Ecological site F144BY305ME
Wet Loamy Flat

Last updated: 6/29/2020
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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): 144B–New England and Eastern New York Upland, Northern Part

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This major land resource area (MLRA) is characterized by plateaus, plains, and mountains. The climate is generally cool and humid with an average annual precipitation of 34 to 62 inches (865 to 1,575 millimeters). The average annual air temperature is typically 40 to 48 degrees F (4 to 9 degrees C). The freeze-free period generally is 130 to 200 days, but it ranges from 110 days in the higher mountains to 240 days in some areas along the Atlantic coast. The soils in this region are dominantly Entisols, Spodosols, and Inceptisols. They commonly have a fragipan. The dominant suborders are Ochrepts, Orthods, Aquepts, Fluvents, and Saprists. The soils in the region dominantly have a frigid soil temperature regime with some cryic areas at higher elevation, a udic soil moisture regime, and mixed mineralogy. Most of the land is forested, and 98 percent is privately owned. Significant amounts of forest products are produced including lumber, pulpwood, Christmas trees, and maple syrup. Principal agricultural crops include forage and grains for dairy cattle, potatoes, apples, and blueberries. Wildlife habitat and recreation are important land uses. Stoniness, steep slopes, and poor drainage limit the use of many of the soils.

Classification relationships

NRCS:
Land Resource Region: R—Northeastern Forage and Forest Region
MLRA: 144B—New England and Eastern New York Upland, Northern PartMLRA resources
Major Land Resource Area (MLRA): 144B–New England and Eastern New York Upland, Northern Part

Ecological site concept

This site occurs in gently sloping areas near the bottom of watersheds where water saturates glacial till deposits for much of the growing season. Soils are poorly-drained with loamy surface textures and till parent materials. The water table is seasonally high (within 18 inches of the surface) and typically dries out in late summer and fall. This site is typically drier than Loamy Till Swamp and Acidic Swamp sites, is not usually ponded, and does not include a major component of very poorly-drained soils. Red spruce and/or black spruce dominate, sometime intermixed with larch, and balsam fir is common in younger patches. Sphagnum mosses, cinnamon fern and other herbs are often abundant in the understory.

Associated sites

F144BY301ME	**Loamy Till Swamp** The Wet Loamy Flat site occurs on poorly-drained flats, which are somewhat drier and may occur upslope from the Loamy Till Swamp. Wet Flats support more spruce and less cedar.

F144BY503ME	**Loamy Flat** The Loamy Flat site occurs on somewhat-poorly and poorly-drained soil complexes that are somewhat drier and have significantly less understory production than the Wet Loamy Flat site.

Similar sites

F144BY503ME	**Loamy Flat** The Loamy Flat site occurs on somewhat-poorly and poorly-drained soil complexes that are somewhat drier and have significantly less understory production than the Wet Loamy Flat site.
F144BY302ME	**Mucky Swamp** Both the Mucky Peat Swamp and the Loamy Till Swamp are dominated by northern white cedar, but the Mucky Peat Swamp is wetter, has a thicker organic soil surface layer, and typically has a more open canopy, allowing more light to reach the forest floor. As a result, the understory is often more productive in the Mucky Peat Swamp.
F144BY301ME	**Loamy Till Swamp** While both sites are derived from loamy lodgment till parent materials, the Wet Loamy Flat is drier than the Loamy Till Swamp, with poorly-drained mineral soils rather than very poorly- and very-poorly drained organic soils and mineral soils. Wet Loamy Flat is dominated by spruce rather than northern white cedar.
F144BY303ME	**Acidic Swamp** The Loamy Wet Flat site is drier than the Acidic Swamp site, with poorly-drained mineral soils rather than very poorly- and very-poorly drained organic soils and mineral soils. Loamy wet flat typically supports more red spruce than black spruce.

Table 1. Dominant plant species

Tree	Not specified
Shrub	Not specified
Herbaceous	Not specified

Physiographic features

This site occurs on gently sloping till plains, ground moraines and hills. Though soils are poorly-drained with a seasonally-high water table, this site does not experience much ponding of water on the soil surface. During dry periods from June to September, the water table may drop to more than 18 inches below the soil surface.

Table 2. Representative physiographic features

Landforms	(1) Till plain (2) Hill
Flooding frequency	None
Ponding frequency	None
Elevation	0–2,500 ft
Slope	0–8%
Water table depth	0–18 in
Aspect	Aspect is not a significant factor

Climatic features

The climate is humid and temperate. It is characterized by warm summers and cold winters. The average first frost around October 1st and the last freeze of the season occurs around April 23rd. Temperature extremes in the summer can reach as high as 100 degrees F and as low as -33 degrees F in the winter. The average relative humidity is 71 percent. The sun shines on average 57 percent of the time. Bad storm events can come in from the northeast, thus the term “nor’easter”. Winter blizzards can result in several feet of snow, while summer hurricane events can produce 2-3 inches of rain per hour. Annual rainfall occurs quite evenly over the entire year with August being the driest month during the growing season from April through September. Rainfall during this period

generally falls during thunderstorms, and fairly large amounts of rain may fall in a short time. Eighty-eight percent of the snowfall occurs from December through March and average total snowfall is 64 inches per year. This makes for a “mud season” from March through April where runoff is high and ponding may occur because surface water runoff is very slow. The original data used in developing the table below was obtained from the USDA-NRCS National Water & Climate Center climate information database. All the climate station monthly averages for maximum and minimum temperature and precipitation were then added together and averaged to make this table. The precipitation and temperature data come from the years 1981 through 2010.

Table 3. Representative climatic features

Frost-free period (characteristic range)	117-140 days
Freeze-free period (characteristic range)	144-170 days
Precipitation total (characteristic range)	42-48 in
Frost-free period (actual range)	98-146 days
Freeze-free period (actual range)	133-180 days
Precipitation total (actual range)	40-54 in
Frost-free period (average)	126 days
Freeze-free period (average)	159 days
Precipitation total (average)	46 in

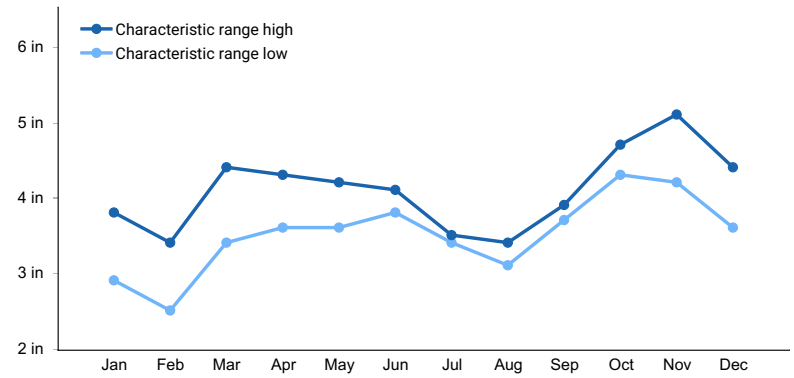


Figure 1. Monthly precipitation range

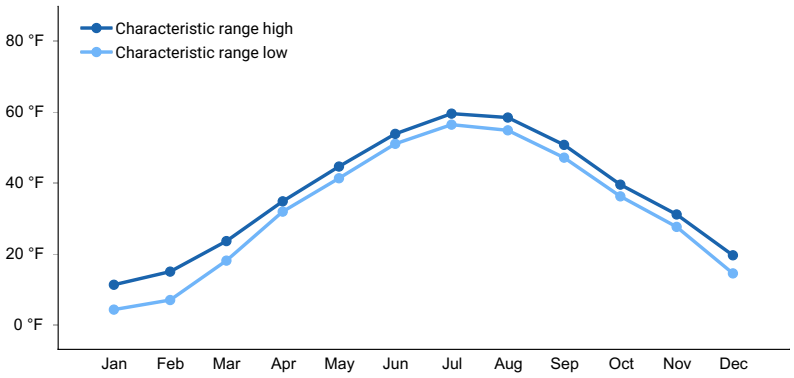


Figure 2. Monthly minimum temperature range

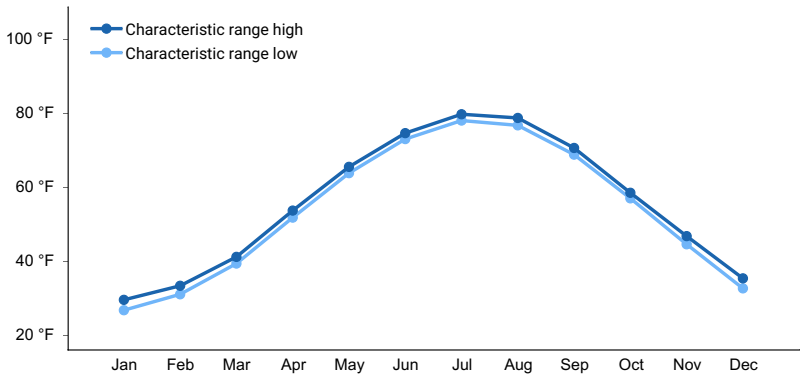


Figure 3. Monthly maximum temperature range

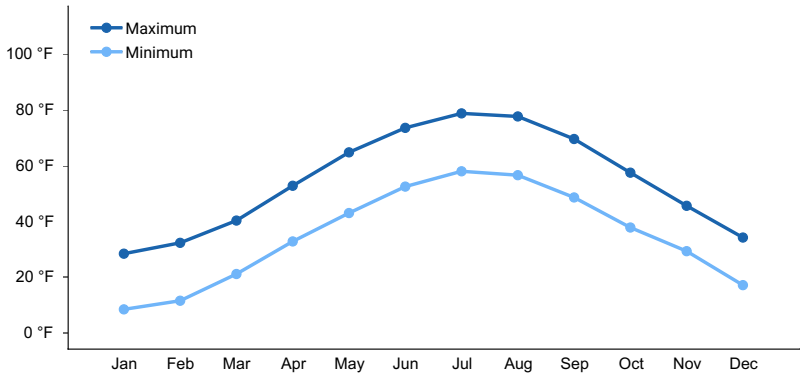


Figure 4. Monthly average minimum and maximum temperature

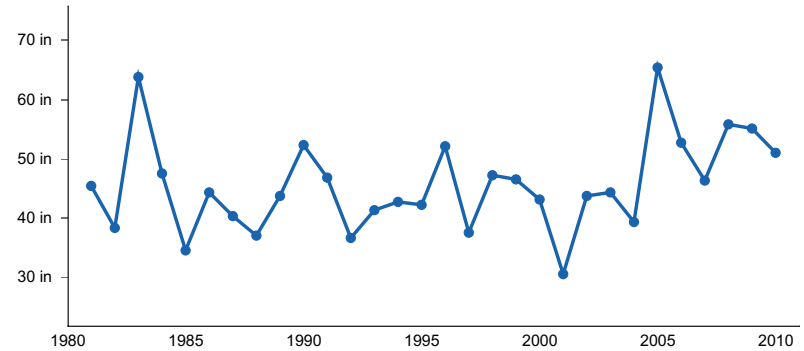


Figure 5. Annual precipitation pattern

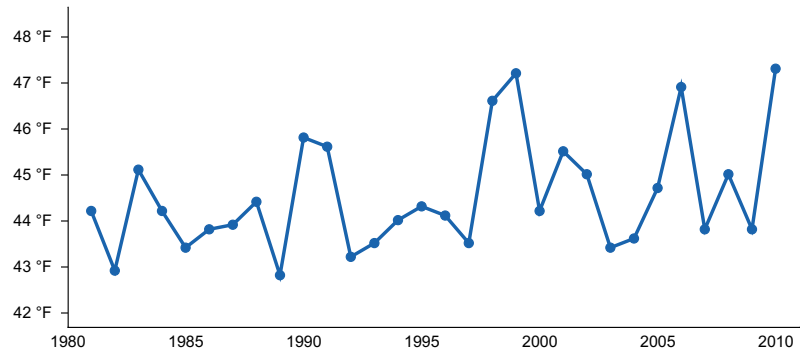


Figure 6. Annual average temperature pattern

Climate stations used

- (1) BELFAST [USC00170480], Belfast, ME
- (2) ACADIA NP [USC00170100], Bar Harbor, ME
- (3) CORINNA [USC00171628], Corinna, ME

- (4) DOVER-FOXCROFT WWTP [USC00171975], Dover Foxcroft, ME
- (5) FARMINGTON [USC00172765], Farmington, ME
- (6) GARDINER [USC00173046], Gardiner, ME
- (7) JONESBORO [USC00174183], Addison, ME
- (8) LEWISTON [USC00174566], Auburn, ME
- (9) MADISON [USC00174927], Anson, ME
- (10) NEWCASTLE [USC00175675], Newcastle, ME
- (11) ORONO [USC00176430], Old Town, ME
- (12) WATERVILLE TRTMT PLT [USC00179151], Waterville, ME
- (13) WEST ROCKPORT 1 NNW [USC00179593], Rockport, ME
- (14) AUGUSTA STATE AP [USW00014605], Augusta, ME
- (15) BANGOR INTL AP [USW00014606], Bangor, ME
- (16) PORTLAND INTL JETPORT [USW00014764], Portland, ME

Influencing water features

Large amounts of water move laterally through the poorly-drained soils of this site, however, it typically has enough slope and elevation to minimize ponding on the soil surface.

Wetland description

Wetland Description: Cowardin
System: Palustrine
Subsystem: N/A
Class: Unknown

Soil features

Soils of this site are poorly-drained. They formed in loamy till and often have a thin organic layer at the soil surface. A dense till layer is typically present within ~43 inches of the soil surface, which perches water and impedes root growth. These soils are often strongly acidic.

Table 4. Representative soil features

Parent material	(1) Till–granite and gneiss
Surface texture	(1) Silt loam (2) Fine sandy loam (3) Mucky peat
Drainage class	Poorly drained
Soil depth	0–60 in
Surface fragment cover <=3"	0%
Surface fragment cover >3"	0–9%
Available water capacity (Depth not specified)	2–9.8 in
Calcium carbonate equivalent (Depth not specified)	0%
Electrical conductivity (Depth not specified)	0 mmhos/cm
Sodium adsorption ratio (Depth not specified)	0
Soil reaction (1:1 water) (Depth not specified)	3.5–7.3
Subsurface fragment volume <=3" (Depth not specified)	0–25%

Subsurface fragment volume >3" (Depth not specified)	0–11%

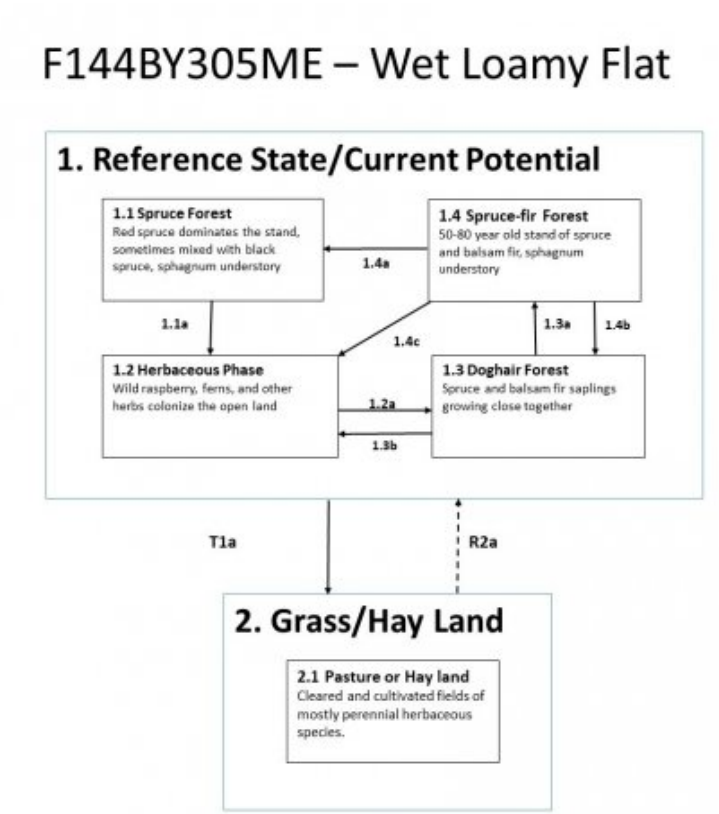
Ecological dynamics

This site is dominated by red spruce, sometimes mixed with black spruce, and a sphagnum moss-cinnamon fern understory. It is often logged, which sets the stand through a series of phases, beginning with herbaceous colonizers, then dense spruce and balsam fir saplings, and eventually to mature spruce-fir forest. Within 100 years, any balsam fir dies out from the overstory, and red spruce once again dominates the site. Similar community dynamics occur within stands on this site as blowdowns or spruce budworm open up small patches of mature overstory trees for establishment by herbs and conifer saplings. Large-scale budworm outbreaks are expected to have result in similar dynamics as large-scale timber harvest.

In some areas this site has been converted to perennial grass hayland.

Relationship to Other Classification Systems
This site includes the following state natural heritage program types:
• Lowland Spruce-fir forests (Sperduto and Nichols 2004)
• Red spruce swamp (Sperduto and Nichols 2004)
• Spruce-fir wet flat (Gawler and Cutko 2010)
• Spruce-fir-tamarack Swamps (Thompson and Sorenson 2000)

State and transition model



State 1
Reference State/Current Potential

Community 1.1
Spruce Forest

Red spruce dominates the stand, sometimes mixed with black spruce, sphagnum understory

Community 1.2
Herbaceous Phase

Wild raspberry, ferns, and other herbs colonize the open land

Community 1.3
Doghair Forest

Spruce and balsam fir saplings growing close together

Community 1.4
Spruce-fir Forest

50-80 year old stand of spruce and balsam fir, sphagnum understory

Pathway 1.1a
Community 1.1 to 1.2

Logging or blowdown opens space and light in large or small patch

Conservation practices

Early Successional Habitat Development/Management
Forest Stand Improvement

Pathway 1.2a
Community 1.2 to 1.3

Time, vegetation development

Pathway 1.3b
Community 1.3 to 1.2

Logging or blowdown opens space and light in large or small patch

Pathway 1.3a
Community 1.3 to 1.4

Time, vegetation development

Pathway 1.4a
Community 1.4 to 1.1

Time, self-thinning (balsam fir and other pioneer tree species die out), vegetation development

Pathway 1.4b
Community 1.4 to 1.2

selective harvest

Conservation practices

Forest Land Management

Pathway 1.4b
Community 1.4 to 1.3

Logging or blowdown opens space and light in large or small patch

Conservation practices

Forest Land Management

State 2
Grass/Hay Land

Community 2.1
Pasture or Hayland

Cleared and cultivated fields of mostly perennial herbaceous species.

Transition T1a
State 1 to 2

Tree and stump removal, pasture cultivation

Conservation practices

Clearing and Snagging
Land Clearing

Restoration pathway R2a
State 2 to 1

Time abandonment, vegetation development

Conservation practices

Upland Wildlife Habitat Management

Additional community tables

Inventory data references

Site Development and Testing Plan
Future work is needed, as described in a project plan, to validate the information presented in this provisional ecological site description. Future work includes field sampling, data collection and analysis by qualified vegetation ecologists and soil scientists. As warranted, annual reviews of the project plan can be conducted by the Ecological Site Technical Team. A final field review, peer review, quality control, and quality assurance reviews of the ESD are necessary to approve a final document.

Other references

Gawler, S. and A. Cutko. 2010. Natural Landscapes of Maine. A Guide to Natural Communities and Ecosystems. Maine Natural Areas Program, Maine Department of Conservation, Augusta, ME.

Johanson, J. K., Butler, N. R. and C. Bickford. 2016. Classifying Northern New England Landscapes for Improved Conservation. Rangelands 38:6.

Sperduto, D.D. and W.F. Nichols. 2004. Natural Communities of New Hampshire. New Hampshire Natural Heritage Bureau and The Nature Conservancy.

Thompson, E. H., and E. R. Sorenson. 2000. Wetland, woodland, wildland: A guide to the natural communities of Vermont. The Nature Conservancy and the Vermont Department of Fish and Wildlife. University Press of New England, Hanover, NH. 456 pp.

USDA NRCS 2006. Land resource regions and major land resource areas of the United States, the Caribbean, and the Pacific Basin. USDA Handbook 296.

Contributors

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Approval

Nels Barrett, 6/29/2020

Acknowledgments

Nels Barrett Ph.D.

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	05/03/2024
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:

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17. **Perennial plant reproductive capability:**
