USDA Natural Resources Conservation Service

Ecological site F142XA021NY
Wet Till Depression

Last updated: 5/22/2020
Accessed: 04/23/2024

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 nearly level depression on till plains. Slopes range from 0 to 5 percent.

Soils:
The site consists of shallow and very deep, poorly and very poorly drained, loamy and coarse-loamy soils formed in glacial till derived from mostly limestone and sandstone. Soils range from non-acid to high base (calcareous). Representative soils are Runeberg, Lyonmounten, and Hannawa.

Vegetation:
Based on existing information and known soil/vegetation relationships of the area, the reference plant community is considered to be a Northern White Cedar Swamp or Red Maple-Northern White Cedar Swamp (Thompson and Sorenson, 2000 and Edinger et al. 2014).

Associated sites

F142XA020NY	**Rich Moist Till Frigid** Rich Moist Till is higher on the landscape. Moderately well drained to somewhat poorly drained soils.

Table 1. Dominant plant species

Tree	(1) *Thuja occidentalis* (2) *Abies balsamea*
Shrub	(1) *Rhamnus alnifolia* (2) *Rubus pubescens*
Herbaceous	(1) *Carex trisperma* (2) *Linnaea borealis*

Physiographic features

The site occurs on nearly level depression on till plains. Slopes range from 0 to 5 percent.

Table 2. Representative physiographic features

Landforms	(1) Till plain > Depression
Runoff class	Negligible
Ponding frequency	None to frequent
Slope	0–5%
Water table depth	0–20 cm

Aspect	Aspect is not a significant factor

Climatic features

Mean annual precipitation is 35 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. The average temperature in winter is 18°F and in summer it is 66°F. Average frost-free and freeze-free days are 133 and 158, respectively.

Table 3. Representative climatic features

Frost-free period (average)	133 days
Freeze-free period (average)	158 days
Precipitation total (average)	889 mm

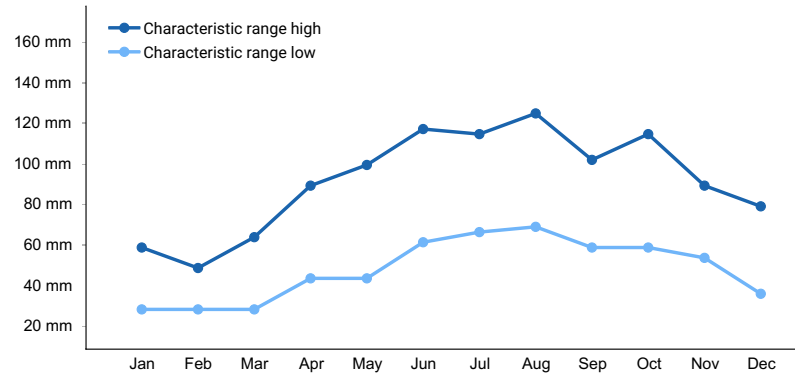


Figure 1. Monthly precipitation range

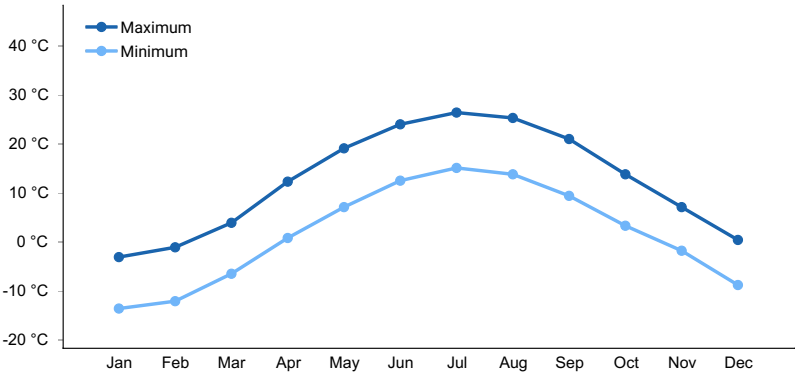


Figure 2. Monthly average minimum and maximum temperature

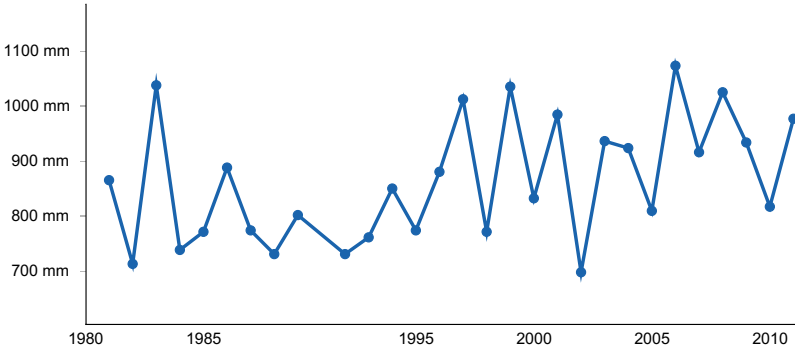


Figure 3. Annual precipitation pattern

Climate stations used

- (1) MALONE [USC00304996], Malone, NY
- (2) PLATTSBURGH AFB [USC00306659], Plattsburgh, NY
- (3) PERU 2 WSW [USC00306538], Peru, 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

Cowardin Wetland Classification:

Palustrine, Forested, Needle-Leaved Evergreen, Seasonally Saturated, Fresh, Circumneutral and Alkaline

Soil features

The site consists of shallow and very deep, poorly and very poorly drained, loamy and coarse-loamy soils formed in glacial till derived from mostly limestone and sandstone. Soils range from non-acid to high base (calcareous). Representative soils are Runeberg, Lyonmounten, and Hannawa.

Table 4. Representative soil features

Parent material	(1) Till–limestone and sandstone
Surface texture	(1) Sandy loam (2) Loam
Drainage class	Very poorly drained to poorly drained
Surface fragment cover >3"	0–2%
Soil reaction (1:1 water) (Depth not specified)	5.1–8.4
Subsurface fragment volume <=3" (Depth not specified)	2–8%
Subsurface fragment volume >3" (Depth not specified)	1–4%

Ecological dynamics

Based on existing information and known soil/vegetation relationships of the area, the reference plant community is considered to be a Northern White Cedar Swamp or Red Maple-Northern White Cedar Swamp (Thompson and Sorenson, 2000 and Edinger et al. 2014).

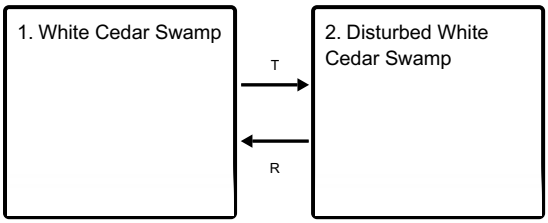
From Thompson and Sorenson, 2000:
Dominant trees are northern white cedar and balsam fir. Occasional to abundant trees include red maple, black ash, yellow birch, red spruce, black spruce, tamarack, eastern hemlock, and white pine. Shrubs include alder-leaved buckthorn, dwarf raspberry, mountain maple, red-osier dogwood, and Canada yew. Herbs include three-seeded

sedge, bunchberry, starflower, twinflower, wood sorrel, and cinnamon fern among many others.

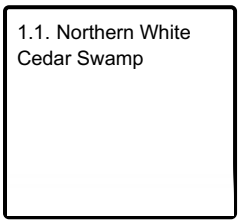
Structure and function of site is impacted by hydrology changes (impoundments, drainages, ditches, diversions, etc.) and/or introduction of invasive species such as purple loosestrife (*Lythrum salicaria*) and reedgrass (*Phragmites australis*). Extensive logging of white cedar is another disturbance. Hydrology changes will reduce the amount of white cedar present.

State and transition model

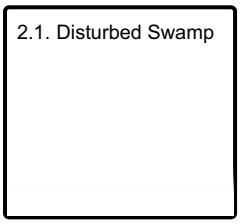
Ecosystem states



State 1 submodel, plant communities



State 2 submodel, plant communities



State 1
White Cedar Swamp

Community 1.1
Northern White Cedar Swamp

Based on existing information and known soil/vegetation relationships of the area, the reference plant community is considered to be a Northern White Cedar Swamp or Red Maple-Northern White Cedar Swamp (Thompson and Sorenson, 2000 and Edinger et al. 2014). From Thompson and Sorenson, 2000: Dominant trees are northern white cedar and balsam fir. Occasional to abundant trees include red maple, black ash, yellow birch, red spruce, black spruce, tamarack, eastern hemlock, and white pine. Shrubs include alder-leaved buckthorn, dwarf raspberry, mountain maple, red-osier dogwood, and Canada yew. Herbs include three-seeded sedge, bunchberry, starflower, twinflower, wood sorrel, and cinnamon fern among many others.

State 2
Disturbed White Cedar Swamp

Structure and function of site is impacted by hydrology changes (impoundments, drainages, ditches, diversions, etc.) and/or introduction of invasive species such as purple loosestrife (*Lythrum salicaria*) and reedgrass (*Phragmites australis*). Extensive logging of white cedar is another disturbance. Hydrology changes will reduce the amount of white cedar present.

Community 2.1
Disturbed Swamp

Structure and function of site is impacted by hydrology changes (impoundments, drainages, ditches, diversions, etc.) and/or introduction of invasive species such as purple loosestrife (*Lythrum salicaria*) and reedgrass (*Phragmites australis*). Extensive logging of white cedar is another disturbance. Hydrology changes will reduce the amount of white cedar present.

Transition T
State 1 to 2

Hydrology changes (impoundments, diversions, ditches, roads, drainage, etc.)

Restoration pathway R
State 2 to 1

Restoration of function and structure of site.

Conservation practices

Wetland Restoration

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

Cowardin L. M., Carter V., Golet F. C., and LaRoe E.T. 1979. Classification of Wetlands and Deepwater Habitats of the United States. U.S. Fish and Wildlife Service. U.S. Government Printing Office, Washington, D.C., 20402.

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

Nels Barrett, 5/22/2020

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	04/23/2024
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:

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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:**
