USDA Natural Resources Conservation Service

Ecological site F143XY501ME
Loamy Slope

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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): 143X–Northeastern Mountains

MLRA 143, known as the Northeastern Mountains, covers approximately 23 million acres of mountains, hills, and valleys in northern Maine, New Hampshire, Vermont, New York, and Massachusetts. The area is sparsely populated, with less than five percent of the land area developed for agriculture, residential, and urban development. About 90 percent of the area is forested, most of which is actively managed for timber. Elevations are mostly between 1,000 to 4,000 feet, with a few isolated peaks more than 5,000 feet above sea level. The present day mountains are but remnants of a much larger ancient range that has been eroding for approximately 500 million years. Bedrock consists of mostly very old metamorphic rock (gneiss, schist, slate, marble, quartzite, etc.) with younger intrusions of igneous rock (e.g. granite and granodiorite) from the Triassic and Cretaceous periods. MLRA 143 differs somewhat geologically from its neighboring MLRAs (142, 144A, 144B, 145, and 146), which have greater amounts of nutrient-rich sedimentary rock. Compared to MLRA 143, they are all lower in elevation, with longer growing seasons large areas that were once submerged by the ocean following glaciation.

The characteristic landforms and soils of northern New England were derived from the massive continental ice sheet that engulfed the region during North America’s most recent glaciation. Mighty glaciers, embedded with sediment and rock fragments, scoured bedrock and compacted mineral beds in a steady march south and east toward the Atlantic Ocean. The softer sedimentary rocks were pulverized into fine silts and clays under the immense weight of ice a mile thick, while the more resistant igneous and metamorphic rocks were sculpted into steep mountains and hills or plucked and dragged along the base of the glacier. With a warming climate, the ice retreated northward, depositing a thin layer of unsorted glacial till sediment atop the newly-exposed bedrock and compacted mineral beds. Deeper mounds of unsorted till formed small hills, kames, moraines and drumlins. Enormous chunks of ice detached as the glacier retreated, melting slowly in place and forming many kettle lakes and basins where water and fine sediments collect. Raging torrents of glacial meltwater dissected much of the barren landscape, entraining coarse and fine sediments, carving river valleys, and leaving well-sorted deposits of mostly sand and gravel along the watercourse. By 10,000 years ago the ice sheet had fully receded from MLRA 143. Silty floodplains developed along perennial rivers, many of which occupy the same channels that once gushed with sediment-rich glacial meltwater. Over time, wet basins accumulated fine sediment, some dried out, and still others became acidified by organic matter inputs from colonizing vegetation.

Classification relationships

This site occurs in Ecological Site Group 5 (Loamy Forests) of MLRA 143 (The Northeastern Mountains), in the Northeastern Forage and Forest Region (Land Resource Region R).

The Northeastern Forage and Forest LRR includes all of Maine, New Hampshire, Vermont, Rhode Island, and Connecticut, as well as large portions of Massachusetts, New York, New Jersey, Pennsylvania, and Ohio. Its southern boundary marks the extent of the Wisconsin ice sheet, which engulfed the entire LRR as recently as 10,000 to 15,000 years ago. Erosional and depositional processes associated with glaciation created many of the topographic patterns that distinguish MLRAs within the Northeastern region. Harder granitic and metamorphic

bedrock to the north were more resistant to glacial erosion, resulting in the relatively nutrient poor mountains of MLRA 143; whereas nutrient-rich sedimentary bedrock of MLRAs 139, 140, and 146 resulted in relatively flat, fertile landscapes ideal for cultivation. Other areas were depressed below sea-level by the sheer mass of the glacier, resulting in pockets of marine sediments which distinguish MLRAs 142, 144A, 144B, and 145.

Precipitation is sufficient to support productive forestland throughout the Northeastern region. Still, a latitudinal temperature gradient from mesic to frigid soil temperatures results in a general transition from central hardwoods and pine in the southern MLRAs to northern hardwoods and spruce-fir forests farther north (no true boreal forests exist in the region). Elevations are generally low throughout the Northeastern region, with the exception of MLRA 143 which has many high mountain ecosystems with cryic temperature regimes and alpine vegetation above the tree line.

Ecological site concept

This site occurs mostly on well- to moderately well-drained loam soils, and associated somewhat poorly-drained soils. Bedrock is greater than 20 inches below the mineral soil surface. Soils may be underlain by a densely compacted till layer. This site is commonly found on backslope and footslope positions, but may occur on flats or any number of landforms. The vegetation is characterized by northern hardwoods, particularly sugar maple, red maple, yellow birch, and beech, with diverse hardwood associates. Shallower and wetter inclusions in this site typically produce more softwoods, including red spruce, hemlock, northern white cedar, and balsam fir. This site is likely overmapped. Perhaps a Mod-deep Loamy (mixedwood) concept and/or a Loamy Upland Flats (spruce-fir) concept could reflect consistent, meaningful patterns between vegetation and soil properties.

Associated sites

F143XY502ME	**Loamy Till Toeslope** The Loamy Till Toeslope site tends to occur downslope of the Loamy Slopes site, especially when there is a large watershed above. The Loamy Till Toeslope site is wetter and tends to have more more richness indicators and softwood species than Loamy Slope sites.
F143XY702ME	**Shallow And Moderately Deep Till** The Shallow and Moderately-deep Till site tends to occur upslope of the Loamy Slopes site as soil begin to transition from deep to shallow over bedrock. As soils get shallower, softwood abundances increases in the community.

Similar sites

F143XY504ME	**Enriched Loamy Cove** The Loamy Cove site richer than the Loamy Slopes site, and typically occurs in lower landscape positions where nutrients tend to accumulate. Both sites produce hardwoods, but the Loamy Cove supports many rich indicator species, and has a thick, dark, nutrient-rich soil surface horizon compared to that of Loamy Slope.
F143XY505ME	**Loamy Over Sandy** The Loamy Over Sandy site is formed in ablation till, which lacks the dense horizon characteristic of Loamy Slopes. The two sites are very similar, however the Loamy Over Sandy soils are coarser, drier, and produces more hemlock and red spruce compared to the northern hardwood stands that characterize the Loamy Slopes site.
F143XY702ME	**Shallow And Moderately Deep Till** The Loamy Slope site may include both deep (>40 inches) and mod-deep (20-40 inches) soils over bedrock, whereas the Shallow and Mod-deep Till site has shallow(0-20 inches) and mod-deep soils (20-40 inches). Therefore the Shallow and Moderately-deep Till site produces mixed wood--typically beech, hemlock, and/or red spruce--rather than northern hardwood stands characteristic of Loamy Slopes on deeper soils.
F143XY502ME	**Loamy Till Toeslope** The Loamy Till Toeslope site tends to occur downslope of the Loamy Slopes site, especially when there is a large watershed above. The Loamy Till Toeslope site is wetter and tends to have more more richness indicators and softwood species than Loamy Slope sites.

Table 1. Dominant plant species

Tree	Not specified
Shrub	Not specified
Herbaceous	Not specified

Physiographic features

This site occurs mostly on moderate slopes on till landforms, including hills, mountain sides and drumlins. It may also be found on somewhat flatter till plains and ground moraine landforms. Slopes range from 0-2500 feet above sea level, occasionally extending above 3,000 feet. This site may have a seasonally-high water table within 16-36 inches of the soil surface, but often does not.

Table 2. Representative physiographic features

Landforms	(1) Hill (2) Mountain slope (3) Drumlin
Flooding frequency	None
Ponding frequency	None
Elevation	0–2,500 ft
Slope	2–60%
Aspect	Aspect is not a significant factor

Climatic features

The climate of this site is typical of MLRA 143, with very cold snowy winters, warm rainy summers, and a relatively short growing season. Precipitation is fairly constant from month to month and averages about 47 inches annually. Growing degree days ranges from 112-135 days from June to September.

Table 3. Representative climatic features

Frost-free period (average)	112 days
Freeze-free period (average)	135 days
Precipitation total (average)	47 in

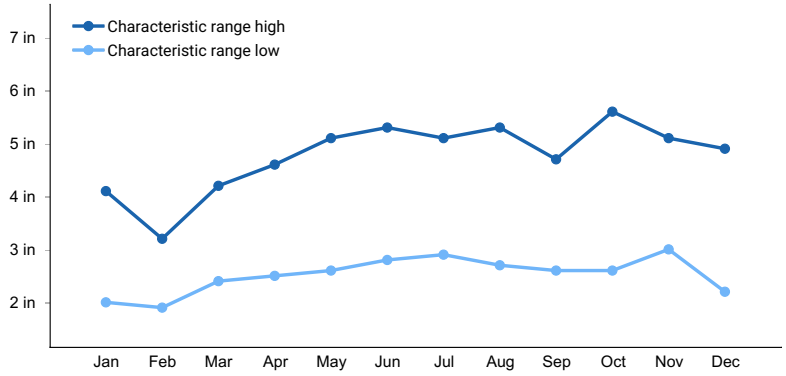

Figure 1. Monthly precipitation range

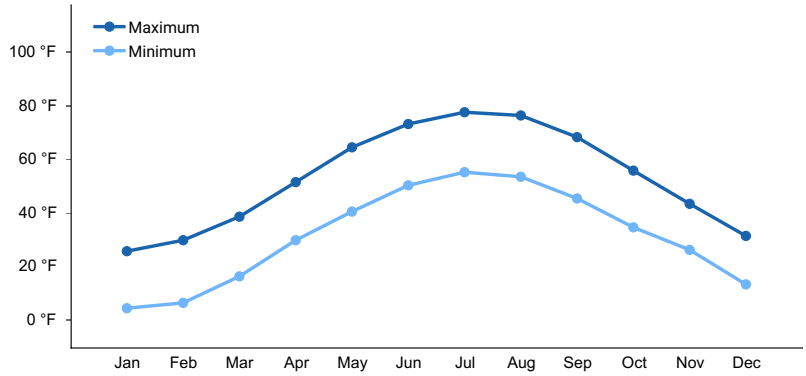

Figure 2. Monthly average minimum and maximum temperature

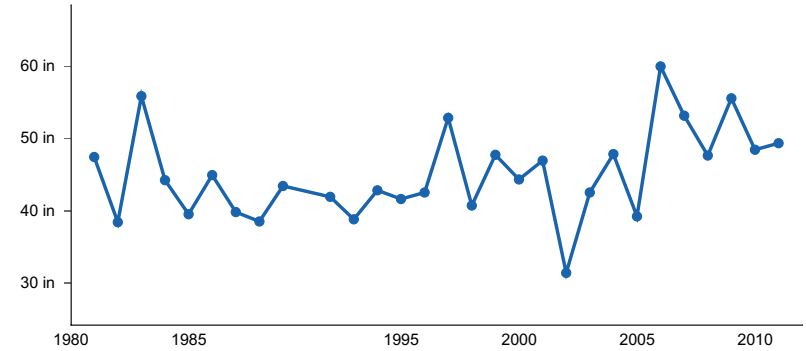

Figure 3. Annual precipitation pattern

Climate stations used

- (1) BRASSUA DAM [USC00170814], Rockwood, ME
- (2) DANFORTH [USC00171833], Danforth, ME
- (3) LONG FALLS DAM [USC00174781], West Central Somerset Co, ME
- (4) WESLEY [USC00179294], Machias, ME
- (5) PLYMOUTH [USC00276945], Campton, NH
- (6) NEWCOMB [USC00305714], Newcomb, NY
- (7) LAKE PLACID 2 S [USC00304555], Lake Placid, NY
- (8) NORTHFIELD [USC00435733], Northfield, VT
- (9) BARNARD [USC00170398], Brownville, ME
- (10) GRAND LAKE STREAM [USC00173261], Northern Washington Co, ME
- (11) FIRST CONNECTICUT LAKE [USC00272999], Pittsburg, NH
- (12) CONKLINGVILLE DAM [USC00301708], Corinth, NY
- (13) WATERBURY 2 SSE [USC00438815], Moretown, VT
- (14) BLANCHARD [USC00170655], Abbot, ME
- (15) ROCHESTER [USC00436893], Rochester, VT
- (16) SOUTH LINCOLN [USC00437612], Bristol, VT

Influencing water features

This site is not typically influenced by streams or wetlands.

Soil features

The soils of this site are mostly well- and moderately well-drained, and may include patches of somewhat poorly-drained soils in association with drier soils. They formed in mostly lodgment till characterized by a layer of densely-compacted soil within 20-43 inches of the soil surface. This restrictive layer limits both root penetration and water percolation on the site, and often has coarser textures and more rock fragments than the upper soil layers.

These soils are typically derived from granite, gneiss, or mica schist, but also occurs in less abundant minerals found in the region. Soil textures range from silt loams to fine sandy loams at the surface, with coarse loamy

subsoils. Soil pH is typically 4.5 to 6.0, but may range from 3.5 to 6.5 at the extremes.

Often this site includes patches of moderately deep soils, with lithic bedrock within 20 to40 inches of the soil surface. In these areas, as well as in wetter drainageways, softwoods tend to be more abundant in the plant community. These patches tend to be embedded within a larger matrix of soils that are more typical of this ecological site.

Table 4. Representative soil features

Parent material	(1) Lodgment till–granite (2) Basal till–gneiss (3) Till–mica schist
Surface texture	(1) Fine sandy loam (2) Silt loam (3) Loam
Family particle size	(1) Loamy
Drainage class	Moderately well drained to well drained
Soil depth	20 in
Surface fragment cover <=3"	0%
Surface fragment cover >3"	0–2%
Available water capacity (0-40in)	1.6–9.6 in
Calcium carbonate equivalent (0-40in)	0%
Electrical conductivity (0-40in)	0–2 mmhos/cm
Sodium adsorption ratio (0-40in)	0
Soil reaction (1:1 water) (0-40in)	3.5–6.5
Subsurface fragment volume <=3" (Depth not specified)	0–20%
Subsurface fragment volume >3" (Depth not specified)	0–10%

Ecological dynamics

This site covers a broad area and will require significant study to identify the full range of disturbances and plant communities associated with it. Northern hardwoods dominate, particularly yellow birch, sugar maple and beech. However, where soils somewhat shallower or wetter than the typical site concept there is often more red spruce, balsam fire, white birch and eastern hemlock present in the community.

Treethrow and logging are the most common disturbances on this site. The site is resilient following these disturbances and succeeds through an herbaceous and shrubby phase prior to tree establishment and eventual return to the reference community. The young forest stands include several species not typically dominant in the reference community, including pin cherry, white birch, aspen, balsam fir, etc.

On gentler slopes, this site may be cultivated for crop or pasture. When cropland or pastureland management ceases, the site either returns to northern hardwoods or may transition to a white pine forest. Once white pine is established, it tends to form a single age stand with low diversity and little understory.

State and transition model

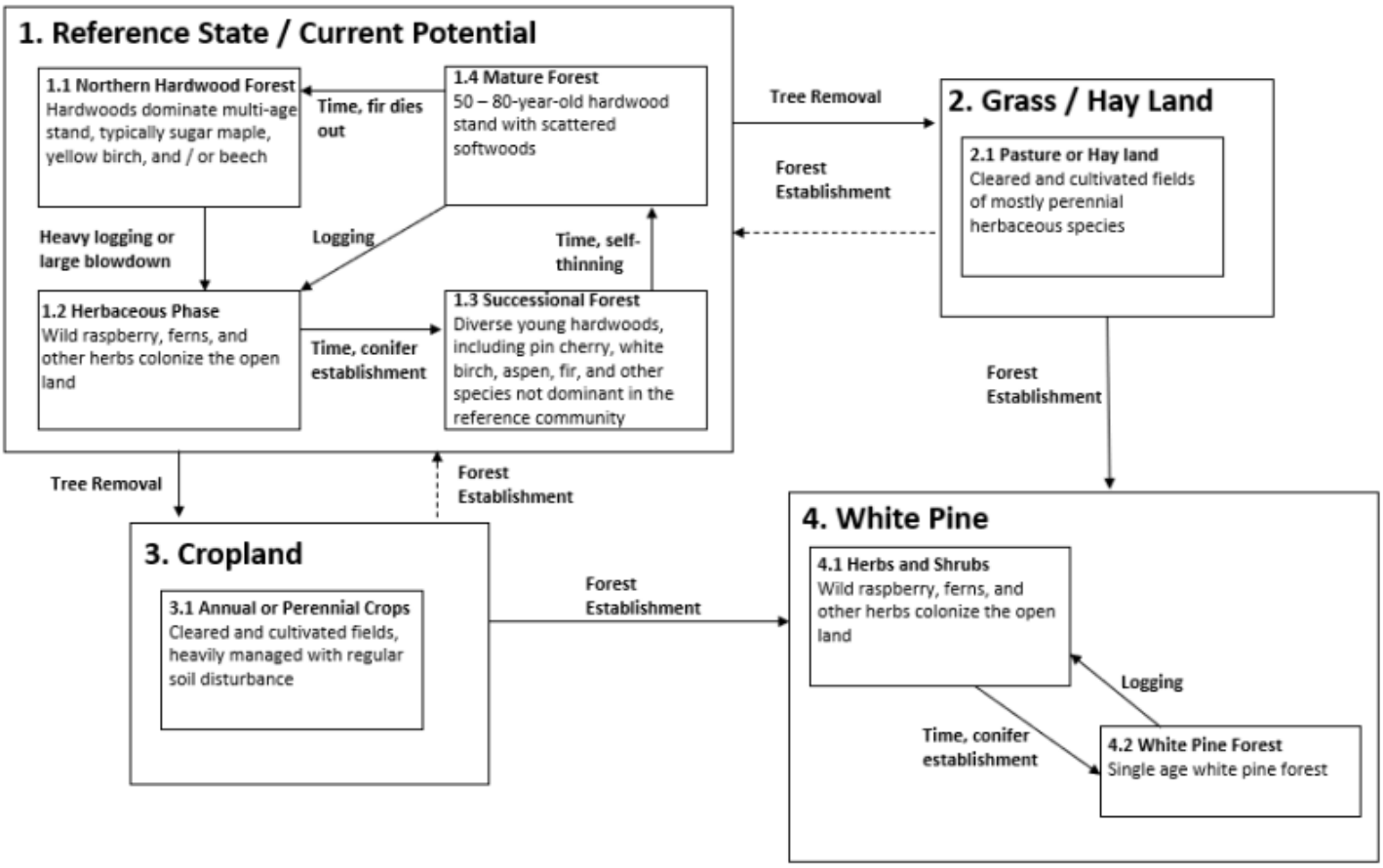

Figure 5. Current State and Transition Model for the F143XY501ME - "Loamy Slope" Ecological Site.

State 1
Reference State (minimally managed)

State 2
Semi-natural State

State 3
Cultural State

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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Nature Conservancy and The New Hampshire Heritage Bureau. University Press of New England, Lebanon, NH.

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.

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Contributors

Jamin Johanson
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Approval

Greg Schmidt, 10/07/2024

Acknowledgments

Nels Barrett

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	05/11/2025
Approved by	Greg Schmidt
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:**

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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:**
