Ecological site R149BY012MA
Coastal Backbarrier Dune Flats

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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): 149B–Long Island-Cape Cod Coastal Lowland

149B—Long Island-Cape Cod Coastal Lowland This area is in the Embayed Section of the Coastal Plain Province of the Atlantic Plain. It is part of the partially submerged coastal plain of New England. It is mostly an area of nearly level to rolling plains, but it has some steeper hills (glacial moraines). RThe Peconic and Carmans Rivers are on the eastern end of Long Island. The parts of this area in Massachusetts and Rhode Island have no major rivers. This entire area is made up of deep, unconsolidated glacial outwash deposits of sand and gravel. A thin mantle of glacial till covers most of the surface. Some moraines form ridges and higher hills in this area of generally low relief. Sand dunes and tidal marshes are extensive along the coastline.

Classification relationships

USDA-NRCS (USDA, 2006): Land Resource Region (LRR): S—Northern Atlantic Slope Diversified Farming Region Major Land Resource Area (MLRA): 149B—Long Island-Cape Cod Coastal Lowland USDA-FS (Cleland et al., 2007): Province: 221 Eastern Broadleaf Forest Province Section: 221A Lower New England Subsection: 221Ab Cape Cod Coastal Lowland and Islands Subsection: 221An Long Island Coastal Lowland and Moraine

Ecological site concept

The site consists of very deep, moderately well drained soils that are on interdunes, backs of barrier islands, spits and in low-lying areas (that are not wet) along the coastal zone. They are formed in sandy eolian and/or coastal over-wash deposits of marine origin. Slope ranges from 0 through 3 percent. Representative soil is Succotash. The site occurs on the transition from the excessively drained Coastal Dunes ecological site (Hooksan soils) and nearby wetlands, ponds, or marshes. The vegetation most closely coincides with northern bayberry dune shrublands community (Sneddon et al. 2010) however, with wetland border species such as highbush blueberry, inkberry, and black chokeberry other plant communities also occur.

Associated sites

R149BY002MA	**Coastal Dunes** Coastal Dunes

Table 1. Dominant plant species

Tree	(1) *Juniperus virginiana*
Shrub	(1) *Prunus serotina* (2) *Viburnum dentatum*
Herbaceous	(1) *Panicum virgatum*

Physiographic features

The site occurs on interdunes, back barriers of barrier islands, spits and in low-lying areas along the coastal zone and is not subject to flooding/ponding. Slope ranges from 0 through 3 percent.

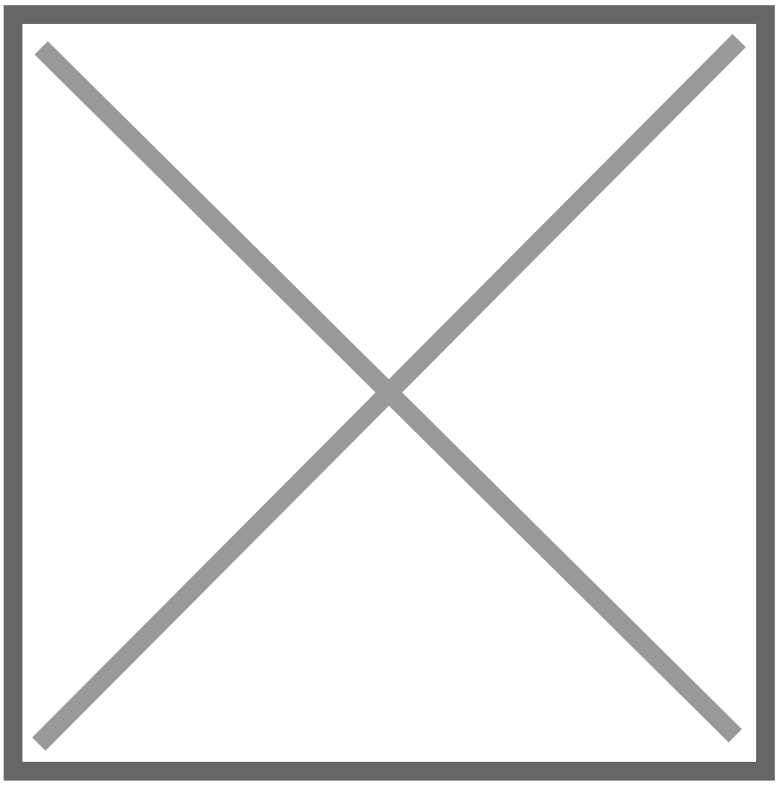

Figure 1.

Table 2. Representative physiographic features

Landforms	(1) Lowland > Back-barrier flat (2) Depression
Runoff class	Very low
Flooding frequency	None to rare
Ponding frequency	None
Elevation	0 – 30 m
Slope	0 %
Water table depth	20 – 70 cm
Aspect	Aspect is not a significant factor

Climatic features

Coastal regions' climate generally considered maritime, experiences a more moderate climate than inland, i.e., cooler summers and warmer winters and delayed onset of spring. However, coastal regions do experience the brunt of extreme weather such as nor'easters and tropical storms, e.g., hurricanes.

Table 3 Representative climatic features

Frost-free period (characteristic range)	120-150 days
Freeze-free period (characteristic range)	160-200 days
Precipitation total (characteristic range)	1,120-1,220 mm
Frost-free period (actual range)	110-160 days
Freeze-free period (actual range)	150-210 days
Precipitation total (actual range)	1,090-1,270 mm
Frost-free period (average)	140 days
Freeze-free period (average)	180 days
Precipitation total (average)	1,170 mm

- (1) VINEYARD HAVEN AP [USW00094724], Edgartown, MA
- (2) HYANNIS [USC00193821], Hyannis, MA
- (3) BRIDGEHAMPTON [USC00300889], Sag Harbor, NY

Influencing water features

Poorly drained
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

The site consists of very deep, poorly to moderately well drained soils that are on interdunes, backs of barrier islands, spits and in low-lying areas along the coastal zone. They are formed in sandy eolian and/or coastal over-wash deposits of marine origin. Representative

soils are Succotash and Atsion.

Table 4. Representative soil features

Parent material	(1) Eolian deposits (2) Marine deposits
Surface texture	(1) Sand (2) Loamy sand
Family particle size	(1) Sandy
Drainage class	Poorly drained to moderately well drained
Permeability class	Slow
Soil depth	180 cm
Surface fragment cover <=3"	Not specified
Surface fragment cover >3"	Not specified
Available water capacity (Depth not specified)	7.62 – 12.7 cm
Soil reaction (1:1 water) (Depth not specified)	3.6 – 7.3
Subsurface fragment volume <=3" (Depth not specified)	0 – 10 %
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 (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 (US FDGC 2008; USNVC 2017). Each association will be named by the diagnostic and often dominant species that occupy the different height strata (tree, shrub, and herb). 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).

[*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.

Thie Coastal Backbarrier Dune Flats ecological site is characterized by a wide mix of moderately well-drained plant communities coinciding with the Northern Atlantic Coastal Plain Dune and Swale system (CES203.264). In this environmental setting, this includes plant communities of dune backbarriers and flats that are not wet, yet moderately influenced by the watertable. The plant communities are quite small, generally not exceeding 0.1 ha (0.25 ac.) hence may be considered “patch” communities (Smith et al. 2008). The prevailing ecological processes are not only due to the maritime environment, including frequent salt spray, wind exposure, overwash, and sand movement, but also local effects due to fluctuating depths to seasonal water table, blowouts, dune migration, distance from salt-spray, and floristic succession. Other disturbances considered as threats include: off-road vehicles, and invasive plants, such as Morrows honeysuckle (Lonicera morrowii).

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 2.1 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 (%)

Inventory data references

Site Development and Testing Plan Future work is needed, as described in a 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, 9/17/2024

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	05/21/2020
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:**

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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:**