Ecological site F142XA019NY
Acidic Moist Till
Frigid

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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): 142X–St. Lawrence-Champlain Plain

This MLRA is a glaciated area of low relief dominated by broad expanses of nearly level, sandy deltas and shallow lacustrine basins or plains punctuated by low hills of glacial till. Rivers and streams have cut relatively deep but narrow valleys across the plain. Elevation ranges from 80 to 1,000 feet, increasing gradually from the St. Lawrence River southward and from Lake Champlain to the east and west. Local relief generally is less than 30 feet, but glacial till ridges, till plains, and some outwash terraces rise 15 to 80 feet above the adjacent plains. This area has been glaciated, and a thin mantle of till covers most of the bedrock. Extensive areas of sandy glacial outwash and eolian deposits also occur. Some glacial lake sediments have been deposited above glacial moraines. These deposits are thickest in the valleys and thinnest on the ridges and highlands. During the later stages of the Wisconsin glacial period, seawater entered the Champlain Valley and deposited marine sediments that were later covered by freshwater sediments. The marine deposits are unique to the area. This area supports hardwoods. The beech-birch-sugar maple forest type is the dominant climax forest type on uplands. Associated with this type are basswood, American elm, maple species, white ash, black cherry, and white pine. The aspen-birch type, earlier in succession, is economically important. Such species as eastern hemlock, red maple, American elm, and spruce are on wet soils. Some of the major wildlife species in this area are white-tailed deer, red fox, raccoon, beaver, woodchuck, muskrat, cottontail, ruffed grouse, and woodcock.

LRU notes

Land Resource Unit (LRU): Frigid Soil Temperature Regime The upper St. Lawrence and Champlain Valleys are characterized with soils in the frigid soil temperature regime (mean annual soil temperature greater than 32°F but less than 46°F and with a difference between mean summer and mean winter soil temperatures greater than 41°F at 20 inches below the surface or at a densic, lithic, or paralithic contact, whichever is shallower). The Frigid Soil Temperature Regime (STR) will have shorter growing season than the lower St. Lawrence and Champlain Valleys which are characterized with soils in the mesic STR. Species more tolerant of colder year round temperatures would also be evident in the Frigid LRU.

Classification relationships

NRCS: Land Resource Region: R - Northeastern Forage and Forest Region MLRA: 142 - St. Lawrence-Champlain Plain LRU: A/02 - Frigid Mean Annual Soil Temperature USFS: Domain: 200 - Humid Temperate Division: 210 - Warm Continental Province: 211 - Northeastern Mixed Forest Section: 211E - St. Lawrence and Champlain Valley Subsections: 211Ea - St. Lawrence Glacial Marine Plain EPA: Level I: 8 - Eastern Temperate Forests Level II: 8.1 - Mixed Wood Plains Level III: 83 - Eastern Great Lakes Lowlands Level IV: 83d - St. Lawrence Lowlands 83e - Upper St. Lawrence Valley

Ecological site concept

Landform/Landscape Position: The site occurs on till plains, hills, ridges, benches. Slopes range from 0 to 15 percent. Soils: The site consists of moderately deep and very deep, moderately well drained and somewhat poorly drained coarse-loamy soils that formed in glacial till derived mainly from sandstone and crystalline rock. Soils have an acidic base status throughout. Representative soils are Chazy, Moira, Schroon, and Topknot. Vegetation: Based on existing information and known soil/vegetation relationships of the area, the reference plant community is considered to be a Hemlock-Northern Hardwood (Edinger et al. 2014).

Associated sites

F142XB019NY	Shallow Acidic Till Upland
F142XB021NY	Acidic Wet Till Depression

Similar sites

F142XA015NY	Shallow Acidic Till Upland Frigid
F142XA020NY	Rich Moist Till Frigid
F142XA007NY	Rich Moist Outwash Frigid

Table 1. Dominant plant species

Tree	(1) *Tsuga canadensis* (2) *Acer saccharum*
Shrub	(1) *Rhododendron maximum* (2) *Viburnum acerifolium*
Herbaceous	(1) *Dryopteris intermedia* (2) *Huperzia lucidula*

Physiographic features

The site occurs on till plains, hills, ridges, benches. Slopes range from 0 to 15 percent.

Table 2. Representative physiographic features

Landforms	(1) Lake plain > Till plain (2) Mountain range > Bench (3) Upland > Hill (4) Till plain > Ridge (5) Drumlinoid ridge (6) Mountain (7) Hillside or mountainside (8) Low hill (9) Moraine (10) Valley side
Runoff class	Low to high
Flooding frequency	None
Ponding frequency	None
Elevation	20 – 1,070 m
Slope	0 – 70 %
Water table depth	30 – 180 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, and snowfall is heavy from late in Autumn to early Spring. The frost-free period in this area is longest in a narrow belt around Lake Champlain.

Table 3 Representative climatic features

Frost-free period (characteristic range)	120-130 days
Freeze-free period (characteristic range)	150-160 days
Precipitation total (characteristic range)	860-970 mm

Frost-free period (actual range)	120-140 days
Freeze-free period (actual range)	150-170 days
Precipitation total (actual range)	840-990 mm
Frost-free period (average)	130 days
Freeze-free period (average)	160 days
Precipitation total (average)	910 mm

- (1) OGDENSBURG 4 NE [USC00306164], Ogdensburg, NY
- (2) MASSENA INTL AP [USW00094725], Massena, NY
- (3) LAWRENCEVILLE 3 SW [USC00304647], Nicholville, NY
- (4) MALONE [USC00304996], Malone, NY
- (5) PLATTSBURGH AFB [USC00306659], Plattsburgh, NY

Influencing water features

NONE

Wetland description

NONE

Soil features

The site consists of moderately deep and very deep, moderately well drained and somewhat poorly drained coarse-loamy soils that formed in glacial till derived mainly from sandstone and crystalline rock. Soils have an acidic base status throughout. Representative soils are Chazy, Moira, Schroon, Topknot, Millsite, Monadnock, Parishville, Rawsonville, Skerry, Sunapee, Tunbridge, Westbury, and Worth.

Table 4. Representative soil features

Parent material	(1) Till – sandstone (2) Granite and gneiss (3) Siltstone (4) Igneous rock (5) Sedimentary rock

Surface texture	(1) Stony loam (2) Very stony loam (3) Fine sandy loam (4) Loam (5) Very stony very fine sandy loam (6) Stony very fine sandy loam (7) Stony fine sandy loam (8) Very fine sandy loam
Family particle size	(1) Coarse-loamy (2) Loamy (3) Coarse-loamy over sandy or sandy-skeletal
Drainage class	Somewhat poorly drained to well drained
Permeability class	Very slow to moderately slow
Depth to restrictive layer	40 – 180 cm
Surface fragment cover <=3"	Not specified
Surface fragment cover >3"	0 – 10 %
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 – 30 %
Subsurface fragment volume >3" (Depth not specified)	0 – 10 %

Ecological dynamics

Based on existing information and known soil/vegetation relationships of the area, the reference plant community is considered to be a Hemlock-Northern Hardwood (Edinger et al. 2014).

(NatureServe Element Code: CES202.593)

The canopy is characterized and often usually dominated by northern hardwoods (e.g., Fagus grandifolia and Acer saccharum), often with Tsuga canadensis, but may also contain large amounts of Pinus strobus and Quercus spp. Tsuga canadensis can dominate the canopy on cool/moist sites at higher elevations and in shaded coves, valley bottoms and riparian areas. Bottomlands and toeslopes may also contain Fraxinus americana, as well as Platanus occidentalis (Whitney 1990). Other common associates may include Acer rubrum, Prunus serotina, Betula lenta, Tilia americana, Pinus strobus, Liriodendron tulipifera, Quercus spp., and Magnolia acuminata. The subcanopy and shrub layers are usually well-developed and may include Viburnum lantanoides (= Viburnum alnifolium), Viburnum acerifolium, Hamamelis virginiana, and Cornus alternifolia. A dense, low to high shrub layer of Rhododendron maximum and sometimes Kalmia latifolia is sometimes present. Common herbaceous species include Maianthemum canadense, Onoclea sensibilis, Huperzia lucidula (= Lycopodium lucidulum), Dryopteris carthusiana (= Dryopteris spinulosa), Oxalis montana, and Mitchella repens (Lutz 1930, Braun 1950).

This system is currently being impacted in large parts of its range by losses or declines of several dominant tree species. Tsuga canadensis is heavily impacted by hemlock woolly adelgid (Adelges tsugae), a sucking insect that is continuing to cause close to 100% mortality in hemlocks; Orwig and Foster (1998) documented high mortality or high foliar loss by Tsuga canadensis; changes in forest composition resulted in rapid understory responses to canopy openings such as prolific establishment of Betula lenta, as well as invasion by Ailanthus altissima, Microstegium vimineum, and others). Other important trees in this system impacted by insect damage include Fraxinus americana by the emerald ash borer (Agrilus planipennis) and Fagus grandifolia by the insect Cryptococcus fagisuga, which causes fungal infections known as beech bark disease. A number of tree species of this system are also damaged by Asian long-horned beetle (Anoplophora glabripennis). Past logging in many areas has altered this system by creating a predominantly even-aged structure that contains a much higher proportion of shade-intolerant species. In many areas, this change in species composition is further aggravated by decades of overbrowsing by deer (Runkle 1982, Abrams and Orwig 1996), which has significantly reduced the hemlock component and reduced species and structural diversity in many areas. Loss of foundation tree species changes the local environment and associated ecosystem processes; those forests dominated by a few foundation species are dependent on a small number of strong interactions that may be susceptible to fluctuation among unstable states (Ellison et al. 2005). Additional threats include logging, development, overbrowsing, and road construction, which fragments large patches (Fike 1999, NYNHP 2013b). Climate change also threatens to allow expansion of woolly adelgid beyond its current restrictions in cooler climates (Paradis et al. 2007). Another threat is acid deposition due to high precipitation in the mountains downwind from coal power plants. Combined with repeated logging cycles which remove carbon and calcium sinks, this may cause soil cations to be leached and depleted and toxic elements to accumulate (Connolly et al. 2007).

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 (%)

Table 6. Community 1.2 plant community composition

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

Table 7. Community 2.1 plant community composition

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

Table 8. Community 2.2 plant community composition

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

Table 9. Community 3.1 plant community composition

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

Table 10. Community 3.2 plant community composition

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

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.

Thompson E. H., Sorenson E. R. 2000. Wetland, Woodland, Wildland: A Guide to the Natural Communities of Vermont. Vermont Department of Fish and Wildlife and The Nature Conservancy. University Press of New England, Hanover and London.

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	05/22/2020
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):**

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5. **Number of gullies and erosion associated with gullies:**

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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:**
