

Ecological site F146XY032ME

Loamy Till Bottom

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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.

Ecological site concept

This site typically occurs on relatively-flat areas (1-2 percent slopes) where water saturates glacial till deposits for much of the growing season. Often it is found in valley bottoms, near open wetlands and drainageways, or in surface water discharge areas such as slope breaks. Northern white cedar is the dominant overstory plant on this site, often with small diameter hardwoods and softwoods such as brown ash, balsam fir, and yellow birch present but not dominant.

Soils formed in mineral glacial till deposits, and consist of poorly-drained hummocks and very-poorly-drained depressions. Trees grow mostly on the hummocks, and diverse understory species occupy various niches associated with the complex microtopography. Dark organic materials are present on the soil surface, but the subsoil consists of lighter grey and brown mineral soils that are regularly saturated with water. These soils receive significant extra water from the above watershed, often with ponding in the depressions during wet periods.

The plant community is characterized by 50-75 percent overstory canopy cover, with diverse, productive, herbaceous understory and generally few shrubs. This site may be subject to ponding as a result of beaver activity or man-made structures. In such cases, the site may persist in a ponded state, or if obstructions are removed, may progress through several open wetland and pioneer forest phases prior to cedar re-establishment. Logging and wind may result in patches of increased herbaceous production, and are expected to revert to conifer dominance over time.

Logging and wind may open up patches of tree canopy which result in increased herb production. In areas where this site is cleared, drained, and cultivated, it is used for mostly hay and pasture, or rarely as cropland.

Associated sites

F146XY021ME	<p>Marsh The Marsh site may occur near this site as it grades into wetter soils with deeper organic deposits. Marsh sites are typically open herbaceous wetlands or red maple wetlands, rather than cedar woodlands found on loamy till bottoms.</p>
F146XY051ME	<p>Rockland The mucky beat bottom site often intergrades with the loamy till bottom site as soils get wetter and organic deposits get deeper.</p>

Similar sites

F146XY051ME	<p>Rockland This site has organic soil throughout the profile, rather than mineral soil under an organic surface layer. Both sites have abundant northern white cedar, but overstory canopy cover is usually less than 50 percent on the mucky peat bottom site, allowing for more herbaceous production in the understory than the loamy till bottom site.</p>
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Table 1. Dominant plant species

Tree	(1) <i>Thuja occidentalis</i>
Shrub	Not specified
Herbaceous	Not specified

Physiographic features

This site occurs in valley bottoms, near open wetlands and drainageways, or in surface water discharge areas such as slope breaks. It is characterized by pit and mound* topography, with frequent ponding of water in the pits and drier conditions on the mounds.

In the pits, the water table is typically near the soil surface (or above when ponded), while on the mounds, the water table may be a foot or more below the soil surface. Slopes are typically less than 5 percent for this site, but can be as high as 8 percent. This site occurs throughout MLRA 146 at elevations between 120 and 2,500 feet.

*Pit and mound topography is formed by the natural process of falling trees, which removes soil from the pit as they are uprooted, and deposit the soil in a mound next to the pit as the tree decays. When pit and mound topography is eliminated by land-leveling practices, it can take decades or centuries to develop naturally on this site. Much of the species diversity of this site results from the high variability in soil and plant growing conditions associated with pit and mound topography.

Table 2. Representative physiographic features

Landforms	(1) Ground moraine (2) Till plain
Flooding frequency	None
Ponding duration	Brief (2 to 7 days) to long (7 to 30 days)
Ponding frequency	Frequent
Elevation	37–762 m
Slope	0–5%
Ponding depth	0–10 cm
Water table depth	0–30 cm
Aspect	Aspect is not a significant factor

Climatic features

The climate of this site is characterized by cold, snowy winters, and cool summers. Annual precipitation ranges from 34 to 51 inches. Precipitation is nearly equally distributed throughout the year, with slightly more moisture falling in June-October. During winter months, and sometimes fall and spring, cold winds from the north bring severe weather events. The effects of a relatively short growing season are somewhat mitigated by long summer days associated with the high latitudes of the region. Occasionally high winds, microburst, or freezing rain events damage vegetation over small portions of the landscape.

Table 3. Representative climatic features

Frost-free period (average)	100 days
Freeze-free period (average)	129 days
Precipitation total (average)	1,016 mm

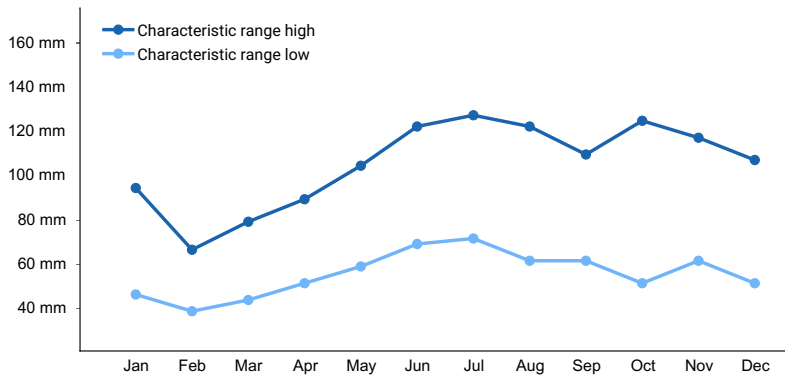


Figure 1. Monthly precipitation range

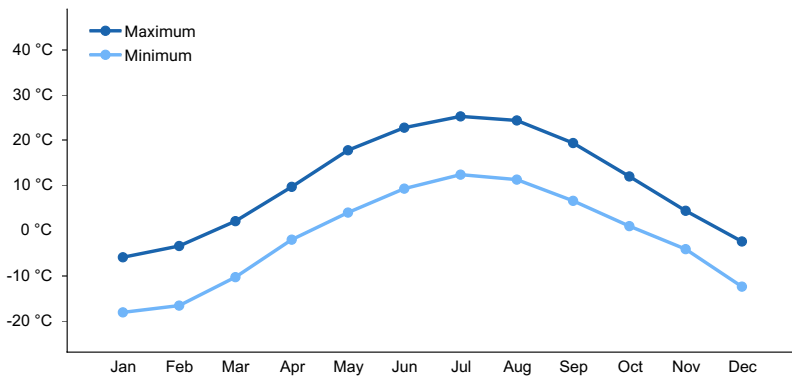


Figure 2. Monthly average minimum and maximum temperature

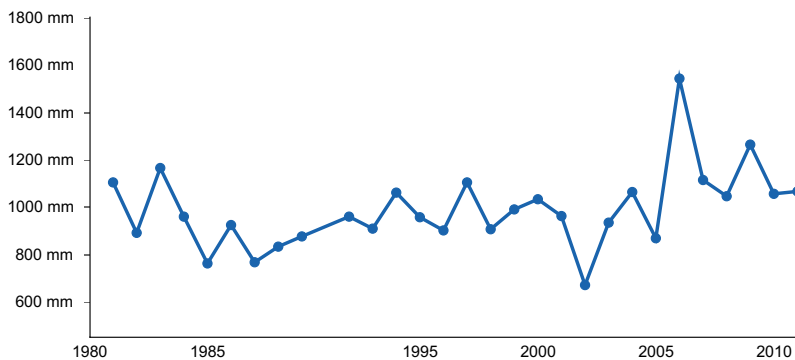


Figure 3. Annual precipitation pattern

Climate stations used

- (1) FT KENT [USC00172878], Fort Kent, ME
- (2) CARIBOU MUNI AP [USW00014607], Caribou, ME
- (3) ALLAGASH [USC00170200], Saint Francis, ME
- (4) BRIDGEWATER [USC00170833], Bridgewater, ME
- (5) HOULTON 5N [USC00173944], Houlton, ME
- (6) PRESQUE ISLE [USC00176937], Presque Isle, ME
- (7) HOULTON INTL AP [USW00014609], Houlton, ME

Influencing water features

This site receives extra moisture from neighboring watersheds which causes soil saturation for much of the growing season. The water table fluctuates throughout the year, often with ponding in depressions following spring runoff or large storm events. During dry periods, the water table may drop up to 1 foot beneath the soil surface.

Soil features

The soils of this site are characterized by two soil types that occur together due to pit and mound topography. The pits are natural depressions consisting of very poorly-drained, frequently ponded soil with about one foot of muck on top of light grey (gleyed) mineral soil. The mounds are typically poorly-drained, not ponded, and may or may not have a thin layer of organic matter (less than 3 inches) above the mineral soil, which may range from light grey to brown in color.

Soil depth is variable on this site depending on the presence or absence of a dense layer of compacted subsoil that restricts water movement and plant roots. This dense layer is the result of compaction by the weight of glaciers and may or may not be present in all areas where this site occurs.

These soils formed in glacial till deposits of either acidic or calcareous parent material. Parent materials which are calcareous tend to produce more and larger hardwoods compared to those with acidic parent materials. The soil temperature regime is frigid, and the soil moisture regime is aquic.

Table 4. Representative soil features

Parent material	(1) Lodgment till–quartzite (2) Supraglacial meltout till–shale and siltstone
Surface texture	(1) Silt loam (2) Gravelly silt loam (3) Mucky
Family particle size	(1) Loamy
Drainage class	Poorly drained to very poorly drained
Permeability class	Slow
Soil depth	51 cm
Surface fragment cover <=3"	0–15%
Surface fragment cover >3"	0–3%
Available water capacity (0-101.6cm)	10.16–29.72 cm
Calcium carbonate equivalent (0-101.6cm)	0%
Electrical conductivity (0-101.6cm)	0 mmhos/cm
Sodium adsorption ratio (0-101.6cm)	0
Soil reaction (1:1 water) (0-101.6cm)	3.5–7.3
Subsurface fragment volume <=3" (Depth not specified)	0–15%
Subsurface fragment volume >3" (Depth not specified)	0–6%

Ecological dynamics

The plant community is dominated by Northern White Cedar, with scattered balsam fir, red maple, yellow birch, black ash, and red and black spruce. Understory consists of mostly herbaceous wetland species and sphagnum mosses, generally with few shrubs. In some areas, this site may be disturbed by ponding associated with beaver activity or road and other structures that impede runoff from the site. When ponded, cedar and other trees typically die, and only return following the removal of beaver dams or structures impeding runoff. Once ponding is removed, this site may transition through various open wetland phases and/or early seral forest communities prior to cedar re-establishment and dominance.

Logging and wind may open up patches of tree canopy which result in increased herb production. In areas where this site is cleared, drained, and cultivated, it is used for mostly hay and pasture, or rarely as cropland.

State and transition model

Ecosystem states

1. Reference State

State 1 submodel, plant communities

1.1. Cedar-dominated

State 1 Reference State

Community 1.1 Cedar-dominated

Additional community tables

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, Maine.

Contributors

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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	
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):**

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:**
