Ecological site R144AY050RI
Subaqueous Haline Flats

Last updated: 10/04/2024
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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): 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.

Ecological site concept

The Subaqueous Haline Flats ecological site consists of very deep, subaqueous soils permanently submerged beneath 10 through 150 cm of tidal estuarine water on flood tidal delta flats, washover fan flats in coastal lagoons and bays. Slope ranges from 0 through 2 percent. Representative soils are Massapog, Nagunt, and Rhodesfolly 0-1 meter depth. Massapog soils are formed in sandy marine and estuarine sediments transported by flood tidal currents. Nagunt soils are formed in sandy marine deposits as a result of washover events, eolian deposition, and tidal flooding. Buried surface horizons and stratification are often identified. The Rhodesfolly soils are formed in sandy marine deposits. Some areas are vegetated with native macroalgae, eelgrass (Zostera marina) and/or widgeonweed (Ruppia maritima). Vegetative cover ranges from 0 to 35 percent. The site is used for recreation and support benthic aquatic habitat. Fishing is commonplace and the species found in the area are smelt, small cod, flounder, scup, menhaden, and white perch. Shellfish farming and recreational harvesting are common.

Associated sites

R144AY047RI	**Subaqueous Haline Glacial Deposits**
R144AY048RI	**Subaqueous Haline Low Energy Basins**
R144AY049RI	**Subaqueous Haline Slopes**

Similar sites

R144AY047RI	**Subaqueous Haline Glacial Deposits**
R144AY048RI	**Subaqueous Haline Low Energy Basins**
R144AY049RI	**Subaqueous Haline Slopes**

Table 1. Dominant plant species

Tree	Not specified
Shrub	Not specified
Herbaceous	(1) *Zostera marina* (2) *Ruppia maritima*

Physiographic features

The Subaqueous Haline Flats ecological site consists of very deep, subaqueous soils permanently submerged beneath 10 through 150 cm of tidal estuarine water on flood tidal delta flats, washover fan flats in coastal lagoons and bays.

Table 2. Representative physiographic features

Landforms	(1) Estuary > Flood-tidal delta flat (2) Bay > Lagoon (3) Washover-fan flat (4) Washover-fan slope (5) Beach (6) Shoal (7) Bay bottom (8) Washover fan
Runoff class	Negligible
Elevation	0 m
Slope	0 – 20 %

Water table depth	0 cm
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)	140-180 days
Freeze-free period (characteristic range)	170-220 days
Precipitation total (characteristic range)	1,170-1,220 mm
Frost-free period (actual range)	120-180 days
Freeze-free period (actual range)	140-220 days
Precipitation total (actual range)	1,120-1,250 mm
Frost-free period (average)	160 days
Freeze-free period (average)	190 days
Precipitation total (average)	1,190 mm

- (1) NEWPORT STATE AP [USW00014787], Middletown, RI
- (2) GROTON NEW LONDON AP [USW00014707], Groton, CT
- (3) PLYMOUTH MUNI AP [USW00054769], Carver, MA
- (4) WESTERLY STATE AP [USW00014794], Westerly, RI
- (5) BRIDGEPORT SIKORSKY MEM AP [USW00094702], Stratford, CT
- (6) TETERBORO AP [USW00094741], Moonachie, NJ

Influencing water features

The Subaqueous Haline Flats ecological site consists of very deep, subaqueous soils permanently submerged beneath 10 through 150 cm of tidal estuarine water on flood tidal delta flats, washover fan flats in coastal lagoons and bays.

Wetland description

National Wetland Classification (Cowardin et al., 1979):

System: Marine/estuarine

Subsystem: Subtidal

Class: Unconsolidated Bottom, Aquatic Bed, Unconsolidated Shore, Emergent

Subclass: Cobble-Gravel, Sand, Mud, Algal, Rooted/Floating Vascular, Organic, Persistent/Non-persistent

Water Regime: Subtidal

Soil features

Representative soils are Massapog, Nagunt, and Rhodesfolly 0-1 meter depth.
Massapog soils are formed in sandy marine and estuarine sediments transported by flood tidal currents. Nagunt soils are formed in sandy marine deposits as a result of washover events, eolian deposition, and tidal flooding. Buried surface horizons and stratification are often identified. The Rhodesfolly soils are formed in sandy marine deposits.

Table 4. Representative soil features

Parent material	(1) Marine deposits (2) Estuarine deposits (3) Eolian deposits
Surface texture	(1) Sand (2) Fine sand (3) Loamy fine sand (4) Loamy sand (5) Loamy coarse sand (6) Mucky loamy fine sand (7) Mucky loamy sand (8) Mucky loamy coarse sand (9) Coarse sand (10) Sandy loam (11) Very fine sandy loam (12) Fine sand (13) Mucky sand
Family particle size	(1) Sandy
Drainage class	Subaqueous

Permeability class	Very slow
Depth to restrictive layer	180 cm
Surface fragment cover <=3"	Not specified
Surface fragment cover >3"	Not specified
Soil reaction (1:1 water) (Depth not specified)	3.9 – 8.8
Subsurface fragment volume <=3" (Depth not specified)	0 – 30 %
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 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).

The Subaqueous Haline Flats ecological site is characterized by the the North Atlantic Tidal Sand Flat system (CES201.049), the North Atlantic Intertidal Mudflat system (CES201.050) and the Northern Atlantic Coastal Seagrass Bed system (CES203.246). The site occurs in on flood tidal delta flats, washover fan flats in coastal lagoons and bays. Benthic fauna such as tubeworms, clams, juvenile blue crabs, scallops and juvenile finfish are associated with this soil. Representative soils are Marshneck, and Nagunt. Benthic fauna such as tubeworms, clams, juvenile blue crabs, scallops and juvenile finfish are associated with this soil. Native vegetation includes eelgrass (Zostera marina) and widgeon grass (Ruppia maritma) and /or macroalgae. Vegetation cover ranges from 0 to 35 percent on sloping units of this soil. Areas of this soil are used for recreational fishing and boating. Commercial uses include fishing, boating, shell fishing and aquaculture.

[*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

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 2.1 plant community composition

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

Table 9. Community 2.2 plant community composition

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

Table 10. Community 2.3 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 (%)

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

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Contributors

Nels Barrett, Ph.D.
Michael Margo

Approval

Greg Schmidt, 10/04/2024

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	09/18/2026

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:**
