Ecological site F145XY001MA
Silty High Floodplain

Last updated: 9/27/2024
Accessed: 09/05/2026

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. The Silty High Floodplain ecological site is found in the highest position with the least flooding in the elevational profile of active floodplains of variously sized rivers.

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 Silty High Floodplain ecological site consists of deep, coarse-silty, well drained, alluvial soils on high floodplains of mostly large rivers, but can occasionally develop along medium to small-sized rivers. The site is flooded less frequently or for a shorter duration than low floodplains. The representative soil is Hadley. Reference plant community includes: Sugar Maple - Ash species - American Basswood / Ostrich Fern - White Snakeroot Floodplain Forest, or, occasionally, Silver Maple – American Elm / Sensitive Fern Floodplain Forest. Limited examples of this forest type exist since they have mostly been converted to agricultural use.

Associated sites

F145XY008MA	**Dry Outwash**
F145XY002MA	**Silty Low Floodplain** Low Floodplain occurs on moderately well drained soils.

Similar sites

F145XY004CT	**Wet Lake Plain**
F145XY005MA	**Moist Lake Plain**

Table 1. Dominant plant species

Tree	(1) *Acer saccharum* (2) *Tilia americana*
Shrub	(1) *Viburnum lentago*
Herbaceous	(1) *Matteuccia struthiopteris* (2) *Ageratina altissima*

Physiographic features

The Silty High Floodplain ecological site occurs on nearly level floodplains along rivers, at higher elevational positions in the floodplain profile where flooding is rare to occasional. Flooding by stream overflow ranges from once a year to once in 5 to 10 or more years. Flooding generally occurs during the early spring runoff or occasionally during periods of high rainfall in the fall. Floodwater seldom covers these soils for periods of more than 2 or 3 days on the high bottoms, but the duration is up to 7 days in the lower positions. Slopes range from 0 to 3 percent and runoff potential is low.

Figure 1. High Floodplain - Hadley soils

Table 2. Representative physiographic features

Landforms	(1) River valley > Flood plain (2) Valley > Alluvial flat
Runoff class	Negligible to high
Flooding duration	Very brief (4 to 48 hours) to brief (2 to 7 days)
Flooding frequency	None to frequent
Ponding frequency	None
Elevation	0 – 610 m
Slope	0 – 70 %

Water table depth	100 – 180 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). Locally, the Silty High Floodplain ecological site is dependent upon extreme flood events coinciding with freshets in the early spring due to snowmelt and heavy precipitation events within the watershed at any time (Metzler and Damman 1985).

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, floodplain forests are at a moderate vulnerability risk to climate change with impacts considered both negative and positive. Although floodplain forests are adapted to annual and season flooding, more intense precipitation and extreme flooding due to greater storm frequency and magnitude, may pose risks associated with prolonged flooding, and streambank erosion, or provide benefits associate with greater deposition of sediments. Warmer seasonal temperatures as predicted are expected to diminish snowmelt and the benefits of sediment deposition during the spring freshets. Invasive species such as glossy buckthorn (Frangula alnus) and Japanese stiltgrass (Microstegium vimineum) continue to be a threat (Janowiak et al., 2018).

Table 3 Representative climatic features

Frost-free period (characteristic range)	130-140 days
Freeze-free period (characteristic range)	160-190 days
Precipitation total (characteristic range)	1,170-1,320 mm
Frost-free period (actual range)	110-150 days
Freeze-free period (actual range)	150-190 days
Precipitation total (actual range)	1,170-1,320 mm
Frost-free period (average)	140 days
Freeze-free period (average)	170 days
Precipitation total (average)	1,250 mm

- (1) HARTFORD BRADLEY INTL AP [USW00014740], Suffield, CT
- (2) MIDDLETOWN 4 W [USC00064767], Middlefield, CT
- (3) MT CARMEL [USC00065077], Hamden, CT
- (4) AMHERST [USC00190120], Amherst, MA

Influencing water features

The Silty High Floodplain ecological site is located along low-gradient river systems of varying size from large to small. River flooding is variable, ranging from rare to occasional, coinciding with seasonal flood events during the spring freshet to extreme precipitation events throughout the year.

Wetland description

National Wetland Classification System (Cowardin et al., 1979) considers the Silty High Floodplain ecological site in the Palustrine system, with a vegetated class, such as emergent, scrub-shrub, or forested, and modified by a non-tidal water regime ranging from temporarily flooded to seasonally flooded.

Soil features

The site consists of very deep, well drained soils that formed in silty alluvial sediments derived from mixed crystalline and sedimentary rocks.

Hadley soils mapped within MLRA 145 and surrounding MLRA 144A are associated with the Silty High Floodplain ecological site.

Table 4. Representative soil features

Parent material	(1) Alluvium – metamorphic rock (2) Granite and gneiss (3) Schist (4) Quartzite
Surface texture	(1) Fine sandy loam (2) Silt loam (3) Very fine sandy loam (4) Loamy fine sand (5) Loamy sand
Family particle size	(1) Coarse-loamy (2) Coarse-silty
Drainage class	Well drained to excessively drained
Permeability class	Slow to very rapid
Depth to restrictive layer	180 cm
Surface fragment cover <=3"	Not specified
Surface fragment cover >3"	Not specified

Available water capacity (Depth not specified)	2.54 – 20.32 cm
Soil reaction (1:1 water) (Depth not specified)	4.5 – 7.8
Subsurface fragment volume <=3" (Depth not specified)	0 – 40 %
Subsurface fragment volume >3" (Depth not specified)	0 – 40 %

Ecological dynamics

Caveat: The vegetation information contained in this section 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 et al., 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 (FDGC, 2008; USNVC, 2017). Each association will be named by the diagnostic and often dominant species that occupy the different height strata (represented by tree, shrub, and herb layers). 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 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 2020), "Wetland, Woodland, Wildland" (Thompson and Sorenson 2000), and "Natural Communities of New Hampshire, 2nd Ed." (Spurduto and Nichols, 2011).

Due to a long history of human activity, the reference condition more accurately reflects the current naturalized, minimally-managed state rather than the historic, pre-European settlement condition. Within the Reference State, plant communities characteristic to the High Silty Floodplain ecological site belong to the Central Appalachian River Floodplain Forest system (CES202.608) (NatureServe (2020). These floodplains are often broad and well-developed along medium to large rivers and occasionally small, low-gradient river systems. Differences in the flood regime, related to proximity to the river and flood elevations, in combination with the variability of the substrate will determine the mix of floodplain vegetation (Marks et al., 2014). Silty High Floodplain ecological sites are areas within the active floodplain profile at the highest elevation and subject to the least flooding. Much of these upper floodplains have been converted to agriculture. Only small remnants of Silty High Floodplain ecological sites exist. High fertility, fragmentation, and lack of natural buffers results in susceptibility to non-native plant invasions. Besides the mature plant community-types listed, other spontaneous, successional plant community-types may exist following natural disturbances.

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.

[*Caveat] The vegetation information presented is representative of complex plant 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

Additional community tables

Table 5. Community 1.1 plant community composition

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

Table 6. Community 1.2 plant community composition

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

Table 7. Community 1.3 plant community composition

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

Table 8. Community 1.4 plant community composition

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

Table 9. Community 2.1 plant community composition

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

Table 10. Community 2.2 plant community composition

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

Table 11. Community 3.1 plant community composition

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

Table 12. Community 3.2 plant community composition

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

Table 13. 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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Approval

Nels Barrett, 9/27/2024

Acknowledgments

Michael Margo and tech team assisted w/drafts.

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	09/05/2026
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:

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:**