Ecological site F145XY004CT
Wet Lake Plain

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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): 145X–Connecticut Valley

Major Land Resource Area (MLRA): 145 – Connecticut Valley (USDA-NRCS, 2006). The nearly level floor of the Connecticut Valley makes up most of the area. Nearly level to sloping lowlands are at the outer edges of the river valley. These lowlands are broken by isolated, north- to south-trending trap-rock ridges that are hilly and steep. Elevation ranges from sea level to 100 meters (330 feet) in the lowlands and from 50 to 100 meters (650 to 1,000 feet) on ridges. The geology of this rift valley is a late Triassic and early Jurassic sandstone, shale, and conglomerate sequence. Tilted basalt flows along rift zones form the trap rock ridges exhibiting the greatest landscape relief. Glaciation accounts for glacial lake deposits, outwash, and till. Following glacial retreat, wind-deposited loess caps some areas. Recent alluvium deposits form well-developed flood plain along the Connecticut River. These deposits created some of the most productive agricultural soils in New England. The dominant soils are entisols and inceptisols with a mesic temperature regime in combination with parent materials such as glacial lakebeds, glacial outwash, glacial till, and recent alluvium. From north-to-south within the Connecticut Valley, the climate transitions from humid-continental to humid temperate with pronounced seasons and frequent storms. The forests are predominately central hardwoods to the south and transition hardwoods to the north. Significant habitats include trap rock ridges, sandplains, and floodplains of the Connecticut River and major tributaries. Much of the area is currently in residential and urban development and agriculture. While much of the areas is also forested, habitat loss and fragmentation are widespread throughout the Connecticut Valley.

Classification relationships

USDA-NRCS (USDA, 2006): Land Resource Region (LRR): R – Northeastern Forage and Forest Region Major Land Resource Area (MLRA): 145 – Connecticut Valley USDA-FS (Cleland et al, 2007): Province: 221 – Eastern Broadleaf Forest Section: 221A – Lower New England Subsection: 221Af –Lower Connecticut River Valley Province: M211 – Adirondack New England Mixed Forest – Coniferous Forest – Alpine Meadow (in part) Section: M211B– New England Piedmont (in part) Subsection: 211Bb – Southern Piedmont (in part)

Ecological site concept

The Wet Lake Plain ecological site consists of very deep, poorly drained soils formed in clayey, silty and loamy over clayey sediments. They are nearly level to gently sloping soils in low-lying positions on glaciolacustrine terraces. Geographically, these areas were once occupied by former glacial Lake Hitchcock in MA and northcentral CT, as well other former glacial lakes within the CT valley. Representative soils are Binghamville, Scitico (inland) Shaker and Raynham (inland). The vegetation is often a mosaic of forest, woodland, shrub land, and herbaceous communities. The reference forest community is typified by a red maple – hardwoods swamp forest. These sites may be perched or show seepage and maybe considered minerotrophic (slightly enriched).

Associated sites

F145XY003CT	Very Wet Inland Lake Plain

Similar sites

F145XY001MA	Silty High Floodplain
F145XY002MA	Silty Low Floodplain

Table 1. Dominant plant species

Tree	(1) *Acer rubrum* (2) *Quercus palustris*
Shrub	(1) *Vaccinium corymbosum* (2) *Ilex verticillata*
Herbaceous	(1) *Thelypteris palustris* (2) *Scirpus cyperinus*

Physiographic features

The site occurs nearly level depressions, drainageways, and terraces. The water table is at or near the surface for most of the year, but the site is typically not subject to regular flooding/ponding.

Table 2. Representative physiographic features

Landforms	(1) Lake plain > Depression (2) Plains > Lake terrace (3) Valley > Drainageway (4) Terrace (5) Marine terrace
Runoff class	Negligible to very high
Flooding frequency	None
Ponding frequency	None
Elevation	0 – 460 m
Slope	0 – 10 %
Water table depth	10 – 40 cm

Aspect	Aspect is not a significant factor

Climatic features

The regional climate of the Connecticut Valley transitions north to south, from humid-continental to humid temperate, respectively, with pronounced seasons and frequent storms. (Beck et al., 2018; Bailey, 2014).

Climate change is occurring, and the resiliency of any ecological site will depend upon the direct and indirect effects upon component species and shifting atmospheric and soil conditions. On these ecological sites, wetland forests are at a moderate vulnerability risk to climate change with impacts considered both negative and positive. Warmer seasonal temperatures and a prolonged growing season will be beneficial for increasing wetland forest productivity. However, climate extremes may introduce earlier leaf phenologies susceptible to frost damage and general plant weakening. Although wetland forests are adapted to seasonal changes in hydrology, more intense and catastrophic storms (wind, rain, ice) may increase the frequency of canopy gaps, amplify the effects of insect pests, and introduced species. Several invasive species will continue to be a threat. (Janowiak et al, 2018).

Table 3 Representative climatic features

Frost-free period (characteristic range)	120-140 days
Freeze-free period (characteristic range)	150-190 days
Precipitation total (characteristic range)	1,040-1,190 mm
Frost-free period (actual range)	110-150 days
Freeze-free period (actual range)	150-190 days
Precipitation total (actual range)	1,020-1,300 mm
Frost-free period (average)	130 days
Freeze-free period (average)	170 days
Precipitation total (average)	1,140 mm

- (1) MT CARMEL [USC00065077], Hamden, CT
- (2) HARTFORD BRADLEY INTL AP [USW00014740], Suffield, CT
- (3) AMHERST [USC00190120], Amherst, MA
- (4) NEW HAVEN TWEED AP [USW00014758], East Haven, CT
- (5) BELLOWS FALLS [USC00430499], Bellows Falls, VT
- (6) HANOVER [USC00273850], Hanover, NH

Influencing water features

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 very deep, poorly drained soils formed in loamy over clayey or silty and clayey sediments. They are nearly level to gently sloping soils in low-lying positions on glaciolacustrine and marine terraces. Representative soils are Binghamville, Scitico (inland) Shaker and Raynham (inland).

Table 4. Representative soil features

Parent material	(1) Eolian deposits (2) Glaciolacustrine deposits (3) Lacustrine deposits
Surface texture	(1) Silt loam
Family particle size	(1) Coarse-loamy over clayey (2) Coarse-silty over clayey (3) Coarse-silty (4) Fine
Drainage class	Poorly drained
Permeability class	Very slow to slow
Depth to restrictive layer	60 – 180 cm
Surface fragment cover <=3"	Not specified
Surface fragment cover >3"	Not specified
Available water capacity (0-101.6cm)	12.7 – 22.86 cm
Calcium carbonate equivalent (0-101.6cm)	0 – 10 %

Electrical conductivity (0-101.6cm)	Not specified
Sodium adsorption ratio (0-101.6cm)	Not specified
Soil reaction (1:1 water) (0-101.6cm)	4.5 – 7.8
Subsurface fragment volume <=3" (Depth not specified)	Not specified
Subsurface fragment volume >3" (Depth not specified)	Not specified

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 can be provided by the various State Heritage Programs. Additional insights to the vegetation were provided by: "The Vegetation of Connecticut: A Preliminary Classification" (Metzler and Barrett, 2006), "Classification of the Natural Communities of Massachusetts" (Swain and Kersley 2011), "Wetland, Woodland, Wildland" (Thompson and Sorenson 2000), and "Natural Communities of New Hampshire, 2nd Ed." (Spurduto and Nichols, 2011).

The Wet Lake Plain ecological site is characteristic of the North-Central Appalachian Acidic Swamp system (CES202.604). The reference community is typified by a red maple -hardwoods swamp. Windthrows are common. Alteration of the natural hydrological regime (diversions, culverts, impoundments) can be a threat. Fires are typically suppressed, and otherwise less common in these wet lake plain environments compared to drier upland environments. Windthrows are common. Invasive species, such as common reedgrass (Phragmites australis ssp. australis), purple loosetrife (Lythrum salicaria), and occasionally multiflora rose (Rosa multiflora), non-native honeysuckles (Lonicera spp., Japanese stiltgrass (Microstegium vimineum), Japanese knotweed (Fallopia japonica), and barberry (Berberis thunbergii) may produce a state change. The most significant threat is the emerald ash borer (Agrilus planipennis), an Asian beetle that infests and kills North American ash trees.

Other ecological states, a Semi-natural State and a Cultural State are recognized. The Semi-natural State would expect plant communities where ecological processes primarily operate with some conditioning by land management, e.g., managed forests, or plant communities that are an artifact of land management e.g., predominately invasive plants. The Cultural State is a completely converted or transformed state heavily or completely conditioned by land management, e.g., cultivated lands, pasture/haylands, vineyards, and plantations, etc. Generally, the form of vegetation in the Semi-natural State or the Cultural State is not able to be specified until field work is conducted.

State and transition model

Additional community tables

Table 5. Community 1.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production ()	Foliar Cover (%)

Table 6. Community 2.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production ()	Foliar Cover (%)

Table 7. Community 2.2 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production ()	Foliar Cover (%)

Table 8. Community 3.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production ()	Foliar Cover (%)

Table 9. Community 3.2 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production ()	Foliar Cover (%)

Table 10. Community 3.3 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production ()	Foliar Cover (%)

Inventory data references

Site Development and Testing Plan 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

Nels Barrett, 9/27/2024

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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	09/07/2026

Approved by	
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:**
