USDA Natural Resources Conservation Service

# Ecological site F144AY042NY
# Semi-Rich Organic Wetlands

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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): 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 Semi Rich Organic Wetlands ecological site consists of very deep, very poorly drained organic soils formed in more than 16 inches of highly decomposed organic material on a variety of landforms. Soils are euic. Characteristic soils are Natchaug, Catden, Pinnebog, Timakwa, Wawayanda, Olentangy, and Palms. The site occurs within a variety of landforms, basins, depressions, swamps, seepage wetlands, and fens, occurring on organic soils of sub-acidic and higher pH values equal to or greater than 4.5 (i.e., euic). These various hydro-geologic settings are the primary determinant of water regimes, water chemistry, plant community structure and floristics, and groundwater recharge and discharge relationships (Golet et al 1992). Consequently, the reference plant community of the site is extremely variable ranging from hardwood, mixed, and conifer swamps to more open shubby wetlands and herbaceous wetlands and fens ranging in character with the prevailing pH.

## Similar sites

| | |
|---|---|
| F144AY014CT | **Wet Sandy Low Floodplain** |
| F144AY039NY | **Semi-Rich Wet Till Depressions** |

**Table 1. Dominant plant species**

| | |
|---|---|
| Tree | (1) *Acer rubrum* |
| Shrub | (1) *Vaccinium corymbosum* |
| Herbaceous | (1) *Sphagnum* |

## Physiographic features

The site occurs within nearly level depressions and frequently flooded/ponded terrain, with the water table at or near the ground surface.

**Table 2. Representative physiographic features**

| | |
|---|---|
| Landforms | (1) Depression<br>(2) Bog<br>(3) Marsh<br>(4) Swamp |
| Runoff class | Negligible to very low |
| Flooding frequency | None to frequent |
| Ponding frequency | None to frequent |
| Elevation | 0–2,401 ft |
| Slope | 0–2% |
| Water table depth | 0–12 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) | 120-135 days |
| Freeze-free period (characteristic range) | 149-168 days |
| Precipitation total (characteristic range) | 45-51 in |
| Frost-free period (actual range) | 113-163 days |
| Freeze-free period (actual range) | 142-200 days |
| Precipitation total (actual range) | 42-52 in |
| Frost-free period (average) | 132 days |
| Freeze-free period (average) | 163 days |
| Precipitation total (average) | 47 in |

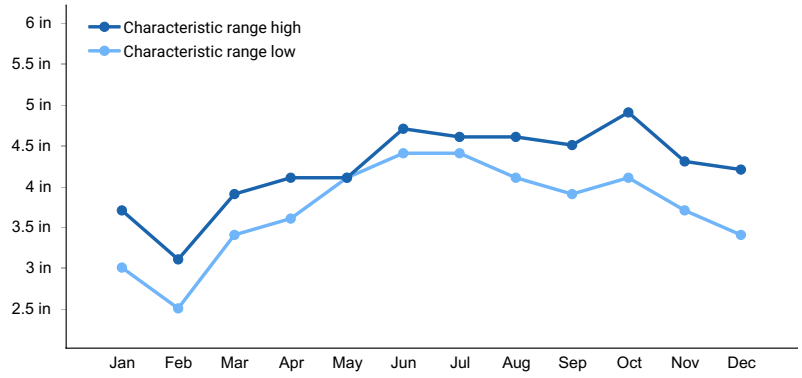



**Figure 1. Monthly precipitation range**

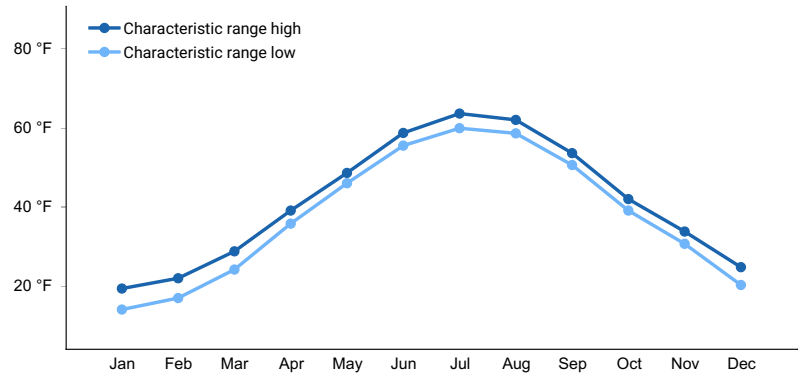



**Figure 2. Monthly minimum temperature range**

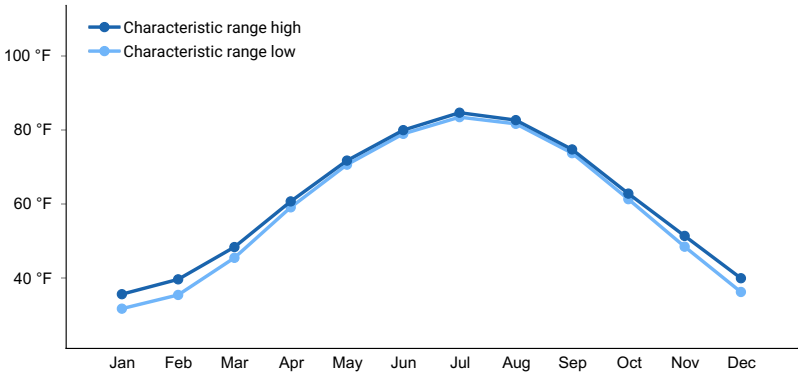



**Figure 3. Monthly maximum temperature range**

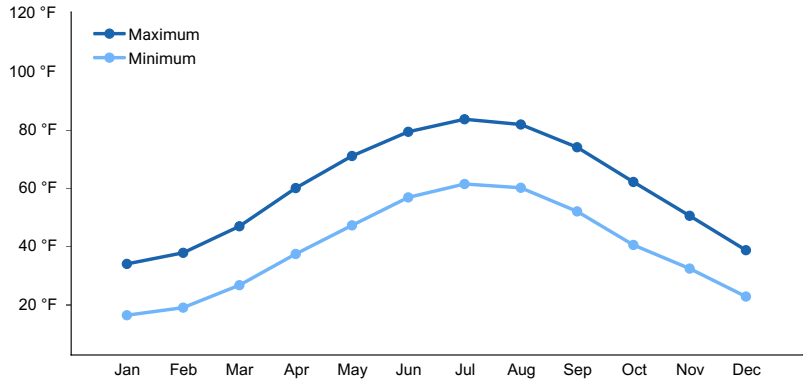



**Figure 4. Monthly average minimum and maximum temperature**

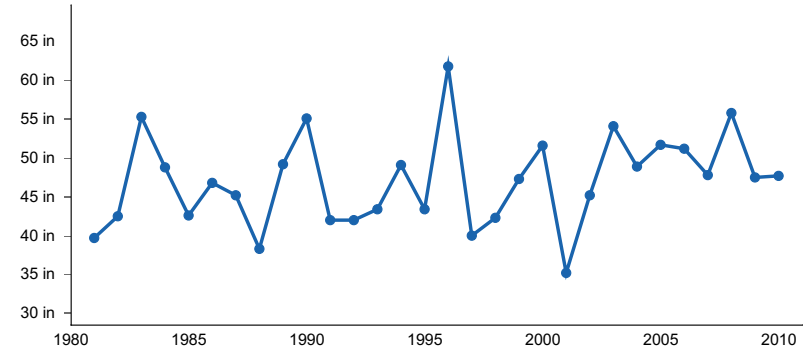



**Figure 5. Annual precipitation pattern**

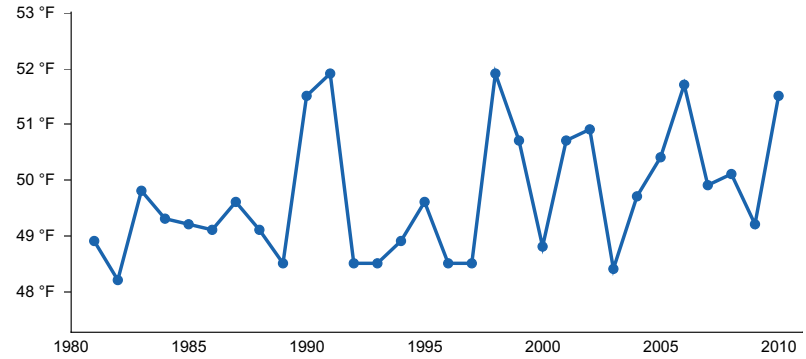



**Figure 6. Annual average temperature pattern**

## Climate stations used

- (1) FALLS VILLAGE [USC00062658], Falls Village, CT
- (2) NEWTON [USC00286177], Newton, NJ
- (3) WEST POINT [USC00309292], Cold Spring, NY
- (4) DANBURY [USC00061762], Bethel, CT
- (5) SARATOGA SPRINGS 4 SW [USC00307484], Saratoga Springs, NY
- (6) VALATIE 1 N [USC00308746], Valatie, NY

## Influencing water features

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

The site consists of very deep, very poorly drained soils formed primarily in highly decomposed woody and herbaceous organic materials. Representative soils are Natchaug, Catden, Pinnebog, Timakwa, Wawayanda, Olentangy, and Palms.

**Table 4. Representative soil features**

| | |
|---|---|
| Parent material | (1) Organic material<br>(2) Herbaceous organic material |
| Surface texture | (1) Muck<br>(2) Mucky |
| Drainage class | Very poorly drained |
| Permeability class | Very slow to slow |
| Depth to restrictive layer | 72 in |
| Surface fragment cover <=3" | 0% |
| Surface fragment cover >3" | 0% |
| Available water capacity (Depth not specified) | 10–18 in |
| Soil reaction (1:1 water) (Depth not specified) | 3.5–8.4 |
| Subsurface fragment volume <=3" (Depth not specified) | 0–35% |
| Subsurface fragment volume >3" (Depth not specified) | 0% |

## 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).

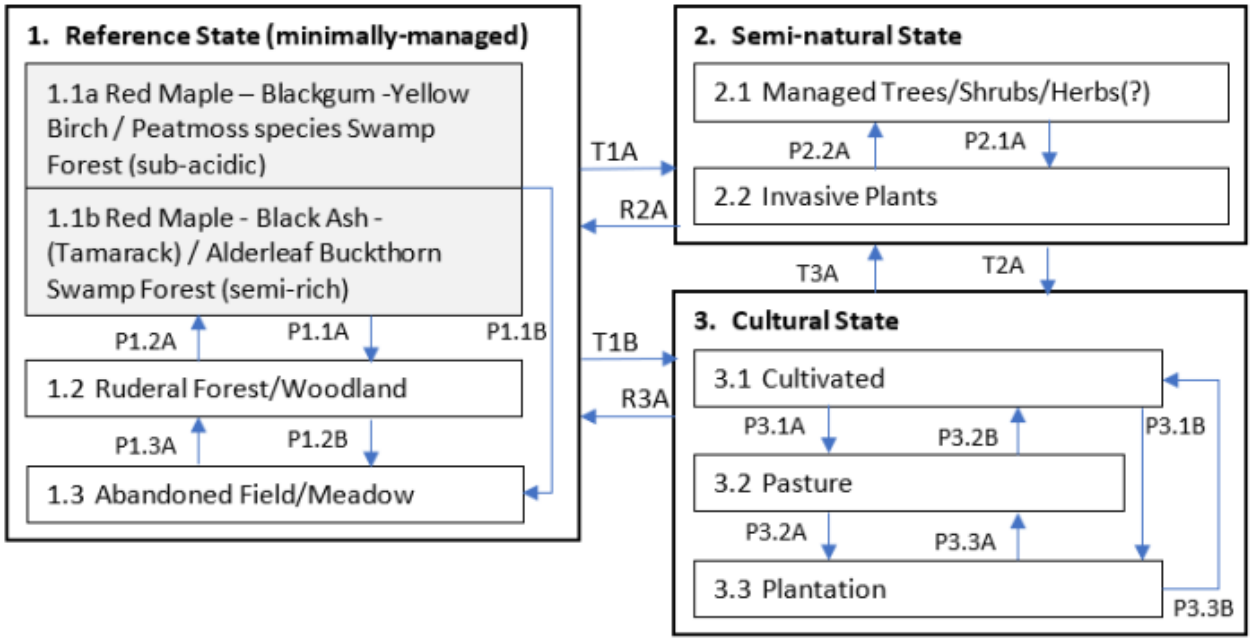
Ecological dynamics
The Semi Rich Organic Wetlands are characterized by a wide-range in pH settings ranging from sub-acidic to higher pH values equal to or greater than 4.5 pH (euic). Under lessor sub-acidic pH values, Semi-rich Organic

Wetlands overlap with vegetation of the Acid Organic Wetlands, characterized by North-Central Appalachian Swamp system (CES202.604), North-Central Appalachian and Acadian Conifer-Hardwood Acidic Swamp system (CES201.547), and the Northern Atlantic Coastal Plain Basin Peat Swamp system (CES203.522), Laurentian-Acadian Wet Meadow Shrub Swamp system (CES201.582). Under higher pH values, Semi-Rich Organic Wetlands are characterized by the vegetation of richer systems such as, North-Central Interior and Appalachian Rich Swamp system (CES202.605), North-Central Appalachian Seepage Fen (CES202.607), Laurentian-Acadian Alkaline Conifer-Hardwood Swamp (CES201.575), North-Central and Northeastern Seep (CES202.456), Northern Atlantic Coastal Plain Basin Peat Swamp system (CES203.522), Northern Atlantic Coastal Plain Basin Swamp and Wet Hardwood Forest system (CES203.520). The Semi-Rich Organic Wetlands occurs within basins, depressions, swamps, seepage wetlands, and fens occurring within sub-acidic to minerally enriched, higher-pH soils. These various hydro-geologic settings are the primary determinant of water regimes, water chemistry, plant community structure and floristics, and groundwater recharge and discharge relationships (Golet et al 1992). Consequently, the reference plant community of the site is extremely variable in floristic composition and appearance of hardwood, mixed, and conifer swamps to more open shrubby wetlands and herbaceous wetlands and fens. Natural disturbances include storm extremes ranging from windthrows to downbursts to ice-storms as well as pests and disease. Other agents-of-change include direct land conversions and fragmentation by agricultural, development, drainage, and logging. Indirect effects include changes to hydrology and water chemistry by development activities in the watershed. A wide variety of non-native invasive plant species may also disrupt these plant communities.

[*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

## 144AY042 – Semi Rich Organic Wetlands




| *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 plant community is highly variable depending on the prevailing pH values ranging from sub-acidic to semi-rich alkaline. The reference plant communities under sub-acidic conditions over lap with the Acidic Organic Wetlands ecological site, including: • *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) • *Acer rubrum* / *Ilex mucronata* - *Vaccinium corymbosum* Swamp Forest Translated Name: Red Maple / Catberry - Highbush Blueberry Swamp Forest Common Name: Northeast Red Maple Acidic Swamp Forest (CEGL006220) • *Tsuga canadensis* - *Betula alleghaniensis* / *Ilex verticillata* / Sphagnum spp. Swamp Forest Translated Name: Eastern Hemlock - Yellow Birch / Common Winterberry / Peatmoss species Swamp Forest Common Name: Hemlock - Hardwood Swamp Forest (CEGL006226) • Typha (angustifolia, latifolia) - (Schoenoplectus spp.) Eastern Marsh Translated Name: Narrowleaf Cattail, Broadleaf Cattail - Bulrush Eastern Marsh Common Name: Eastern Cattail Marsh (CEGL006153) • Other possible sub-acidic plant communities include: • *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) Other possible sub-acidic plant communities include: • *Scirpus cyperinus* Wet

Meadow Translated Name: Woolgrass Wet Meadow Common Name: Northeastern Woolgrass Wet Meadow (CEGL006349) • *Dulichium arundinaceum* / Sphagnum spp. Fen Translated Name: Threeway Sedge / Peatmoss species Fen Common Name: Southern New England Threeway Sedge Fen (CEGL006131) • *Sphagnum rubellum* - *Vaccinium oxycoccos* Fen Translated Name: Red Peatmoss - Small Cranberry Fen Common Name: Oligotrophic Peatland Moss Lawn (CEGL006135) • *Pontederia cordata* - *Peltandra virginica* - *Sagittaria latifolia* Marsh Translated Name: Pickerelweed - Green Arrow-arum - Broadleaf Arrowhead Marsh Common Name: Northeastern Leafy Forb Marsh (CEGL006191) The reference plant community in slightly higher pH settings includes: • *Acer rubrum* - *Fraxinus nigra* - (*Larix laricina*) / *Rhamnus alnifolia* Swamp Forest Translated Name: Red Maple - Black Ash - (Tamarack) / Alderleaf Buckthorn Swamp Forest Common Name: Red Maple - Black Ash Rich Seepage Swamp Forest (CEGL006009) • *Cornus racemosa* / Carex (sterilis, aquatilis, lacustris) Fen Translated Name: Gray Dogwood / Dioecious Sedge, Water Sedge, Lake Sedge Fen Common Name: Calcareous Basin Fen (CEGL006123) Other plant comminuties include: • *Acer rubrum* / *Carex lacustris* Wet Woodland Translated Name: Red Maple / Lake Sedge Wet Woodland Common Name: Red Maple / Lake Sedge Wet Woodland (CEGL006105) • *Cornus amomum* - *Salix candida* / *Dasiphora fruticosa* / *Carex stricta* Fen Translated Name: Silky Dogwood - Sageleaf Willow / Shrubby-cinquefoil / Upright Sedge Fen Common Name: Calcareous Shrub Fen (CEGL006359) • *Betula pumila* - *Toxicodendron vernix* - *Dasiphora fruticosa* Fen Translated Name: Bog Birch - Poison-sumac - Shrubby-cinquefoil Fen Common Name: Rich Shrub Carr (CEGL006360) • *Dasiphora fruticosa* / Carex (sterilis, hystericina, flava) Fen Translated Name: Shrubby-cinquefoil / (Dioecious Sedge, Bottlebrush Sedge, Yellow Sedge) Fen Common Name: Lower New England Sloping Fen (CEGL006326)

## Community 1.1
## 1.1a Red Maple - Blackgum - Yellow Birch / Peatmoss Swamp Forest (CEGL006220) 1.1b Red Maple - Black Ash - (Tamarack) / Alderleaf Buckthorn Swamp Forest (CEGL006009)

Community 1.1a. *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*), threelef 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) Community 1.1b *Acer rubrum* - *Fraxinus nigra* - (*Larix laricina*) / *Rhamnus alnifolia* Swamp Forest Translated Name: Red Maple - Black Ash - (Tamarack) / Alderleaf Buckthorn Swamp Forest Common Name: Red Maple - Black Ash Rich Seepage Swamp Forest (CEGL006009) The canopy is dominated by red maple (*Acer rubrum*) and black ash (*Fraxinus nigra*) with the American larch (*Larix laricina*) occasionally prominent. Other canopy trees includes yellow birch (*Betula alleghaniensis*), eastern hemlock (*Tsuga canadensis*), white pine (*Pinus strobus*), American hornbeam (*Carpinus caroliniana* ssp. virginiana), and red spruce (*Picea rubens*), the latter especially in the north or at higher elevations. Shrub cover varies with canopy cover and can be quite dense; typical species include poisin ivy (*Toxicodendron vernix*), alder-leaved buckthorn (*Rhamnus alnifolia*), red-osier dogwood (*Cornus sericea*), willows (Salix spp)., common winterberry (Ilex verticillate), highbush blueberry (*Vaccinium corymbosum*), and occasionally shrubby cinquefoil (*Dasiphora fruticosa* ssp. floribunda) and bog birch (*Betula pumila*). The diverse herb layer is characterized by eastern swamp saxifrage (*Saxifraga pensylvanica*), yellow marsh marigold (*Caltha palustris*), bulbous bittercress (*Cardamine bulbosa*), water avens(*Geum rivale*),cinnamon fern (*Osmunda cinnamomea*), bristly-stalked sedge (*Carex leptalea*), interior sedge (*Carex interior*), tussock sedge (*Carex stricta*), lakeside sedge (*Carex lacustris*), yellow-green sedge (*Carex flava*), rough leaved goldenrod (*Solidago patula*), blueflag iris (*Iris versicolor*), hispid crowfoot (*Ranunculus hispidus* var.

caricetorum), pink bittercress (*Cardamine douglassii*), marsh fern (*Thelypteris palustris*), crested wood-fern (*Dryopteris cristata*), golden groundsel (*Packera aurea* )(= Senecio aureus), and skunk cabbage ( *Symplocarpus foetidus*); plus yellow lady's slipper ( *Cypripedium parviflorum* [= Cypripedium calceolus[). (Source: NatureServe 2018 [accessed 2019], USNVC 2017 [accessed 2019]). Cross-referenced plant community concepts (typically by political state): CT: Red maple – black ash / hispid crowfoot Swamp Forest (Metzler and Barret, 2006) MA: Red Maple - Black Ash - Tamarack Calcareous Seepage Swamp (Swain and Kearsley, 2001) NY: Red maple-tamarack peat swamp (Edinger et al., 2014)

### Community 1.2
### Ruderal Forest/Woodland

### Community 1.3
### Abandoned Field/Meadow

Disturbance

### 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

Succession

### 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

### 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

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

altered by human- induced Disturbance or Management

**Conservation practices**

| |
|---|
| Tree/Shrub Establishment |
| Forest Land Management |
| Forest stand improvement for habitat and soil quality |

### Transition T1B
### State 1 to 3

Disturbance, clearing, cutting

### 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**

| |
|---|
| Brush Management |
| Tree/Shrub Establishment |
| Early Successional Habitat Development/Management |
| Forest Stand Improvement |
| 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

Land 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**

| |
|---|
| Restoration and Management of Natural Ecosystems |
| Native Plant Community Restoration and Management |

### 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.

## Other references

REFERENCES

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## Approval

Greg Schmidt, 10/04/2024

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## Rangeland health reference sheet

Interpreting Indicators of Rangeland Health is a qualitative assessment protocol used to determine ecosystem condition based on benchmark characteristics described in the Reference Sheet. A suite of 17 (or more) indicators are typically considered in an assessment. The ecological site(s) representative of an assessment location must be known prior to applying the protocol and must be verified based on soils and climate. Current plant community cannot be used to identify the ecological site.

| | |
|---|---|
| Author(s)/participant(s) | |
| Contact for lead author | |
| Date | 05/10/2025 |
| 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:

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:**