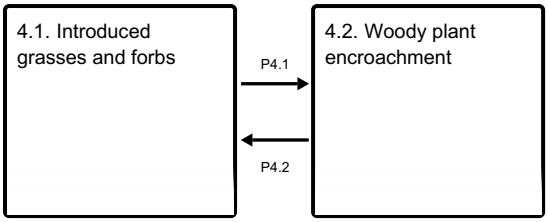
State 2 submodel, plant communities



State 3 submodel, plant communities



State 4 submodel, plant communities



State 1
Reference - Minimally Managed

Reference is Maple-basswood rich mesic forest. Natural disturbances such and 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
Mature Forest

Mature, late successional closed canopy forest. The reference community coincides with NY natural heritage community: Rich mesophytic forest.

Community 1.2
Young Forest

Open canopy, early successional, young forest.

Pathway P1.1
Community 1.1 to 1.2

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

Conservation practices

Early Successional Habitat Development/Management

Pathway P1.2
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 P4.1
Community 4.1 to 4.2

Abandonment (lack of mowing or fire suppression)

Pathway P4.2
Community 4.2 to 4.1

Mowing, prescribed fire, and/or brush management.

Conservation practices

Brush Management

Transition T1A
State 1 to 2

Timber harvest; logging.

Transition T1A
State 1 to 3

Introduction of invasive species usually after disturbance.

Transition T1C
State 1 to 4

Land use conversion.

Restoration pathway R2A
State 2 to 1

Time (succession). Forest stand improvement, restoration.

Transition T2A
State 2 to 3

Introduction of invasive species. Lack of timber management.

Transition T2B
State 2 to 4

Land use conversion

Restoration pathway R3A
State 3 to 1

Brush management, invasive species management.

Transition T3A
State 3 to 2

Timber management/harvest, logging.

Transition T3B
State 3 to 4

Land use conversion.

Restoration pathway R4A
State 4 to 1

Abandonment, Time (succession), forest restoration.

Restoration pathway R4B
State 4 to 3

Abandonment, time (sucession) and introduction of invasive species.

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

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Contributors

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Approval

Greg Schmidt, 10/03/2024

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	05/21/2020
Approved by	Greg Schmidt
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:**

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7. **Amount of litter movement (describe size and distance expected to travel):**

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8. **Soil surface (top few mm) resistance to erosion (stability values are averages - most sites will show a range of values):**

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9. **Soil surface structure and SOM content (include type of structure and A-horizon color and thickness):**

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10. **Effect of community phase composition (relative proportion of different functional groups) and spatial distribution on infiltration and runoff:**

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11. **Presence and thickness of compaction layer (usually none; describe soil profile features which may be mistaken for compaction on this site):**

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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:

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13. **Amount of plant mortality and decadence (include which functional groups are expected to show mortality or decadence):**

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14. **Average percent litter cover (%) and depth (in):**

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15. **Expected annual annual-production (this is TOTAL above-ground annual-production, not just forage annual-production):**

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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:**
