

# Ecological site F145XY002MA

## Silty Low Floodplain

Accessed: 05/20/2024

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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

The nearly level floor of the Connecticut River 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 330 feet in the lowlands and from 650 to 1,000 feet on ridges.

Recent alluvium has been deposited on the nearly level flood plain along the Connecticut River since the glacial retreat about 10,000 to 12,000 years ago. These deposits created some of the most productive agricultural soils in New England. Glacial lake deposits, outwash, and recent alluvial deposits dominate.

The area primarily supports central hardwoods. Habitat loss and fragmentation are widespread throughout the lower part of the Connecticut River Valley. The major tree species in the rest of the forested areas are sugar maple, birch, beech, oaks, and hickory. White pine and hemlock are the dominant conifers, but pitch pine and red pine are more common on sandy soils. Red maple grows on the wetter sites.

The most common understory plants are moosewood and hobblebush in the northern part of the area and dogwood in the southern part. Abandoned agricultural land is dominated by white pine and paper birch in the northern part and red cedar and gray birch in the southern part. The important upland habitats include trap-rock ridges and sand plains. Oak woodlands and cedar glades are common on the ridges. Black oak savannas mixed with pitch pine and varying amounts of little bluestem are common on the sand plains. Other habitats of significance include wetlands associated with the Connecticut River freshwater marshes, swamps, flood plains, and lowlands. The dominant trees on the flood plains are black willow, cottonwood, and sycamore.

Large mammals, such as white-tailed deer, moose, and black bear, are in the forests in the northern part of this area. Animals that are tolerant of human settlement are numerous throughout the rest of the MLRA. Examples are white-tailed deer, opossum, skunk, raccoon, and coyote.

### Classification relationships

USDA NRCS:

LRR: Northeastern Forage and Forest Region

MLRA 145 Connecticut Valley

USDA USFS:

Province221: Eastern Broadleaf Forest

Section 221A: Lower New England

Subsection 221Af: Lower Connecticut River Valley

EPA Ecoregions:

Level III: 59 Northeast Coastal Zone

Level IV: 59a Connecticut Valley

## Ecological site concept

The site consists of deep, coarse-silty, moderately well drained, alluvial soils on low floodplains of mostly large river valleys but can occasionally be found within small river valleys. These floodplains are subject frequent to occasional flooding and for longer duration than high floodplains. Representative soil is Winooski.

The reference community is a deciduous forest dominated by silver maple with cottonwood occurring sporadically within the tree layers. American elm and green ash are found as low trees. Northern spicebush, southern arrowwood and silky dogwood are can be found in the shrub layer. Sensitive fern can dominate the forest floor. Additional species include sweet reedgrass, white avens, white turtlehead, jewelweed and various sedges (Metzler and Barrett 2006). Pin oak, green ash, and American sycamore will be more common within small to medium river valleys.

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).

The frequency, duration, and timing of floods is the primary natural disturbance affecting species composition.

Floodplain forests are commonly found in early to mid-successional stages because of the dynamic nature of floodplains (Thompson and Sorenson 2000). Young alluvial forests are typically dominated by eastern cottonwood along major rivers or American sycamore in small to medium sized rivers.

Invasive exotic plants are a significant threat to the community since many can successfully displace native species.

Common invasive exotic plants are Japanese barberry, Norway maple, Oriental bittersweet, European bush honeysuckle, garlic mustard, and Japanese stiltgrass.

Table 1. Dominant plant species

Tree	(1) <i>Acer saccharinum</i>
Shrub	Not specified
Herbaceous	(1) <i>Onoclea sensibilis</i>

## Physiographic features

The site occurs are on nearly level flood plains of large and small river valleys. Slopes range from 0 through 3 percent. Flooding is occasional to frequent and duration brief. Runoff potential ranges from very low to low.

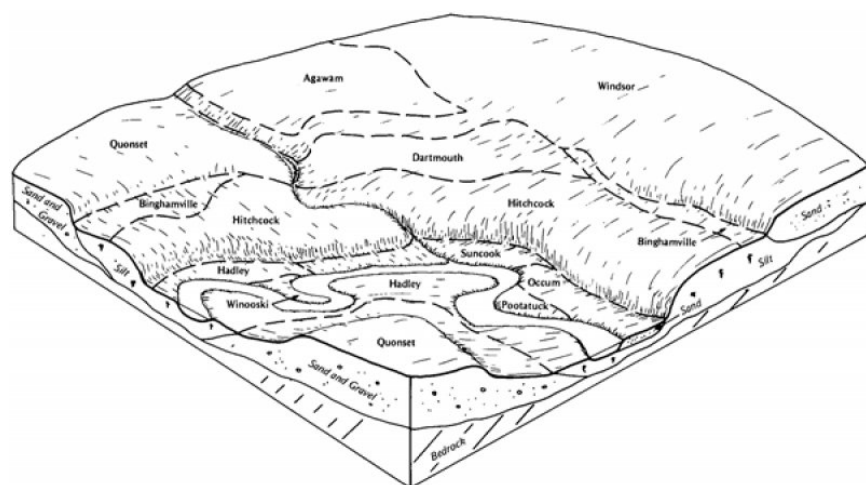


Figure 1. Low Floodplain - Winooski soils

Table 2. Representative physiographic features

Landforms	(1) Flood plain
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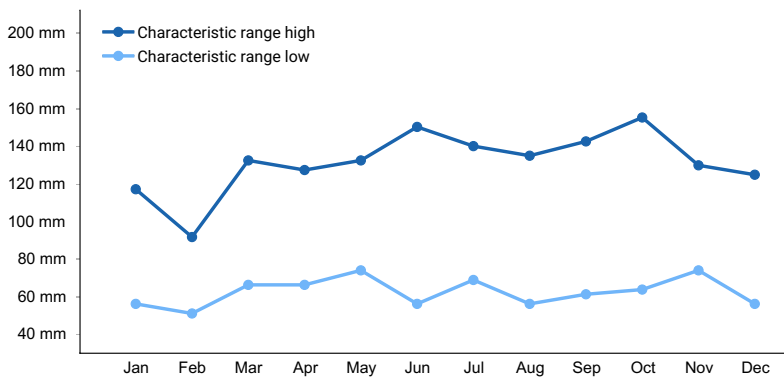
Flooding duration	Brief (2 to 7 days)
Flooding frequency	Occasional to frequent
Ponding frequency	None
Elevation	6–183 m
Slope	0–3%
Water table depth	183 cm
Aspect	Aspect is not a significant factor

## Climatic features

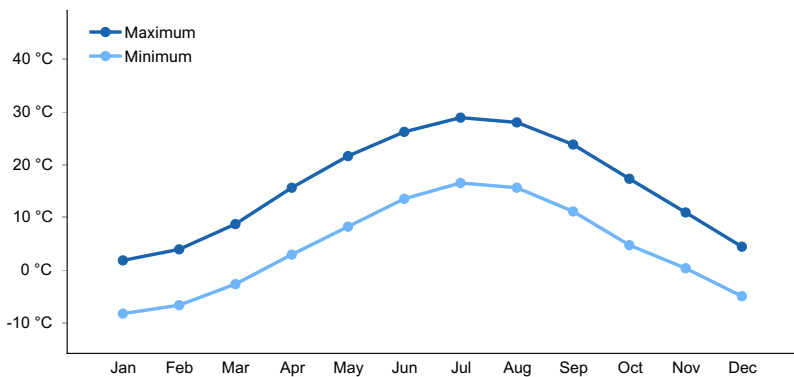
Humid continental climate which is typified by large seasonal temperature differences with warm to hot (often humid) summers and cold winters. Average annual precipitation is 50 inches with an average 141 frost free days and 166 freeze free days.

**Table 3. Representative climatic features**

Frost-free period (average)	141 days
Freeze-free period (average)	166 days
Precipitation total (average)	1,270 mm



**Figure 2. Monthly precipitation range**



**Figure 3. Monthly average minimum and maximum temperature**

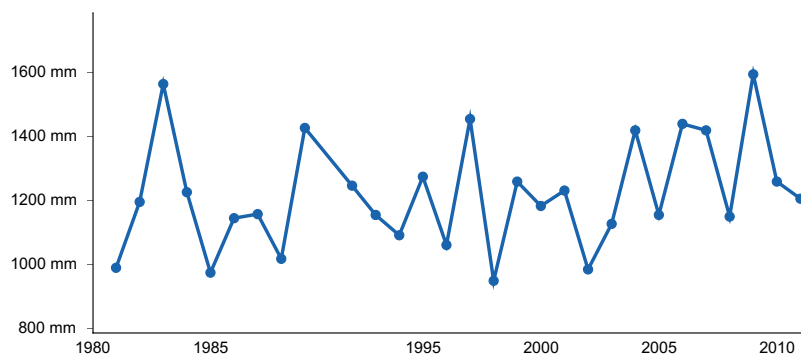


Figure 4. Annual precipitation pattern

### Climate stations used

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

### Influencing water features

#### Soil features

The site consists of very deep, moderately well drained silty soils formed in recent alluvial deposits derived from mixed crystalline and sedimentary rocks. Gravel ranges from 0 through 5 percent by volume throughout the soil. Reaction ranges from strongly acid through neutral.

Winooski soils mapped within MLRA 145 and surrounding MLRA 144A are representative of the Low Floodplain provisional ecological site. Winooski soils are also mapped within the Champlain Valley (MLRA 142), however, further investigation is needed to determine if the concept of this site extends that far north.

Table 4. Representative soil features

Parent material	(1) Alluvium–arkose
Surface texture	(1) Very fine sandy loam (2) Sandy loam (3) Loamy very fine sand
Drainage class	Moderately well drained
Permeability class	Moderate to moderately rapid
Soil depth	183 cm
Surface fragment cover <=3"	0–1%
Surface fragment cover >3"	0%
Available water capacity (0-101.6cm)	17.78 cm
Calcium carbonate equivalent (0-101.6cm)	0%
Electrical conductivity (0-101.6cm)	0 mmhos/cm
Sodium adsorption ratio (0-101.6cm)	0
Soil reaction (1:1 water) (0-101.6cm)	4.5–6.2
Subsurface fragment volume <=3" (Depth not specified)	0–5%

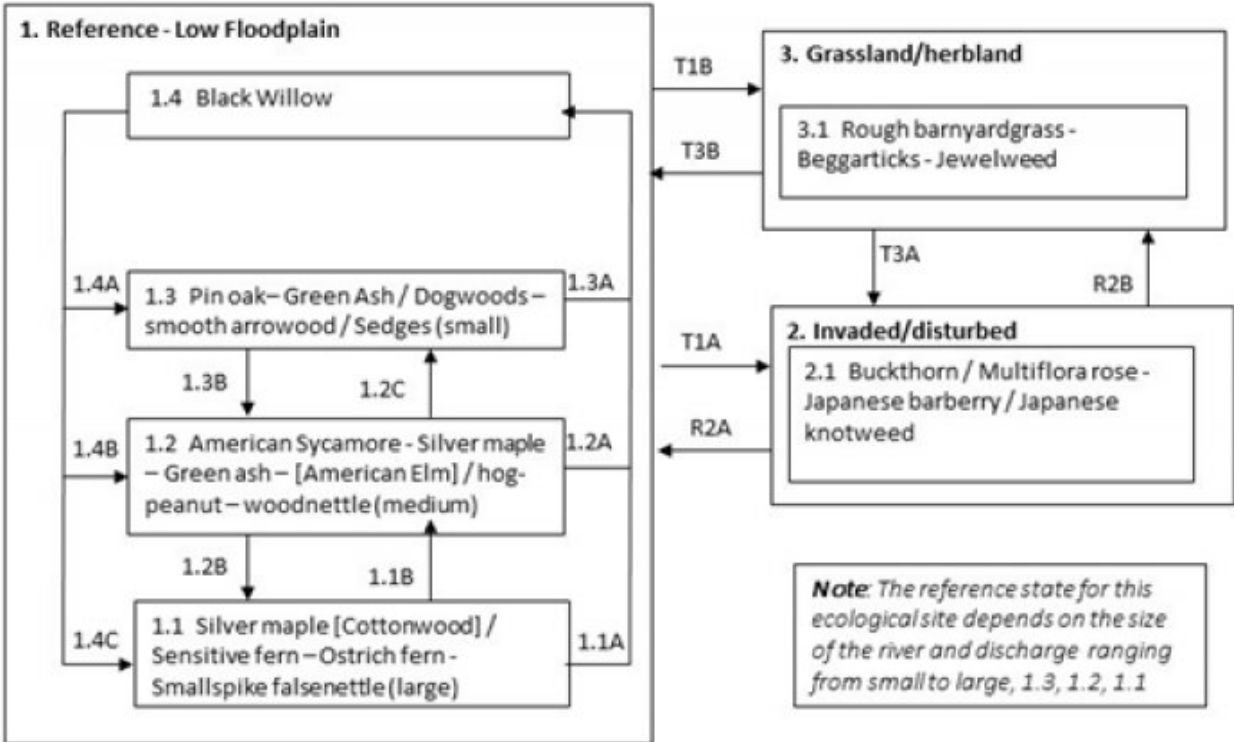
Subsurface fragment volume >3" (Depth not specified)	0%
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### Ecological dynamics

The reference community is a deciduous forest dominated by silver maple with cottonwood occurring sporadically within the tree layers. American elm and green ash are found as low trees. Northern spicebush, southern arrowwood and silky dogwood are can be found in the shrub layer. Sensitive fern can dominate the forest floor. Additional species include sweet reedgrass, white avens, white turtlehead, jewelweed and various sedges (Metzler and Barrett 2006). Pin oak, green ash, and American sycamore will be more common within small to medium river valleys. 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). The frequency, duration, and timing of floods is the primary natural disturbance affecting species composition. Floodplain forests are commonly found in early to mid-successional stages because of the dynamic nature of floodplains (Thompson and Sorenson 2000). Young alluvial forests are typically dominated by eastern cottonwood along major rivers or American sycamore in small to medium sized rivers. Invasive exotic plants are a significant threat to the community since many can successfully displace native species. Common invasive exotic plants are Japanese barberry, Norway maple, Oriental bittersweet, European bush honeysuckle, garlic mustard, and Japanese stiltgrass.

### State and transition model

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Code	Agent/Event/Activity/Process
1.1B,, 1.2B, 1.2C, 1.3B	Differences in flood regime; variable
1.1A, 1.2A, 1.3A	Extreme flood disturbance
1.4A, 1.4B, 1.4C, T3B	Succession
T1A, T3A	Invaded species dominate
R2A, R2B	Invasive species removal
T1B	Clearcutting

Figure 6. F145XY002MA Low Floodplain

## State 1 Reference

Silver maple and/or Cottonwood dominated floodplain forest. Subdominant trees include green ash, American sycamore, American elm, black willow, and pin oak. Other common plants include smallspike false-nettle, woodnettle, hog peanut, smooth arrowwood, dogwoods, and sedges. Natural floods is the most influential disturbance affecting species composition within the reference state.

## State 2 Invaded

Introduction of invasive non-native plants characterizes this state. Common invasive plants include Chinese buckthorn, multiflora rose, Japanese barberry, and Japanese knotweed.

## State 3 Grassland

Grass and forb dominated state resulting from clear-cutting.

## Other references

Marks, C.O., K.A. Lutz, A.P. Olivero-Sheldon. 2011. Ecologically important floodplain forests in the Connecticut River watershed. The Nature Conservancy, Connecticut River Program. 44pp.

Metzler, K.J. and Barrett, J.P., 2006. The Vegetation of Connecticut, a Preliminary Classification. Department of Environmental Protection, State Geological and Natural History Survey of Connecticut.

Swain, P.C. and J.B. Kearsley. 2011. Classification of the Natural Communities of Massachusetts. Version 1.4. Natural Heritage & Endangered Species Program, Massachusetts Division of Fisheries and Wildlife. Westborough, MA.

## 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	
Approved by	
Approval date	
Composition (Indicators 10 and 12) based on	Annual Production

## Indicators

### 1. Number and extent of rills:

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### 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):**

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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:**

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