USDA Natural Resources Conservation Service

Ecological site F144AY010NH
Sandy High Floodplain

Last updated: 10/04/2024
Accessed: 05/11/2025

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 in much of the area, but it is 2,000 feet on some hills. Relief is mostly about 6 to 65 feet in the valleys and about 80 to 330 feet 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 site consists of deep, coarse-loamy, well drained, alluvial soils on high floodplains of mostly large and medium sized river valleys. The site is flooded less frequently or for a shorter duration than low floodplains. Representative soils are Occum and Wappinger.

The reference community is a sugar maple - white ash (*Acer saccharum* - *Fraxinus americana*) forest with associated plants including American elm (*Ulmus americana*), bitternut hickory (Carys cordiformis), American bladdernut (*Staphylea trifolia*), ostrich fern (*Matteuccia struthiopteris*), and sedges such as Sprengel's sedge (*Carex sprengelii*). Unlike low floodplain forests, silver maple is absent from this community. Limited examples of this forest type exist since they have mostly been converted to agricultural use.

River types such as large, low gradient and small-medium low and high gradient rivers differ in hydrologic regime and fluvial geomorphology and consequently have different community composition (Marks et al. 2011).

Associated sites

F144AY006CT	**High Floodplain Levee**
F144AY015NY	**Wet Silty Low Floodplain**

Similar sites

F144AY027MA	**Moist Sandy Outwash**

Table 1. Dominant plant species

Tree	(1) *Acer saccharum* (2) *Fraxinus americana*
Shrub	Not specified
Herbaceous	(1) *Carex sprengelii*

Physiographic features

The site occurs on high floodplains of mostly large to medium sized river valleys. The site is flooded less frequently or for a shorter duration than low floodplains.

Table 2. Representative physiographic features

Landforms	(1) Hills > Drumlin (2) Till plain > Ground moraine (3) Upland > Till plain (4) Hill (5) Drumlinoid ridge (6) Ridge (7) Knoll (8) Mountain (9) Hillslope
Runoff class	Negligible to very high
Flooding frequency	None to very rare
Ponding frequency	None
Elevation	0–2,017 ft

Slope	0–60%
Water table depth	12–72 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) to the southern portion of the MLRA. Precipitation is usually uniformly distributed throughout the year. Near the coast, however, it is slightly lower in summer. It 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)	123-152 days
Freeze-free period (characteristic range)	166-184 days
Precipitation total (characteristic range)	45-52 in
Frost-free period (actual range)	112-166 days
Freeze-free period (actual range)	142-203 days
Precipitation total (actual range)	40-53 in
Frost-free period (average)	139 days
Freeze-free period (average)	173 days
Precipitation total (average)	48 in

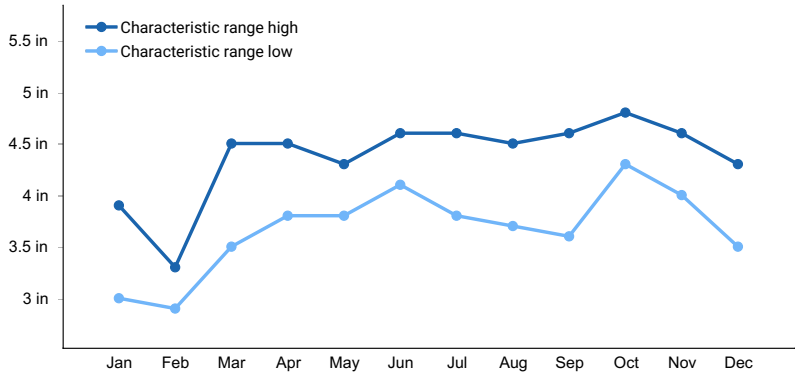


Figure 1. Monthly precipitation range

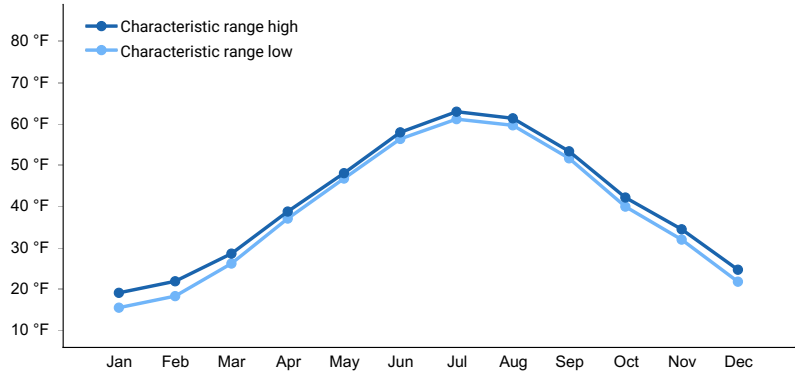


Figure 2. Monthly minimum temperature range

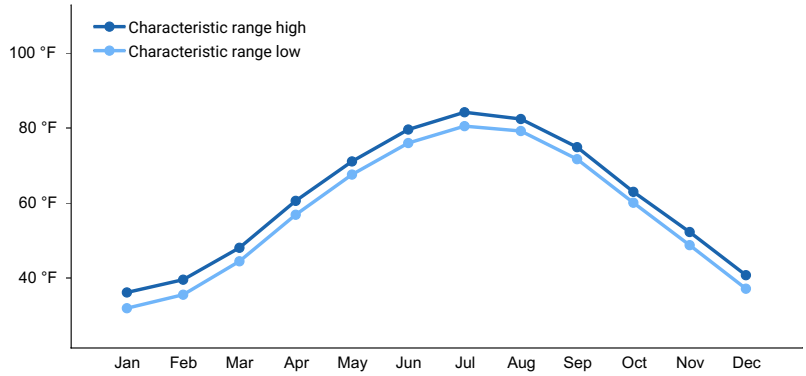


Figure 3. Monthly maximum temperature range

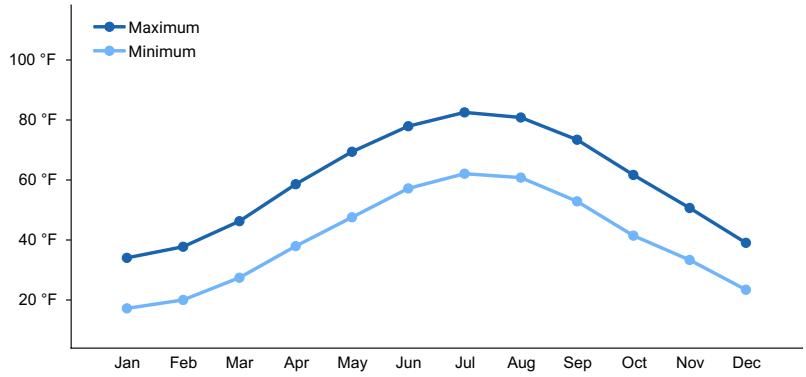


Figure 4. Monthly average minimum and maximum temperature

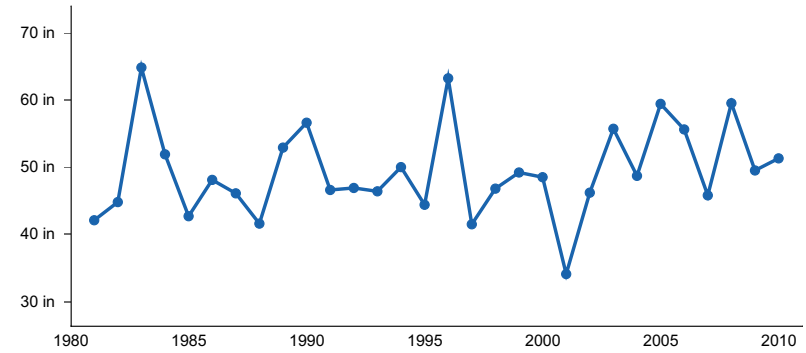


Figure 5. Annual precipitation pattern

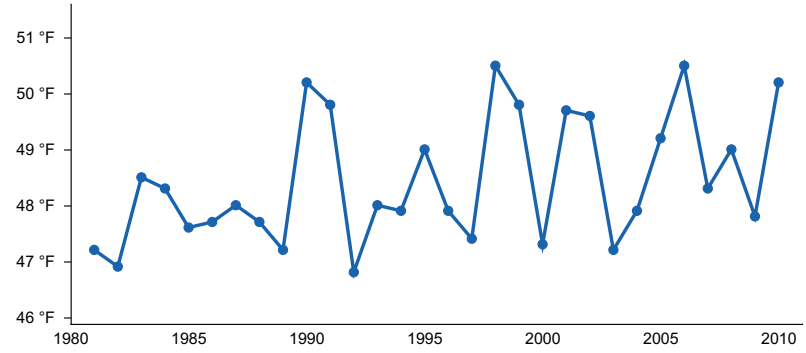


Figure 6. Annual average temperature pattern

Climate stations used

- (1) DANBURY [USC00061762], Bethel, CT
- (2) MASSABESIC LAKE [USC00275211], Manchester, NH
- (3) WOONSOCKET [USC00379423], Manville, RI

- (4) WORCESTER RGNL AP [USW00094746], Leicester, MA
- (5) WEST POINT [USC00309292], Cold Spring, NY
- (6) STORRS [USC00068138], Storrs Mansfield, CT
- (7) CHARLOTTEBURG RESERVE [USC00281582], Newfoundland, NJ
- (8) ALBANY AP [USW00014735], Latham, NY

Influencing water features

The site is flooded very rarely or for a shorter duration than low floodplains.

Wetland description

NONE

Soil features

The site consists of very deep, well drained coarse loamy soils formed in alluvial sediments. They are nearly level soils on flood plains, subject to common flooding. Slope ranges from 0 to 3 percent. Saturated hydraulic conductivity is moderately high or high in the loamy layers and high or very high in the sandy substratum. Soil pH ranges from very strongly acid to neutral.

Representative soils are Occum, and Wappinger.

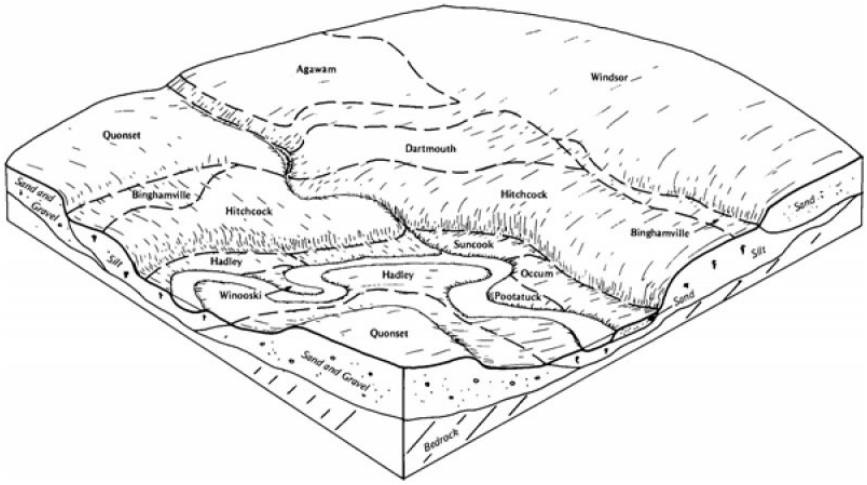


Figure 7. Sandy High Floodplain (Occum soils)

Table 4. Representative soil features

Parent material	(1) Alluvium–granite and gneiss (2) Schist (3) Shale (4) Slate (5) Sandstone and siltstone
Surface texture	(1) Very fine sandy loam (2) Fine sandy loam (3) Loam (4) Silt loam
Family particle size	(1) Coarse-loamy over sandy or sandy-skeletal (2) Coarse-loamy
Drainage class	Well drained
Permeability class	Very slow to moderate
Depth to restrictive layer	Not specified
Surface fragment cover <=3"	0%

Surface fragment cover >3"	0%
Available water capacity (0-40in)	4–6 in
Soil reaction (1:1 water) (0-40in)	3.6–8.4
Subsurface fragment volume <=3" (Depth not specified)	0–40%
Subsurface fragment volume >3" (Depth not specified)	0–6%

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. They are intended to provide a classification unit that is readily mappable, often from terrain and remote imagery, and readily identifiable by conservation and resource managers in the field. A 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, 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).

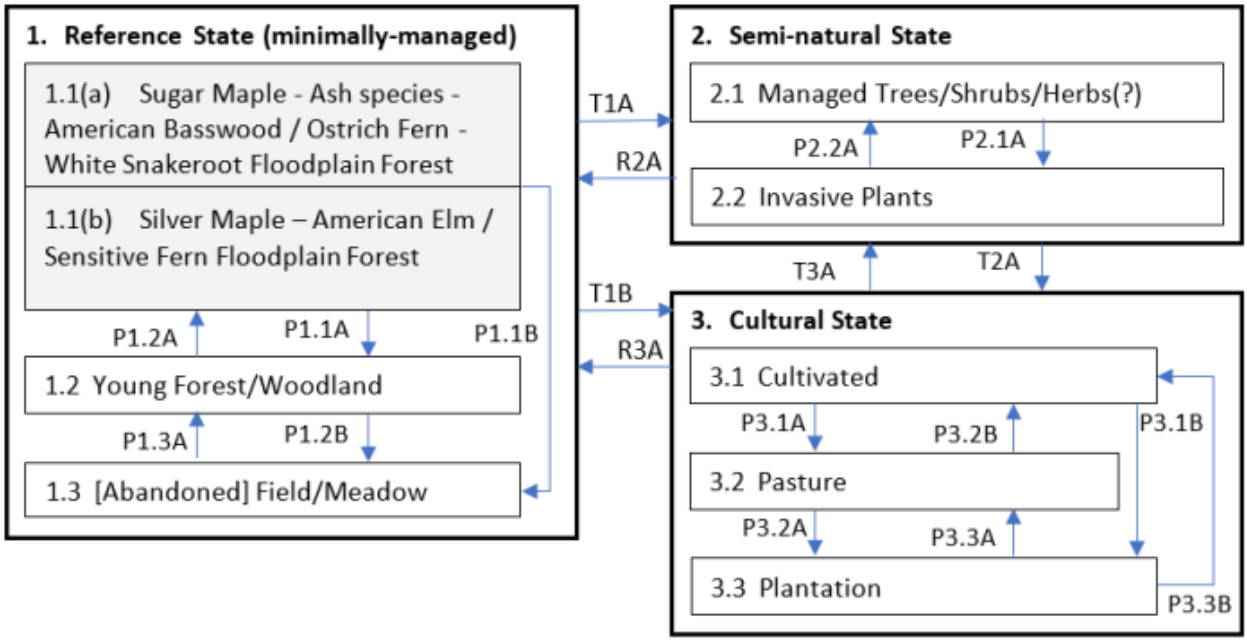
Additional and more localized vegetation information is provided by the State Natural Heritage Programs of Connecticut (Metzler and Barrett 2001) and Massachusetts (Swain and Kearsley 2001), New Hampshire (Sperduto and Nichols, 2011), and New York (Edinger et al., 2014).

The Laurentian-Acadian Floodplain Forest system (CES201.587) is characteristic of this ecological site (NatureServe 2015). This floodplain forest develops along medium to large river systems with a medium to low gradient. Disturbances are related to flood magnitude, frequency, and seasonal timing. At higher elevations in the floodplains and floodplain terraces, much of this ecological site has been converted to agriculture. The vegetation is often a mosaic of forest, woodland, shrub land, and herbaceous communities. However, with less the understory is more developed. The characteristic plant community is a Terrace Hardwood Floodplain Forest.

[*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

144AY010 – Sandy High Floodplain



Transition	*Drivers/practices*
T1A	Forest mgmt., Disturbance
T1B, T2A	Disturbance/cutting/clearing, Brush removal
R2A, R2B	Restoration & Mgmt, Forest Stand Improvement, Early Successional Habitat Development, Upland Wildlife Mgmt, 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 community occurs on active sandy high floodplain terraces. The predominant plant community is: Terrace Hardwood Floodplain Forest (CEGL006114), • *Acer saccharum* - Fraxinus spp. - *Tilia americana* / *Matteuccia struthiopteris* - *Ageratina altissima* Floodplain Forest ([translated] Sugar Maple - Ash species - American Basswood / Ostrich Fern - White Snakeroot Floodplain Forest) And may grade into: • Silver Maple Floodplain Levee Forest (CEGL006147) *Acer saccharinum* - (*Populus deltoides*) / *Matteuccia struthiopteris* - *Laportea canadensis* Floodplain Forest ([translated] Silver Maple - (Eastern Cottonwood) / Ostrich Fern - Canadian Woodnettle Floodplain Forest) On Medium to smaller river systems the predominant plant community is: • Northeastern Silver Maple - Elm Floodplain Forest (CEGL006001), *Acer saccharinum* - *Ulmus americana* / *Onoclea sensibilis* Floodplain Forest, ([Translated] Silver Maple - American Elm / Sensitive Fern Floodplain Forest)

Dominant plant species

- sugar maple (*Acer saccharum*), tree
- American basswood (*Tilia americana*), tree

- Sprengel's sedge (*Carex sprengelii*), grass

Community 1.1
(a) Sugar Maple - Ash species - American Basswood / Ostrich Fern - White Snakeroot Floodplain Forest (CEGL006114) (b) Silver Maple - American Elm / Onoclea sensibilis Floodplain Forest (CEGL006001)

1.1(a). Terrace Hardwood Floodplain Forest (CEGL006114), *Acer saccharum* - Fraxinus spp. - *Tilia americana* / *Matteuccia struthiopteris* - *Ageratina altissima* Floodplain Forest [translated - Sugar Maple - Ash species - American Basswood / Ostrich Fern - White Snakeroot Floodplain Forest] These floodplain forests occur on slightly elevated alluvial terraces and active floodplains of large to medium sized rivers. The alluvial soils are sandy and less regularly inundated than the soils supporting silver maple floodplain forests. Unlike lower elevation floodplain forests, the high-upper floodplain forests exhibits some canopy openness to allow a subcanopy of occasional shrubs. The herb layer is well-developed and seasonally variable, with spring ephemerals giving way to taller ferns, graminoids and forbs. Bryoids are very minor. The canopy dominants are variable, a combination of sugar maple (*Acer saccharum*), American basswood (*Tilia americana*), red oak (*Quercus rubra*), American elm (*Ulmus americana*), white ash (*Fraxinus americana*), and green ash (*Fraxinus pennsylvanica*). Minor canopy associates include bitternut hickory (*Carya cordiformis*, silver maple (*Acer saccharinum*), and red maple (*Acer rubrum*). Shrubs may include American bladdernut (*Staphylea trifolia*), nannyberry (*Viburnum lentago*), northern arrowwood (*Viburnum dentatum* var. lucidum) and choke cherry (*Prunus virginiana*). Vines present may include poison ivy (*Toxicodendron radicans*), Virginia creeper (*Parthenocissus quinquefolia*), or grapes (Vitis spp.). The herb layer features ostrich fern (*Matteuccia struthiopteris*) and an admixture of white snakeroot (*Ageratina altissima*), ramps (*Allium tricoccum*), meadow garlic (*Allium canadense*), lady fern (*Athyrium filix-femina*), blue cohosh (*Caulophyllum thalictroides*), graceful sedge (*Carex gracillima*), greater bladder sedge (*Carex intumescens*), Sprengel's sedge (*Carex sprengelii*), silvery false spleenwort (*Deparia acrostichoides*), Virginia wildrye (*Elymus virginicus*), riverbank wildrye (*Elymus riparius*), Wiegand's wildrye (*Elymus wiegandii*), sensitive fern (*Onoclea sensibilis*), bloodroot (*Sanguinaria canadensis*), zig-zag goldenrod (*Solidago flexicaulis*), wrinkledleaf goldenrod (*Solidago rugosa*), and smooth goldenrod (*Solidago gigantea*), as well as spring ephemerals in the early growing season. Exotic species, such as creeping jenny (*Lysimachia nummularia*), ground ivy (*Glechoma hederacea*), and dame's rocket (*Hesperis matronalis*), may occur in disturbed areas . (Source: NatureServe 2018 [accessed 2019], USNVC 2017 [accessed 2019]). Cross-referenced plant community concepts (typically by political state): CT: Sugar maple - White ash / Sprengel's sedge Floodplain Forest (Metzler and Barrett, 2006) MA: High-Terrace Floodplain Forest (Swain and Kearsley, 2001) NH: Sugar Maple - Silver Maple - White Ash Floodplain Forest (Sperduto and Nichols, 2011) NY: Floodplain Forest (Edinger et al., 2014) 1.1(b). Northeastern Silver Maple - Elm Floodplain Forest (CEGL006001), *Acer saccharinum* - *Ulmus americana* / *Onoclea sensibilis* Floodplain Forest, ([Translated] Silver Maple - American Elm / Sensitive Fern Floodplain Forest This floodplain forest occurs on higher terraces along the lower reaches of larger and medium sized rivers where flood depth and duration are relatively less than immediately adjacent to the river channel. The canopy is strongly dominated by silver maple (*Acer saccharinum*), slippery elm (*Ulmus rubra*), American elm (*Ulmus americana*), black cherry (*Prunus serotina*), and green ash (*Fraxinus pennsylvanica*) can occur in the subcanopy. Eastern cottonwood (*Populus deltoides*) occurs sporadically. Shrubs occur, unlike adjacent areas at lower elevations, including northern arrowwood (*Viburnum dentatum* var. lucidum), northern spicebush (*Lindera benzoin*), and silky dogwood (*Cornus amomum*). The herb layer is strongly dominated by sensitive fern (*Onoclea sensibilis*). Other hers include sweet woodreed (*Cinna arundinacea*), white avens (*Geum canadense*), white turtlehead (*Chelone glabra*), jewelweed (*Impatiens capensis*), fringed sedge (*Carex crinita*), hop sedge (*Carex lupulina*), and Gray's sedge (*Carex grayi*). (Source: NatureServe 2018 [accessed 2019], USNVC 2017 [accessed 2019]). Cross-referenced plant community concepts (typically by political state): CT: Sugar maple – Sensitive Fern Floodplain Forest (Metzler and Barrett, 2006) MA: Transitional Floodplain Forest (Swain and Kearsley, 2001) NH: Silver maple - false nettle - sensitive fern Floodplain Forest (Sperduto and Nichols, 2011) NY: Floodplain Forest (Edinger et al., 2014)

Community 1.2
Young Forest/Woodland

Community 1.3
[Abandoned] Field/Meadow

Pathway P1.1A
Community 1.1 to 1.2

Disturbance

Pathway P1.1B
Community 1.1 to 1.3

Disturbance

Pathway P1.2A
Community 1.2 to 1.1

Abandonment, Sucession

Pathway P1.2B
Community 1.2 to 1.3

Disturbance

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

Exotic species, such as creeping jenny (*Lysimachia nummularia*), ground ivy (*Glechoma hederacea*), and dame's rocket (*Hesperis matronalis*), may occur in disturbed areas .

Pathway P2.1A
Community 2.1 to 2.2

Disturbance, Invasive species establishment

Pathway P2.2A
Community 2.2 to 2.1

Invasive spp. Control, Forest mgmt.

State 3
Cultural State

Different phase of intense land use - may be cultivated crops, pasture/hay, or plantations (including nursery crops)

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

altered by Disturbance or Management

Conservation practices

Tree/Shrub Establishment
Forest Stand Improvement
Forest Land Management

Transition T1B
State 1 to 3

Disturbance, clearing, cutting

Conservation practices

Brush Management
Land Clearing
Herbaceous Weed Control

Restoration pathway R2A
State 2 to 1

Plant removals, plantings, Invasive plant control, successional mgmt., forestry practices Restoration & Mgmt, Forest Stand Improvement, Early Successional Habitat Development, Upland Wildlife Mgmt, Invasive spp. Control, Plant establishment

Conservation practices

Early Successional Habitat Development/Management
Restoration and Management of Natural Ecosystems
Native Plant Community Restoration and Management
Forest Land Management
Invasive Plant Species Control

Transition T2A
State 2 to 3

Disturbance, clearing, cutting

Conservation practices

Brush Management
Land Clearing
Herbaceous Weed Control

Restoration pathway R3A
State 3 to 1

Plant removals, plantings, Invasive plant control, successional mgmt., forestry practices Restoration & Mgmt, Forest Stand Improvement, Early Successional Habitat Development, Upland Wildlife Mgmt, Invasive spp. Control, Plant establishment

Conservation practices

Early Successional Habitat Development/Management
Restoration and Management of Natural Ecosystems
Native Plant Community Restoration and Management
Forest Land Management
Invasive Plant Species Control

Transition T3A
State 3 to 2

Abandonment, Plant establishment, Forest mgmt.

Conservation practices

Tree/Shrub Establishment
Forest Stand Improvement
Forest Land 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.

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Contributors

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Approval

Greg Schmidt, 10/04/2024

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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)	
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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:**

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3. **Number and height of erosional pedestals or terracettes:**

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4. **Bare ground from Ecological Site Description or other studies (rock, litter, lichen, moss, plant canopy are not bare ground):**

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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):**

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:**