USDA Natural Resources
Conservation Service

Ecological site F144AY031MA
Very Wet Outwash

Last updated: 10/04/2024
Accessed: 05/12/2025

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

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 Very Wet Outwash site consists of very deep, very poorly drained soils in sandy glaciofluvial deposits on outwash plains, deltas, and terraces. They are nearly level soils in depressions. Hydraulic conductivity is often high. Representative soils are Preakness, Birdsall, and Scarboro. Representative plant communities are similar to-, but more open than- the Wet Outwash ecological site. It is typically dominated by red maple and or Atlantic white cedar with a less dense ground cover, sometimes with Atlantic white cedar in admixture or dominance.

Associated sites

F144AY028MA	**Wet Outwash**

Similar sites

F144AY009CT	**Wet Till Depressions**
F144AY015NY	**Wet Silty Low Floodplain**

Table 1. Dominant plant species

Tree	(1) *Acer rubrum*
Shrub	(1) *Clethra alnifolia*
Herbaceous	Not specified

Physiographic features

This site occurs on a variety of relatively flat landforms that are not subject to flooding.

Table 2. Representative physiographic features

Landforms	(1) Coastal plain > Depression (2) Lake plain > Drainageway (3) Outwash plain > Flat (4) Valley > Terrace (5) Outwash plain (6) Outwash terrace
Runoff class	Negligible to low
Flooding frequency	None
Ponding frequency	None to frequent
Elevation	0–2,099 ft
Slope	0–3%
Water table depth	0–6 in
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)	126-145 days
Freeze-free period (characteristic range)	148-188 days
Precipitation total (characteristic range)	43-48 in
Frost-free period (actual range)	116-173 days
Freeze-free period (actual range)	146-208 days
Precipitation total (actual range)	41-48 in
Frost-free period (average)	140 days
Freeze-free period (average)	173 days
Precipitation total (average)	45 in

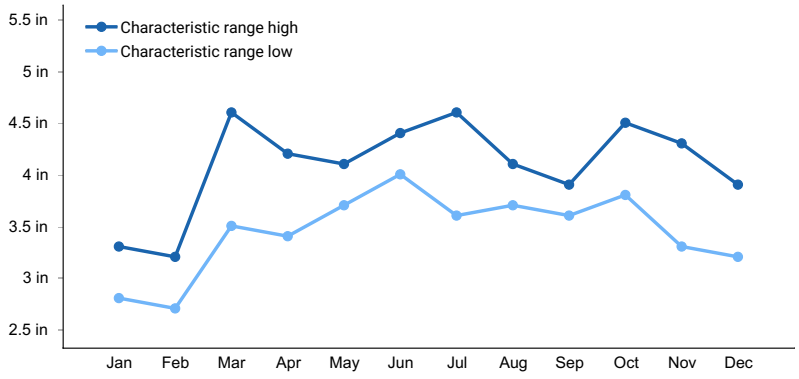


Figure 1. Monthly precipitation range

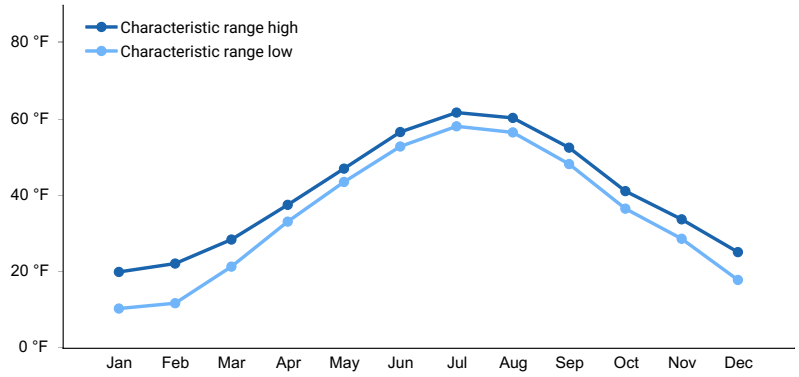


Figure 2. Monthly minimum temperature range

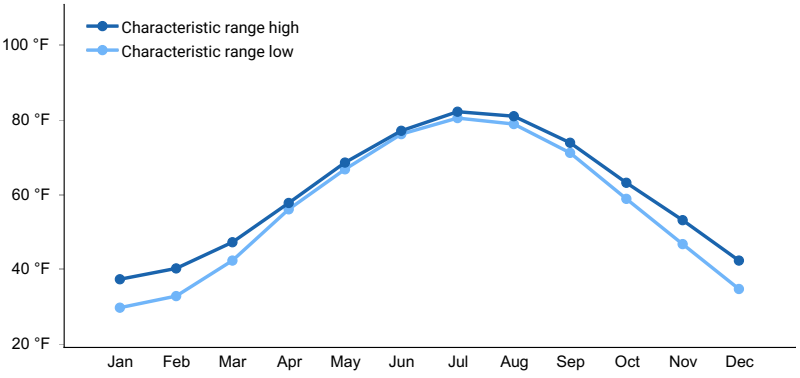


Figure 3. Monthly maximum temperature range

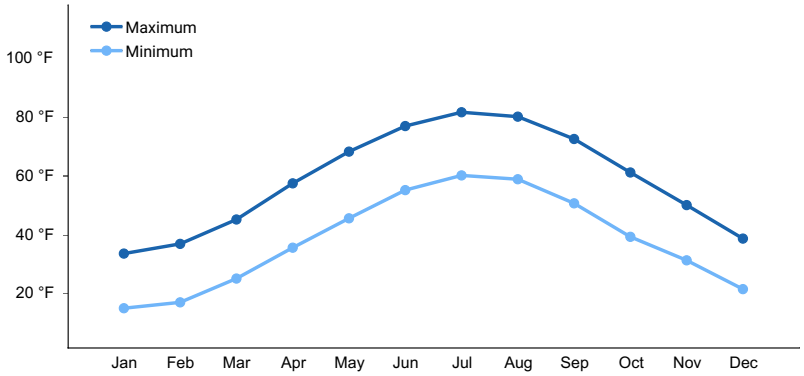


Figure 4. Monthly average minimum and maximum temperature

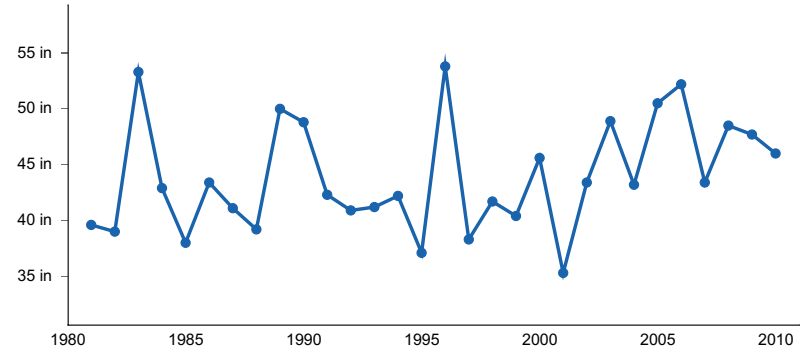


Figure 5. Annual precipitation pattern

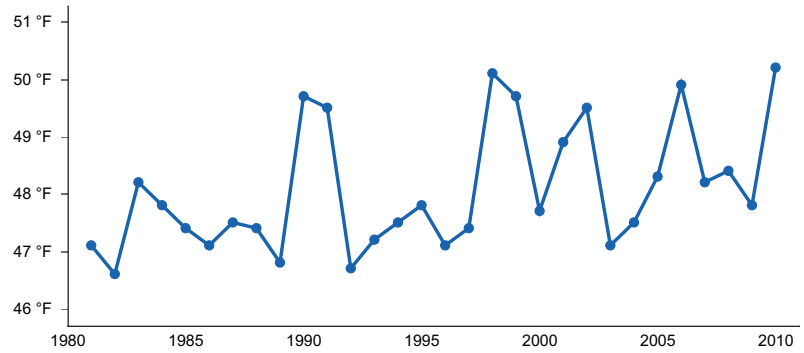


Figure 6. Annual average temperature pattern

Climate stations used

- (1) RUTLAND [USC00436995], Rutland, VT
- (2) GLOVERSVILLE [USC00303319], Gloversville, NY
- (3) ORANGE MUNI AP [USW00054756], Orange, MA
- (4) NEW BEDFORD MUNI AP [USW00094726], New Bedford, MA
- (5) DURHAM 2 SSW [USW00054795], Durham, NH
- (6) BRIDGEPORT SIKORSKY MEM AP [USW00094702], Stratford, CT
- (7) BELVIDERE BRG [USC00280734], Bangor, NJ

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.

Very poorly drained
Water is removed from the soil so slowly that free water remains at or very near the surface during much of the growing season. Internal free water occurrence is very shallow and persistent or permanent. Unless the soil is artificially drained, most mesophytic crops cannot be grown. The soils are commonly level or depressed and frequently ponded. In areas where rainfall is high or nearly continuous, slope gradients may be greater.

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 moderate to very deep, poorly to very poorly drained soils formed in water, wind, and glacially deposited sediments. Representative soils are Birdsall, Preakness, and Scarboro.

Table 4. Representative soil features

Parent material	(1) Eolian deposits–basalt (2) Ablation till–conglomerate (3) Outwash–granite and gneiss (4) Glaciofluvial deposits–sandstone (5) Glaciolacustrine deposits–schist (6) Lacustrine deposits
Surface texture	(1) Mucky silt loam (2) Silt loam (3) Muck (4) Sandy loam (5) Mucky fine sandy loam (6) Stony, mucky loamy sand
Family particle size	(1) Coarse-loamy (2) Coarse-silty (3) Sandy (4) Sandy over clayey
Drainage class	Very poorly drained to poorly drained
Permeability class	Very slow to rapid
Depth to restrictive layer	23–72 in
Surface fragment cover <=3"	0%
Surface fragment cover >3"	0–2%
Available water capacity (Depth not specified)	3–9 in
Soil reaction (1:1 water) (Depth not specified)	4.5–7.3
Subsurface fragment volume <=3" (Depth not specified)	0–52%
Subsurface fragment volume >3" (Depth not specified)	0–10%

Ecological dynamics

[Caveat: The vegetation information contained in this section and is only provisional, based on concepts, not yet validated with field work.*]

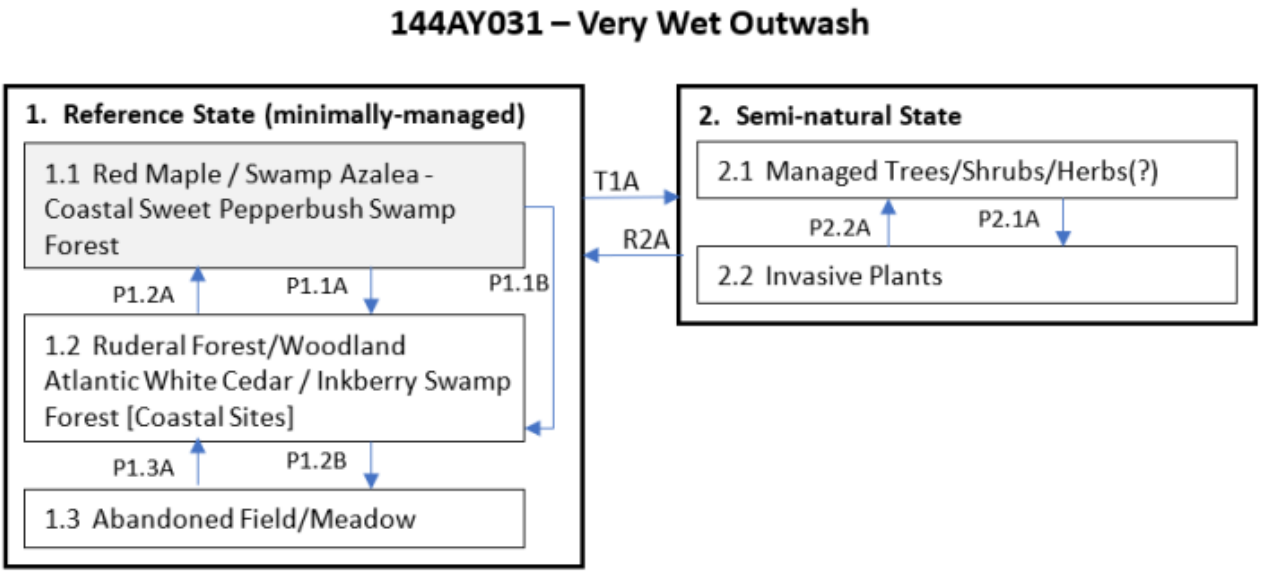
The vegetation groupings described in this section are based on the terrestrial ecological system classification and vegetation associations developed by NatureServe (Comer 2003). Terrestrial ecological SYSTEMS are specifically defined as a group of plant community-types called ASSOCIATIONS that tend to [co-]occur within landscapes with similar ecological processes, substrates, and/or environmental gradients. Any given system will typically manifest itself in a landscape at intermediate geographic scales of tens-to-thousands of hectares and will persist for 50 or more years. A vegetation association is a plant community that is much more specific to a given soil, geology, landform, climate, hydrology, and disturbance history. It is the basic unit for vegetation classification and recognized by the US National Vegetation Classification (US FDGC 2008). Each association will be named by the diagnostic and often dominant species that occupy the different height strata (tree, sapling, shrub, and herb). Within the NatureServe Explorer database (NatureServe, 2015), ecological systems are numbered by a Community Ecological System Code (CES) and individual vegetation associations are assigned an identification number called a Community Element Global Code (CEGL).

Additional and more localized vegetation information is provided by the State Natural Heritage Programs of Connecticut (Metzler and Barrett 2001), Massachusetts (Swain and Kearsley 2001), New Hampshire (Sperduto and Nichols, 2011), New York (Edinger et al., 2014), and Rhode Island (Enser and Lungren, 2006).

The Very 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. Another community type located closer to the coast is an Atlantic white cedar swamp. 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. Altlantic White cedar swamps are considered a successional community. Invasive plants include Invasive plants include purple loosestrife (*Lythrum salicaria*), reedgrass (*Phragmites australis* ssp. australis).

[*Caveat] The information presented is representative of very complex vegetation communities. Key indicator plants and ecological processes are described to help inform land management decisions. Plant communities will differ across the MLRA because of the naturally occurring variability in weather, soils, and geography. The reference plant community is not necessarily the management goal. The drafts of species lists are merely representative and are not botanical descriptions of all species occurring, or potentially occurring, on this site. They are not intended to cover every situation or the full range of conditions, species, and responses for the site.

State and transition model



Transition	*Drivers/practices*
T1A	Forest mgmt., Disturbance
R2A	Restoration & Mgmt, Forest Stand Improvement, Early Successional Habitat Development, Upland Wildlife Mgmt, Invasive spp. Control, Plant establishment
P2.1A	Disturbance, Invasive species establishment
P2.2A	Invasive spp. Control, Forest mgmt..
P1.3A, P1.2A	Abandonment, succession
P1.1A, P1.2B	Disturbance, Early Successional Habitat Development

State 1
Reference State (Minimally-managed)

The reference community type is characterized by: • *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) Other forested communities may include: • *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) • *Pinus rigida* / *Chamaedaphne calyculata* / Sphagnum spp. Swamp Woodland Translated Name: Pitch Pine / Leatherleaf / Peatmoss species Swamp Woodland Common Name: Pitch Pine Bog (CEGL006194) Following major disturbances 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 / Swamp Azalea - Coastal Sweet-pepperbush Swamp Forest (CEGL006156)

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) These swamps occur in poorly drained depressions that does not receive substantial nutrient input from overland flow or groundwater seepage. Red maple (*Acer rubrum*) dominates the canopy. Other common species that generally occur in low abundance include yellow birch (*Betula alleghaniensis*), ashes (Fraxinus spp.), American elm (*Ulmus americana*), blackgum (*Nyssa sylvatica*), eastern hemlock (*Tsuga canadensis*), or white pine (*Pinus strobus*). The shrub layer is well-developed and often dense. Highbush blueberry (*Vaccinium corymbosum*) and common winterberry (*Ilex verticillata*) are common and abundant. Sweet pepperbush (*Clethra alnifolia*), speckled alder (*Alnus incana*), northern spicebush (*Lindera benzoin*), northern arrowwood (*Viburnum dentatum* var. ludium), southern arrowwood (*Viburnum dentatum* var. venosum), white meadowsweet (*Spiraea alba* var. latifolia [= Spiraea latifolia]), swamp rose (*Rosa palustris*), mountain holly (Ilex mucronate [=Nemopanthus mucronatus]), and swamp azalea (*Rhododendron viscosum*) are frequent but less abundant, and on the Atlantic Coastal Plain inkberry (*Ilex glabra*), great laurel (*Rhododendron maximum*), and dog laurel (Leucothoe racemosa) may also be present. The herbaceous layer has scattered herbs and commonly includes cinnamon fern (*Osmunda cinnamomea*), skunk cabage (*Symplocarpus foetidus*), American false hellebore (*Veratrum viride*), marsh fern (*Thelypteris palustris*), crested wood fern (*Dryopteris cristata*), northern water horehound (*Lycopus uniflorus*), jewelweed (*Impatiens capensis*), water arum (*Calla palustris*), long stem sedge (Carex folliculate), tussock sedge (*Carex stricta*), greater bladder sedge (*Carex intumescens*), royal fern (*Osmunda regalis*), and sensitive fern (*Onoclea sensibilis*). Hummock-and-hollow microtopography is often evident. Mosses are primarily Sphagnum spp.. 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 – hardwood Swamp (Edinger et al., 2014) RI: Red maple – deciduous shrub 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 Atlantic White Cedar / Inkberry Swamp Forest

• *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) This Atlantic white-cedar swamp is dominated by Atlantic white cedar (*Chamaecyparis thyoides*) or codominated with red maple (*Acer rubrum*). Less frequent canopy associates include pitch pine (*Pinus rigida*), black gum (*Nyssa sylvatica*), and sometimes eastern hemlock (*Tsuga canadensis*) and white pine (*Pinus strobus*). The shrub layer is very dense and diverse with sweet pepperbush (*Clethra alnifolia*), inkberry (*Ilex glabra*), northern bayberry (*Morella pensylvanica* [= Myrica pensylvanica]),blue huckleberry (*Gaylussacia frondosa*), swamp deciduous dog laurel (Eubotrys racemosa [=Leucothoe racemose]), swamp azalea (*Rhododendron viscosum*), smooth winterberry (*Ilex laevigata*), common winterberry (Ilex verticillate), black chockberry (*Aronia melanocarpa*), and highbush blueberry (*Vaccinium corymbosum*). The herbaceous layer tends to be sparse or patchy and limited to sunny openings with cinnamon fern (*Osmunda cinnamomea*), marsh fern (*Thelypteris palustris*), Virginia chain fern (*Woodwardia virginica*), netted chain fern (Woodwardia areolate), Massachusett's fern (Thelypteris simulate), eastern teaberry (*Gaultheria procumbens*), sundews (Drosera spp.), purple pitcherplant (*Sarracenia purpurea*), rose pogonia (*Pogonia ophioglossoides*), partridgeberry (*Mitchella repens*), Wlter's sedge (*Carex striata*),northern long sedge (Carex folliculate), prickly bog sedge (*Carex atlantica*), and poison ivy (*Toxicodendron radicans*). The nonvascular layer includes several species of Sphagnum moss. Cross-referenced plant community concepts (typically by political State): CT: Atlantic white cedar / swamp azalea Swamp (Metzler and Barrett, 2006) MA: Coastal Atlantic White Cedar Swamp (Swain and Kearsley, 2001) NH: Atlantic white cedar - yellow birch - pepperbush swamp (Sperduto and Nichols, 2011) NY: Coastal plain Atlantic white cedar swamp (Edinger et al., 2014) RI: Atlantic White Cedar Swamp (Enser and Lundgren, 2006)

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

Different phase of intense land use - may be cultivated crops, such as cranberries.

Community 3.1
Cranberries

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

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

Greg Schmidt, 10/04/2024

Acknowledgments

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	05/12/2025
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:**

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:

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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:**
