

Ecological site F146XY033ME

Wet Loamy Flat

Last updated: 5/20/2025
Accessed: 08/22/2026

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): 146X–Aroostook Area

This area is entirely in Maine and it makes up about 1,275 square miles (3,305 square kilometers). Presque Isle is the largest city in the area. Interstate 95 ends in the town of Houlton, at the border with New Brunswick, Canada. Aroostook State Park, Fort Kent Historic Site, and Loring Commerce Center are in this area. The Big Rock ski area is in the middle of this MLRA and is on the highest point, which is Mars Hill Mountain.

Ecological site concept

The site occurs on deep, loamy soils that are poorly- to very poorly-drained. They formed in relatively flat glacial outwash or lakebed sediments with slopes generally less than 8 percent. This site has a seasonally-high water table which affects plant species composition and community dynamics. Balsam fir and red spruce dominate the overstory, with a productive understory of diverse wetland herbs, shrubs, and mosses. Logging, wind and insects, particularly the spruce budworm, drive plant community dynamics on this site. As overstory tree canopy is reduced, herbs and shrubs increase, followed by the re-establishment of thick stands of spruce and fir saplings. About twenty to sixty years following disturbance, a young mature spruce-fir forest emerges and understory species begin to re-establish in the community. After about sixty years without tree removal disturbance, many mature fir trees die out, resulting in a spruce-dominated forest. These mature stands include patches of younger stands resulting from small areas of blowdown or other disturbances. Hurricane force winds and fire are rare on this site, but may result in entire stands reverting to the early herb/shrub phase. When this site is cleared, drained, and cultivated, it transitions to a new state that produces mostly pasture, hay, or sometimes cropland. The soil temperature regime is frigid and the soil moisture regime is aquic.

Associated sites

F146XY021ME	Marsh This site may grade into the Marsh site as soils become too wet for tree persistence.
F146XY034ME	Wet Sandy Bog This site may grade into the Wet Sandy Bog site as the soils become wetter and more acidic.

Similar sites

F146XY034ME	Wet Sandy Bog The Wet Sandy Bog site is similar in the understory, but has lower overall tree cover and black spruce as the dominant tree. It occurs on wetter, more acidic soils.
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Table 1. Dominant plant species

Tree	(1) <i>Abies balsamea</i> (2) <i>Picea rubens</i>
Shrub	(1) <i>Alnus incana ssp. rugosa</i> (2) <i>Chamaedaphne calyculata</i>
Herbaceous	(1) <i>Osmunda cinnamomea</i> (2) <i>Rubus arcticus ssp. acaulis</i>

Physiographic features

This site occurs on relatively flat glacial outwash or lakebed sediments. Elevations range from nearly sea level up to 1750 feet. This site has a seasonally-high water table within 18 inches of the soil surface from about October to May in normal precipitation years.

Table 2. Representative physiographic features

Landforms	(1) Outwash plain (2) Lake plain (3) Outwash terrace
Runoff class	Negligible to low
Flooding frequency	None
Ponding frequency	None
Elevation	0 – 530 m
Slope	0 – 10 %
Water table depth	0 – 50 cm
Aspect	Aspect is not a significant factor

Climatic features

The climate of this site is characterized by cold, snowy winters, and cool summers. 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 (characteristic range)	80-90 days
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Freeze-free period (characteristic range)	130-130 days
Precipitation total (characteristic range)	940-1,070 mm
Frost-free period (actual range)	60-110 days
Freeze-free period (actual range)	100-140 days
Precipitation total (actual range)	910-1,070 mm
Frost-free period (average)	90 days
Freeze-free period (average)	130 days
Precipitation total (average)	990 mm

- (1) CARIBOU MUNI AP [USW00014607], Caribou, ME
- (2) ALLAGASH [USC00170200], Saint Francis, ME
- (3) BRIDGEWATER [USC00170833], Bridgewater, ME
- (4) FT KENT [USC00172878], Fort Kent, 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 significant run-in moisture from surrounding uplands, and consists of poorly- and very poorly-drained hydric soils. These wetland soils, combined with wetland hydrology, support wetland species in the overstory and understory. Though flooding and ponding do not typically occur on this site, an elevated water table from October to May influences vegetation composition and community dynamics.

Soil features

The soils of this site are deep, loamy and poorly- to very poorly-drained. They formed in relatively flat glacial outwash or lakebed sediments with slopes generally less than 8 percent. This site typically has few rock fragments throughout the soil profile, though some areas may have up to 40 percent gravel by volume. The soil temperature regime is frigid and the soil moisture regime is aquic.

Table 4. Representative soil features

Parent material	(1) Glaciofluvial deposits – slate (2) Glaciolacustrine deposits – siltstone
Surface texture	(1) Silt loam
Family particle size	(1) Loamy

Drainage class	Poorly drained to very poorly drained
Permeability class	Very slow
Soil depth	170 cm
Surface fragment cover <=3"	Not specified
Surface fragment cover >3"	Not specified
Available water capacity (0-101.6cm)	5.08 – 29.21 cm
Calcium carbonate equivalent (0-101.6cm)	Not specified
Electrical conductivity (0-101.6cm)	Not specified
Sodium adsorption ratio (0-101.6cm)	Not specified
Soil reaction (1:1 water) (0-101.6cm)	4.5 – 7.3
Subsurface fragment volume <=3" (Depth not specified)	0 – 40 %
Subsurface fragment volume >3" (Depth not specified)	Not specified

Ecological dynamics

Caveat: The vegetation information contained in this section and is only provisional, based on concepts, and future projects support validation through field work. *] The vegetation groupings described in this section are based on the terrestrial ecological system classification and vegetation associations developed by NatureServe (Comer 2003) and localized associations provided by the Maine Natural Areas Program (Gawler and Cutko, 2010).

The plant community is dominated by balsam fir and red spruce, with black spruce, northern white cedar, larch and red maple also common. Shrubs such as speckled alder, black huckleberry, mountain holly, lowbush blueberry and diverse heath shrubs are commonly

found in the understory, along with diverse wetland herb and moss species.

Important drivers of plant community dynamics are logging, wind, and insects, particularly spruce budworm. As tree canopy is reduced over large areas or small patches due to one of these drivers, shrub and herbaceous productivity increases for a period of a few years before being overcome by thick stands of spruce and fir saplings. Twenty to sixty years following tree removal, spruce and fir saplings reach a young mature forest and understory species begin to re-establish and increase in the understory. After about sixty years without tree-removal disturbance, many mature balsam fir trees die, resulting in a red spruce-dominated stand. These mature stands include patches of younger stands resulting from small areas of blowdown or other disturbances.

Hurricane force winds and fire are rare on this site, but may result in entire stands reverting to the early herb/shrub phase.

When this site is cleared, drained, and cultivated, it transitions to a new state that produces mostly pasture, hay, or sometimes cropland.

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 (%)
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Table 6. Community 2.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production ()	Foliar Cover (%)
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Table 7. Community 2.2 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production ()	Foliar Cover (%)
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Table 8. Community 2.3 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production ()	Foliar Cover (%)
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Table 9. Community 3.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production ()	Foliar Cover (%)
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Table 10. Community 3.2 plant community composition

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

Future work is needed, as described in a future 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

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Contributors

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Approval

Greg Schmidt, 5/20/2025

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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	05/06/2025
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:
