

Ecological site F144AY028MA

Wet Outwash

Last updated: 2/10/2025

Accessed: 05/21/2025

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): 144A–New England and Eastern New York Upland, Southern Part

MLRA 144A: New England and Eastern New York Upland, Southern Part. The eastern half of the eastern part of this MLRA is in the Seaboard Lowland Section of the New England Province of the Appalachian Highlands. The western half of the eastern part and the southeastern half of the western part are in the New England Upland Section of the same province and division. The northwestern half of the western part is in the Hudson Valley Section of the Valley and Ridge Province of the Appalachian Highlands. This MLRA is a very scenic area of rolling to hilly uplands that are broken by many gently sloping to level valleys that terminate in coastal lowlands. Elevation ranges from sea level to 1,000 feet (0 to 305 meters) in much of the area, but it is 2,000 feet (610 meters) on some hills. Relief is mostly about 6 to 65 feet (2 to 20 meters) in the valleys and about 80 to 330 feet (25 to 100 meters) in the uplands.

This area has been glaciated and consists almost entirely of till hills, drumlins, and bedrock-controlled uplands with a mantle of till. It is dissected by narrow glacio-fluvial valleys. The southernmost boundary of the area marks the farthest southward extent of Wisconsinian glaciation on the eastern seaboard. The river valleys and coastal plains are filled with glacial lake sediments, marine sediments, and glacial outwash. The bedrock in the eastern half of the area consists primarily of igneous and metamorphic rocks of early Paleozoic age. Granite is the most common igneous rock, and gneiss, schist, and slate are the most common metamorphic rocks. In the parts of the MLRA in eastern and southeastern New York, Devonian- to Pennsylvanian-age sandstone, shale, and limestone are dominant. Carbonate rocks, primarily dolomite and limestone, are the dominant kinds of bedrock in the part of this MLRA in northwestern Connecticut.

Classification relationships

HIERARCHICAL CLASSIFICATION RELATIONSHIPS

USDA-NRCS (USDA 2006):

Land Resource Region (LRR): N—East and Central Farming and Forest Region

Major Land Resource Area (MLRA): 144A— New England and Eastern New York Upland, Southern Part.

USDA-FS (Cleland et al. 2007)

Province: 221 - Eastern Broadleaf Province

Section: 221A - Lower New England

Subsection: 221Aa – Boston Basin

221Ac – Narragansett-Bristol Lowland and Islands

221Ad – Southern New England Coastal Lowland

221Ae – Hudson Highlands

221Ag - Southeast New England Coastal Hills and Plains

221Ah - Worcester-Monadnock Plateau

221Ai – Gulf of Maine Coastal Plain

221Ak - Gulf of Maine Coastal Lowland

Section: 221B – Hudson Valley

Subsection: 221Ba – Hudson Limestone Valley

221Bb - Miami – Taconic Foothills

221Bc – Hudson Glacial Lake Plains

Ecological site concept

The Wet Outwash ecological site consists of very deep, poorly drained sandy to loamy soils formed in outwash and stratified drift. They are nearly level to gently sloping soils in low-lying positions on terraces and plains. Representative soils include Walpole, Wareham, Raypol, Mashpee, Massasoit.

The plant community is highly variable. Representative plant communities are typically dominated by red maple and or blackgum with a dense shrub layer. Other community-types include Atlantic white cedar. and red spruce swamps.

Associated sites

F144AY027MA	Moist Sandy Outwash
F144AY031MA	Very Wet Outwash

Similar sites

F144AY017NH	Well Drained Lake Plain
R144AY046RI	Subaqueous Freshwater Organic Deposits

Table 1. Dominant plant species

Tree	(1) <i>Acer rubrum</i> (2) <i>Nyssa sylvatica</i>
Shrub	(1) <i>Vaccinium corymbosum</i>
Herbaceous	Not specified

Physiographic features

This site occurs across a variety of landforms in plains and is not subject to flooding.

Table 2. Representative physiographic features

Landforms	(1) Coastal plain > Delta (2) Lake plain > Depression (3) Outwash plain > Terrace (4) Drainageway (5) Ground moraine (6) Marine terrace (7) Outwash plain (8) Outwash terrace
Runoff class	Negligible to very high
Flooding frequency	None
Ponding frequency	None to frequent
Elevation	0–305 m
Slope	0–8%
Water table depth	5–30 cm
Aspect	Aspect is not a significant factor

Climatic features

The Koppen-Geiger climate classification of the area in which this MLRA occurs varies between Dfb (Warm-summer humid continental) in the North, and Dfa (Hot-summer humid continental) in the southern portion of the MLRA. Precipitation is usually uniformly distributed throughout the year. Near the coast, however, it is slightly lower in summer. Precipitation is slightly higher in spring and fall in inland areas. Rainfall occurs as high-intensity, convective thunderstorms during the summer. During the winter, most of the precipitation occurs as moderate-intensity storms (northeasters) that produce large amounts of rain or snow. The freeze-free period increases in length to the south.

Table 3. Representative climatic features

Frost-free period (characteristic range)	126-142 days
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Freeze-free period (characteristic range)	148-188 days
Precipitation total (characteristic range)	1,118-1,219 mm
Frost-free period (actual range)	116-159 days
Freeze-free period (actual range)	146-203 days
Precipitation total (actual range)	1,041-1,245 mm
Frost-free period (average)	136 days
Freeze-free period (average)	170 days
Precipitation total (average)	1,168 mm

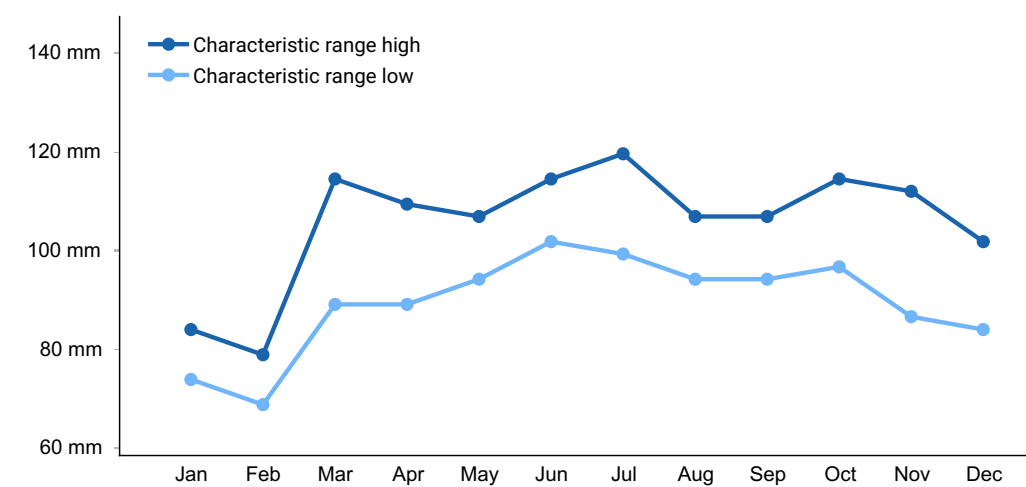


Figure 1. Monthly precipitation range

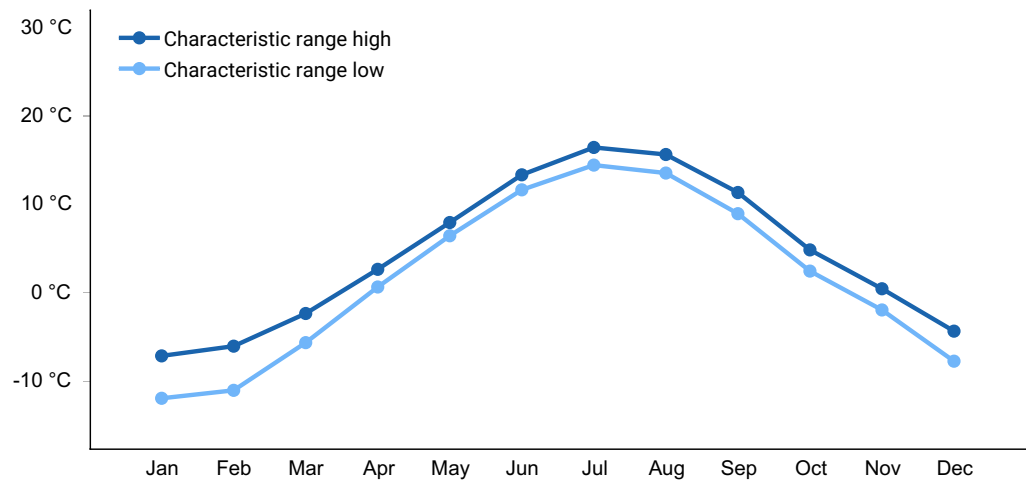


Figure 2. Monthly minimum temperature range

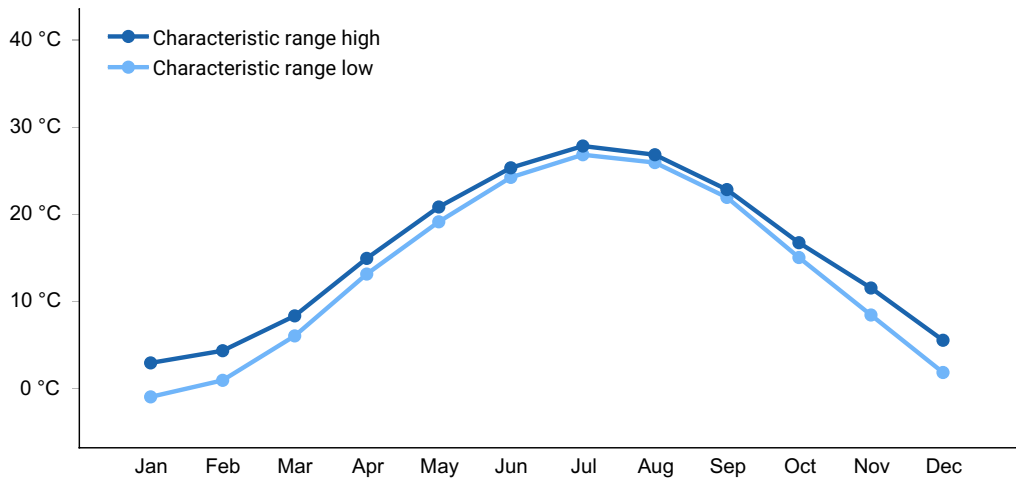


Figure 3. Monthly maximum temperature range

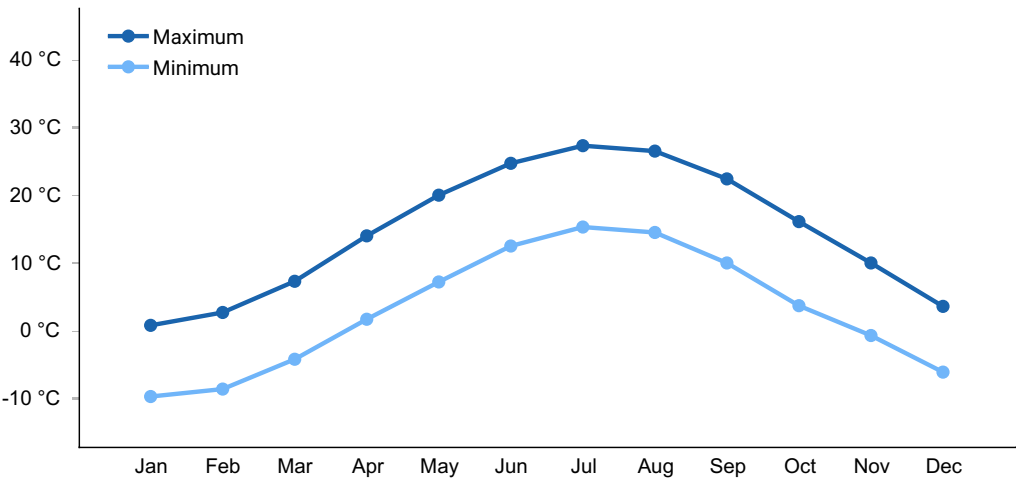


Figure 4. Monthly average minimum and maximum temperature

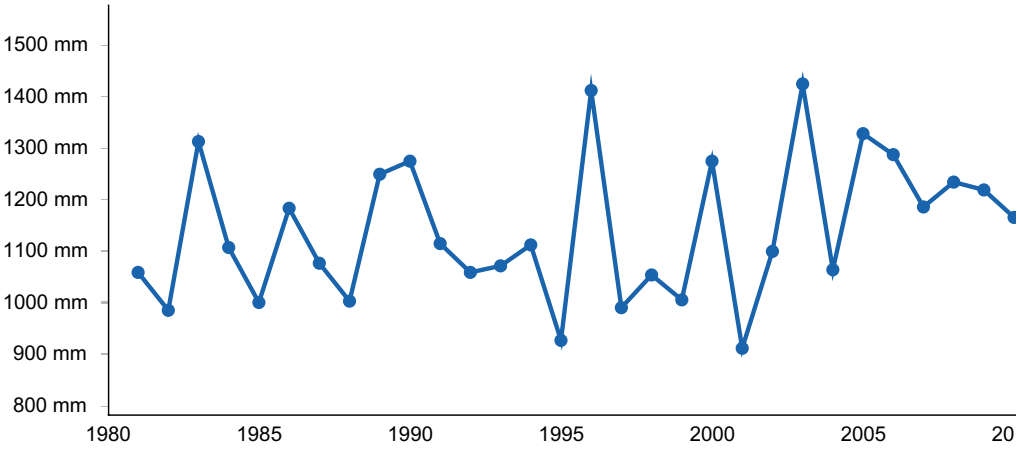


Figure 5. Annual precipitation pattern

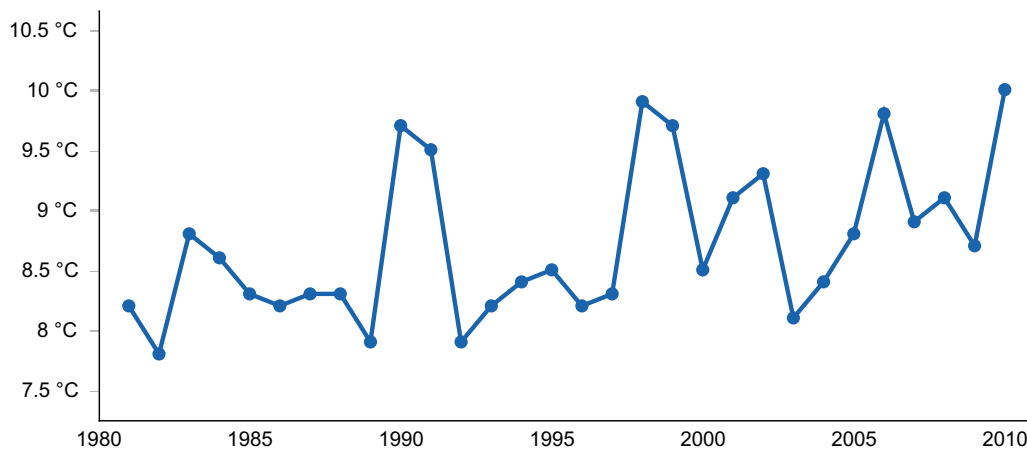


Figure 6. Annual average temperature pattern

Climate stations used

- (1) ORANGE MUNI AP [USW00054756], Orange, MA
- (2) RUTLAND [USC00436995], Rutland, VT
- (3) GLOVERSVILLE [USC00303319], Gloversville, NY
- (4) MILLBROOK 3 W [USW00064756], Millbrook, NY
- (5) BELVIDERE BRG [USC00280734], Bangor, NJ
- (6) GROTON NEW LONDON AP [USW00014707], Groton, CT
- (7) PLYMOUTH MUNI AP [USW00054769], Carver, MA
- (8) DURHAM 2 SSW [USW00054795], Durham, NH

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.

Wetland description

National Wetland Classification (Cowardin et al., 1979):

Palustrine, class variable, leaf morphology variable, water regime variable, chemistry modifier variable.

Soil features

This site consists of shallow to very deep, poorly drained soils formed from wind or water deposited materials. Representative soils are Walpole, Mashpee, Massasoit, Raypol, and Wareham.

Table 4. Representative soil features

Parent material	(1) Eolian deposits—granite and gneiss (2) Glaciofluvial deposits—igneous and sedimentary rock (3) Lacustrine deposits—schist (4) Glaciolacustrine deposits (5) Glaciomarine deposits (6) Outwash
Surface texture	(1) Sand (2) Silt loam (3) Loamy sand (4) Fine sandy loam (5) Very fine sandy loam (6) Loamy fine sand
Family particle size	(1) Coarse-loamy (2) Coarse-loamy over clayey (3) Coarse-loamy over sandy or sandy-skeletal (4) Sandy
Drainage class	Poorly drained
Permeability class	Slow to rapid
Depth to restrictive layer	33–183 cm
Surface fragment cover ≤3"	0%
Surface fragment cover >3"	0–2%
Available water capacity (Depth not specified)	2.54–17.78 cm
Soil reaction (1:1 water) (Depth not specified)	3.5–8.4
Subsurface fragment volume ≤3" (Depth not specified)	0–30%
Subsurface fragment volume >3" (Depth not specified)	0–6%

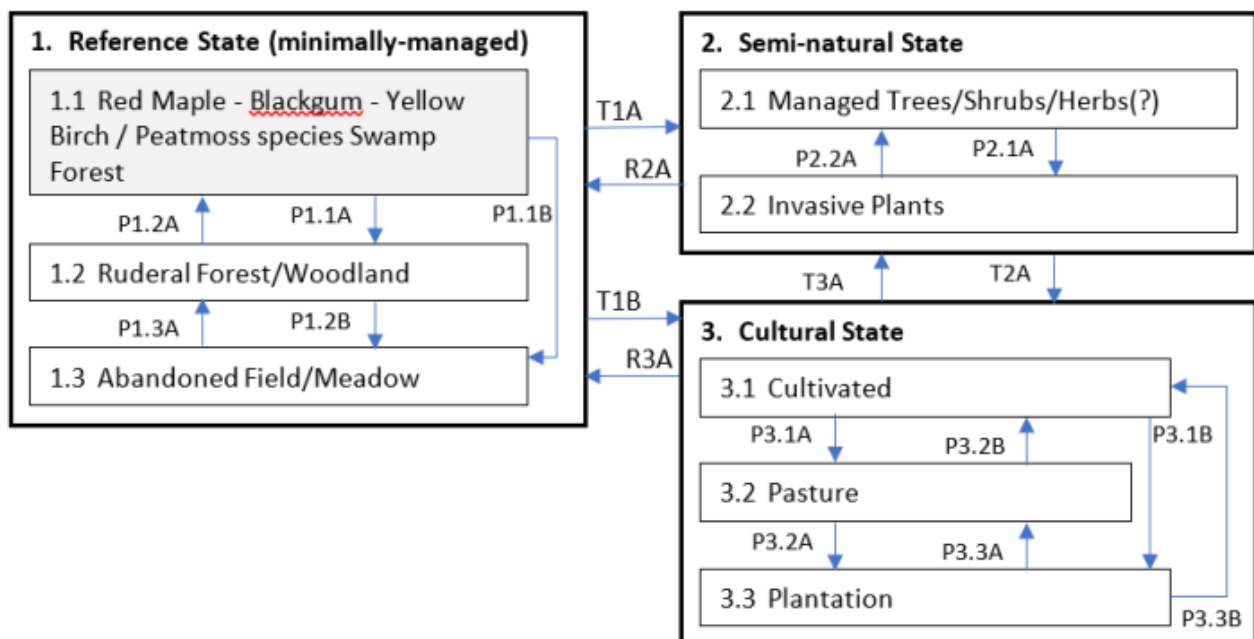
Ecological dynamics

The Wet Outwash ecological site is characteristic of the North-Central Appalachian Acidic Swamp system (CES202.604). Representative plant communities are typically dominated by red maple and or blackgum with a dense shrub layer. Other community types in Atlantic white cedar swamps, and red spruce swamps. Natural disturbances include

climate extremes such as, excessive droughts, or storm activity ranging from windthrows to downbursts to ice-storms. Other agents-of-change include land conversions and fragmentation by agricultural, development and logging. Where they occur, Atlantic White cedar swamps are considered a successional community. Invasive plants include reedgrass (*Phragmites australis* ssp. *australis*), multiflora rose (*Rosa multiflora*), Asiatic bittersweet (*Celastrus orbiculatus*), and Norway spruce (*Picea abies*).

State and transition model

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Transition	Drivers/practices
T1A	Forest mgmt., Disturbance
T1B, T2A	Disturbance/cutting/clearing, Brush removal
R2A, R2B	Restoration & <u>Mgmt.</u> Forest Stand Improvement, Early Successional Habitat Development, Upland Wildlife <u>Mgmt.</u> Invasive spp. Control, Plant establishment
T3A	Abandonment, Plant establishment, Forest mgmt.
P2.1A	Disturbance, Invasive species establishment
P2.2A	Invasive spp. Control, Forest mgmt..
P1.3A, P1.2A	Abandonment, succession
P3.1A, P3.2A, P3.3A, P3.1B, P3.2B, P3.3B	Changing agricultural phases
P1.1A, P1.1B, P1.2B	Disturbance, Early Successional Habitat Development

State 1

Reference State (Minimally-managed)

The reference state includes: • *Acer rubrum* - *Nyssa sylvatica* - *Betula alleghaniensis* /

Sphagnum spp. Swamp Forest Translated Name: Red Maple - Blackgum - Yellow Birch / Peatmoss species Swamp Forest Common Name: Red Maple - Blackgum Basin Swamp Forest (CEGL006014) Other forested communities may include: • *Acer rubrum* / *Rhododendron viscosum* - *Clethra alnifolia* Swamp Forest Translated Name: Red Maple / Swamp Azalea - Coastal Sweet-pepperbush Swamp Forest Common Name: Lower New England Red Maple Swamp Forest (CEGL006156) • *Picea rubens* - *Acer rubrum* / *Ilex mucronata* Swamp Forest Translated Name: Red Spruce - Red Maple / Catberry Swamp Forest Common Name: Red Spruce - Red Maple Acidic Swamp Forest (CEGL006198) • *Pinus rigida* / *Chamaedaphne calyculata* / Sphagnum spp. Swamp Woodland Translated Name: Pitch Pine / Leatherleaf / Peatmoss species Swamp Woodland Common Name: Pitch Pine Bog (CEGL006194) Along the coast, a successional community may include: • *Chamaecyparis thyoides* / *Ilex glabra* - *Rhododendron viscosum* Swamp Forest Translated Name: Atlantic White-cedar / Inkberry - Swamp Azalea Swamp Forest Common Name: Coastal Plain Atlantic White-cedar Swamp Forest (CEGL006188) • *Chamaecyparis thyoides* / *Rhododendron maximum* Swamp Forest (Atlantic White-cedar / Great Laurel Swamp Forest) Common name: Atlantic White-cedar / Great Laurel Swamp Forest (CEGL006355)

Community 1.1

: Red Maple - Blackgum - Yellow Birch / Peatmoss species Swamp Forest (CEGL006014)

Acer rubrum - *Nyssa sylvatica* - *Betula alleghaniensis* / Sphagnum spp. Swamp Forest Translated Name: Red Maple - Blackgum - Yellow Birch / Peatmoss species Swamp Forest Common Name: Red Maple - Blackgum Basin Swamp Forest (CEGL006014) The dominant trees are red maple (*Acer rubrum*) and black gum (*Nyssa sylvatica*). Yellow birch (*Betula alleghaniensis*), eastern hemlock (*Tsuga canadensis*), white pine (*Pinus strobus*), and to the north red spruce (*Picea rubens*) may be minor canopy associates. The most abundant shrubs are common winterberry (*Ilex verticillata*) and highbush blueberry (*Vaccinium corymbosum*); associated shrub species include, mountain holly (*Ilex mucronata* [= *Nemopanthus mucronatus*]), sheep laurel (*Kalmia angustifolia*), leatherleaf (*Chamaedaphne calyculata*), maleberry (*Lyonia ligustrina*), white meadowsweet (*Spiraea alba* var. *latifolia* [= *Spiraea latifolia*]), and common buttonbush (*Cephalanthus occidentalis*). Cinnamon fern (*Osmunda cinnamomea*) is the characteristic dominant in the herb layer, with royal fern (*Osmunda regalis*), marsh fern (*Thelypteris palustris*), Virginia chainfern (*Woodwardia virginica*), rattlesnake manna grass (*Glyceria canadensis*), threeleaf goldthread (*Coptis trifolia* [= *C. groenlandica*]), prickly bog sedge (*Carex atlantica*), three-seeded sedge (*Carex trisperma*), northern long sedge (*Carex folliculate*), greater bladder sedge (*Carex intumescens*), water arum (*Calla palustris*), Virginia marsh-St.-John's-wort (*Triadenum virginicum*), and possibly skunk cabbage (*Symplocarpus foetidus*). Mosses are primarily Sphagnum spp.. (Source: NatureServe 2018 [accessed 2019], USNVC 2017 [accessed 2019]). Cross-referenced plant community concepts (typically by political State): CT: Red maple / common winterberry – highbush blueberry Swamp (Metzler and Barrett, 2006) MA: Red maple - black gum Swamp (Swain and Kearsley, 2001) NH: Black gum - red maple Swamp (Sperduto and Nichols, 2011) NY:

Red maple – deciduous shrub Swamp (Edinger et al., 2014) RI: Red maple – black gum Swamp (Enser and Lundgren, 2006)

Dominant plant species

- red maple (*Acer rubrum*), tree
- northern red oak (*Quercus rubra*), tree
- highbush blueberry (*Vaccinium corymbosum*), shrub
- cinnamon fern (*Osmunda cinnamomea*), other herbaceous

Community 1.2

Ruderal Forest/Woodland

Community 1.3

Abandoned Field/Meadow

Pathway P1.1A

Community 1.1 to 1.2

Disturbance, early successional habitat development

Pathway P1.1B

Community 1.1 to 1.3

Disturbance, early successional habitat development

Pathway P1.2A

Community 1.2 to 1.1

Abandonment, succession

Pathway P1.2B

Community 1.2 to 1.3

Disturbance, early successional habitat development

Pathway P1.3A

Community 1.3 to 1.2

Abandonment, succession

State 2

Semi-natural State

The Semi-natural State would expect plant communities where ecological processes are primarily operating with some land conditioning in the past or present, e.g., managed forests, or plant communities that are an artifact of land management e.g., predominately invasive plants.

Community 2.1

Managed trees/shrubs/herbs(?)

Community 2.2

Invasive Plants

Pathway P2.1A

Community 2.1 to 2.2

Disturbance, invasive species management

Pathway P2.2A

Community 2.2 to 2.1

Invasive species control, forest management

State 3

Cultural State

The Cultural State would expect the ecological site to be very strongly conditioned by land management conversion, by transformation to Cultivated/Pasture/Plantation.

Community 3.1

Cultivated

Community 3.2

Pasture

Community 3.3

Plantation

Pathway P3.1A

Community 3.1 to 3.2

Changing agricultural phases

Pathway P3.1B

Community 3.1 to 3.3

Changing agricultural phases

Pathway P3.2A

Community 3.2 to 3.1

Changing agricultural phases

Pathway P3.2B

Community 3.2 to 3.3

Changing agricultural phases

Pathway P3.3A

Community 3.3 to 3.1

Changing agricultural phases

Pathway P3.3B

Community 3.3 to 3.2

Changing agricultural phases

Transition T1A

State 1 to 2

Forest management, disturbance

Transition T1B

State 1 to 3

Disturbance/cutting/clearing, brush removal

Restoration pathway R2A

State 2 to 1

Restoration and management, forest stand improvement, early successional habitat development, upland wildlife management, invasive species control, plant establishment

Transition T2A

State 2 to 3

Disturbance/cutting/clearing, brush removal

Restoration pathway R3A

State 3 to 1

Restoration and management, forest stand improvement, early successional habitat development, upland wildlife management, invasive species control, plant establishment

Transition T3A

State 3 to 2

Abandonment, plant establishment, forest management

Additional community tables

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

Nels Barrett, Ph.D. (vegetation)

Approval

Nels Barrett, 2/10/2025

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Michael Margo and tech team provided earlier drafts. Josh Hibit made compliance updates w/ 2021 Checklist V.2

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	02/10/2025
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:**
-

17. **Perennial plant reproductive capability:**
-