USDA Natural Resources Conservation Service

Ecological site F149BY004NY
Wet Lake Plain

Last updated: 9/11/2024
Accessed: 05/13/2025

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

MLRA 149B 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). Ridges border the lower plains. The 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

This site consists of very deep, poorly drained soils that formed in silty estuarine or glacio-lacustrine deposits on glacial lake plains. Representative soil is Raynham (coastal) Wallington, and Canadice.
The reference community in this site is “red maple-swamp white oak” (Edinger et al. 2014). The dominant tree is swamp white oak with red maple. Other trees include pin oak, black gum, and green ash. Characteristic shrubs include winterberry holly, northern arrowwood. Groundcover is commonly ferns: cinnamon fern, royal fern, marsh fern; and sedges: Gray’s sedge, fringed sedge, hop sedge.

Associated sites

F149BY003MA	**Well Drained Lake Plain** Well-drained Lake Plain

Similar sites

F149BY008MA	**Very Wet Outwash** Wet Outwash

Table 1. Dominant plant species

Tree	(1) *Acer rubrum* (2) *Quercus bicolor*
Shrub	(1) *Vaccinium corymbosum*
Herbaceous	Not specified

Physiographic features

The site occurs on nearly level to gently sloping soils in low-lying positions on glaciolacustrine and marine terraces.

Table 2. Representative physiographic features

Landforms	(1) Lake plain (2) Depression
Flooding frequency	None
Ponding frequency	None
Elevation	0–152 m
Slope	0–5%
Water table depth	15–33 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)	164-194 days
Freeze-free period (characteristic range)	207-227 days
Precipitation total (characteristic range)	1,194-1,245 mm
Frost-free period (actual range)	150-197 days
Freeze-free period (actual range)	194-228 days
Precipitation total (actual range)	1,194-1,270 mm
Frost-free period (average)	178 days
Freeze-free period (average)	216 days
Precipitation total (average)	1,219 mm

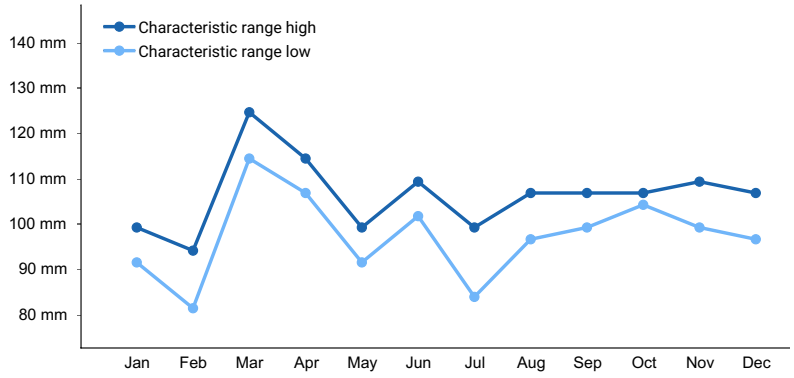


Figure 1. Monthly precipitation range

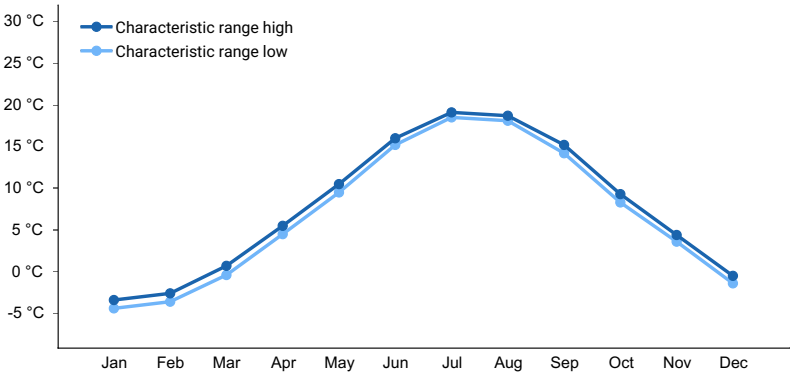


Figure 2. Monthly minimum temperature range

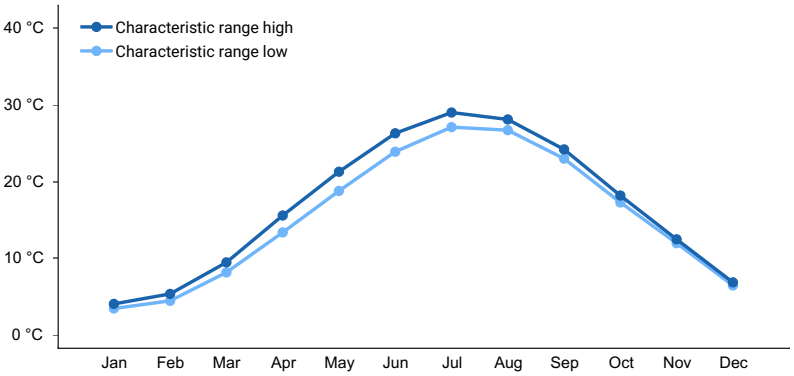


Figure 3. Monthly maximum temperature range

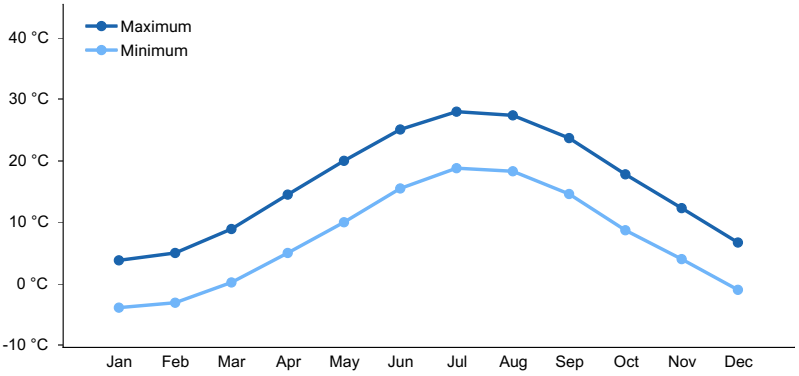


Figure 4. Monthly average minimum and maximum temperature

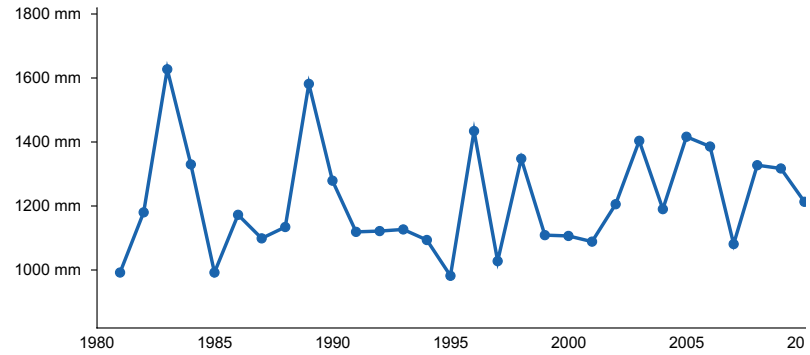


Figure 5. Annual precipitation pattern

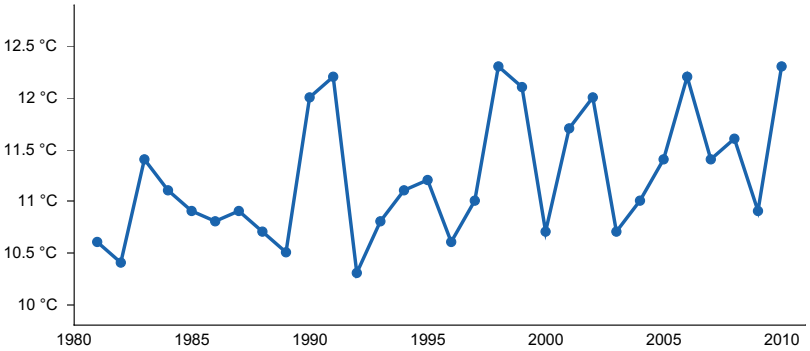


Figure 6. Annual average temperature pattern

Climate stations used

- (1) BRIDGEHAMPTON [USC00300889], Sag Harbor, NY
- (2) GREENPORT PWR HOUSE [USC00303464], Greenport, NY
- (3) MINEOLA [USC00305377], Mineola, NY
- (4) RIVERHEAD RSCH FM [USC00307134], Riverhead, NY

Influencing water features

These sites may be considered depressional or "perched" with seeps, hence maybe considered more minerally-enriched.

Wetland description

The National Wetlands Inventory (NWI) would classify these ecological sites as Palustrine. (Cowardin 1979).

Soil features

This site consists of shallow to very deep, somewhat poorly to poorly drained soils that formed in wind, water, or glacial lake deposits. Representative soils are Raynham, Wallington, and Canadice soils mapped within MLRA 149B.

Table 4. Representative soil features

Parent material	(1) Glaciolacustrine deposits (2) Eolian deposits (3) Alluvium
Surface texture	(1) Silt loam (2) Loam
Family particle size	(1) Coarse-silty (2) Fine

Drainage class	Poorly drained to somewhat poorly drained
Permeability class	Very slow
Depth to restrictive layer	46–183 cm
Soil depth	183 cm
Surface fragment cover <=3"	0%
Surface fragment cover >3"	0%
Available water capacity (0-101.6cm)	10.16–20.32 cm
Soil reaction (1:1 water) (0-101.6cm)	4.5–7.8
Subsurface fragment volume <=3" (Depth not specified)	0%
Subsurface fragment volume >3" (Depth not specified)	0%

Ecological dynamics

[Caveat: The vegetation information contained in this section and is only provisional, based on concepts, not yet validated with field work.*]

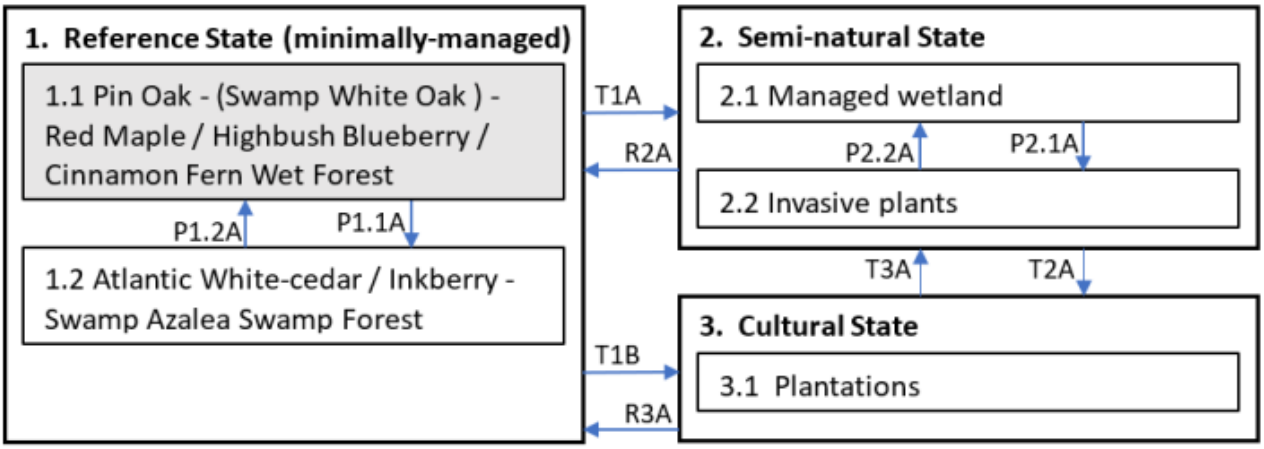
The vegetation groupings described in this section are based on the terrestrial ecological system classification and vegetation associations developed by NatureServe (Comer 2003). Terrestrial ecological systems are specifically defined as a group of plant community types (associations) that tend to co-occur 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.

The Wet Lake Plains ecological site occurs on poorly-drained flats and depressions in protected areas along the coast and is characterized mainly by coastal forests, and variants such as wet “sunken” forests. These wet coastal forests are highly varied and range from deciduous swamps dominanted by red maple to sunken forests dominated by pin oak and swamp white oak to wet evergreen swamps dominated by Atlantic white cedar (*Chamaecyparis thyoides*). These wet lake plains in coastal settings are not well-described but may in part, include vegetation within the Northern Atlantic Coastal Plain Basin Swamp and Wet Hardwood Forest system (CES203.520) and in part by the Northern Atlantic Coastal Plain Basin Peat Swamp system (CES203.522) (NatureServe 2017).

State and transition model

149BY004 –Wet Lake Plain



Transition	*Drivers/practices*
T1A	disturbance, invasive plant establishment
T1B, T2A	cutting, land clearing, plant establishment
R2A, R3A	herbaceous weed treatment, plant removal, plant establishment, successional management
T3A	abandonment, disturbance, invasive plant establishment
P1.1A	disturbance
P1.2A	succesion
P2.1A	Invasive plant establishment
P2.2A	Invasive plant removal

State 1
Reference State (Wet Lake Plains)

Predominately coastal forests • Northeastern Pin Oak - Swamp White Oak Wet Forest, (Pin Oak - (Swamp White Oak) - Red Maple / Highbush Blueberry / Cinnamon Fern Wet Forest), [*Quercus palustris* - (*Quercus bicolor*) - *Acer rubrum* / *Vaccinium corymbosum* / *Osmunda cinnamomea* Wet Forest], - CEGL006240 • Coastal Plain Atlantic White-cedar Swamp Forest, (Atlantic White-cedar / Inkberry - Swamp Azalea Swamp Forest). [*Chamaecyparis thyoides* / *Ilex glabra* - *Rhododendron viscosum* Swamp Forest], - CEGL006188 Other plant communities may include: • Lower New England Red Maple Swamp Forest, (Red Maple / Swamp Azalea - Coastal Sweet-pepperbush Swamp Forest), [*Acer rubrum* / *Rhododendron viscosum* - *Clethra alnifolia* Swamp Forest], - CEGL006156 • Red Maple / Upright Sedge Wet Woodland, (Red Maple / Upright Sedge - Sensitive Fern Wet Woodland), [*Acer rubrum* / *Carex stricta* - *Onoclea sensibilis* Wet Woodland], - CEGL006119 (Source: NatureServe 2018 [accessed 2019], USNVC 2017 [accessed 2019]).

Community 1.1
Pin Oak - (Swamp White Oak) - Red Maple / Highbush Blueberry / Cinnamon Fern Wet Forest

Northeastern Pin Oak - Swamp White Oak Wet Forest, (Pin Oak - (Swamp White Oak) - Red Maple / Highbush Blueberry / Cinnamon Fern Wet Forest), [*Quercus palustris* - (*Quercus bicolor*) - *Acer rubrum* / *Vaccinium*

corymbosum / *Osmunda cinnamomea* Wet Forest], - CEGL006240 This association is a woody, deciduous, seasonally flooded forest with a closed to partially open canopy, often located on sandy loams or clayey soils of glacial lakeplains in basin areas that are seasonally wet (winter and early spring) with a shallow, perched water table, that may become drier in late summer and early fall creating a hummock-and-hollow microtopography. There is generally some layer that impedes drainage. The canopy is codominated by pin oak (*Quercus palustris*) and/or swamp white oak (*Quercus bicolor*) and red maple (*Acer rubrum*). Common associates include blackgum (*Nyssa sylvatica*) and occasionally bitternut hickory (*Carya cordiformis*) and sometimes eastern hemlock (*Tsuga canadensis*). The shrub layer may be sparse or dense and contains winterberry (*Ilex verticillata*), highbush blueberry (*Vaccinium corymbosum*), smooth arrowood (*Viburnum dentatum*), buttonbush (*Cephalanthus occidentalis*), and sheep laurel (*Kalmia angustifolia*). The sparse herb layer may include cinnamon fern (*Osmunda cinnamomea*), marshfern (*Thelypteris palustris*), Massachusetts fern (*Thelypteris simulata*), sensitive fern (*Onoclea sensibilis*), royal fern *Osmunda regalis*)common woolsedge (*Scirpus cyperinus*), Frank's sedge (*Carex frankii*), fowl mannagrass (*Glyceria striata*), and fringed sedge (*Carex crinita*). (Source: NatureServe 2018 [accessed 2019], USNVC 2017 [accessed 2018]). Cross-referenced plant community concepts (typically by political state): Black Gum - Pin Oak - Swamp White Oak Perched Swamp (Swain 2016) [MA] Red maple - swamp white oak swamp (Edinger et al. 2014) [NY] Mixed Hardwood Swamp Forest (Greller 1977) [NY]

Community 1.2
Atlantic White-cedar / Inkberry - Swamp Azalea Swamp Forest

Coastal Plain Atlantic White-cedar Swamp Forest, (Atlantic White-cedar / Inkberry - Swamp Azalea Swamp Forest). [*Chamaecyparis thyoides* / *Ilex glabra* - *Rhododendron viscosum* Swamp Forest], - CEGL006188 This Atlantic white-cedar swamp occurs in poorly-drained depressions or basins generally overlaying sand and gravel deposits. The canopy is dominated by Atlantic white cedar (*Chamaecyparis thyoides*) or codominated with red maple (*Acer rubrum*). Less frequent canopy associates include pitch pine (*Pinus rigida*), blackgum (*Nyssa sylvatica*), and sometimes eastern white pine (*Pinus strobus*) and occasionally eastern hemlock (*Tsuga canadensis*). The shrub layer is very dense and diverse with sweet pepperbush (*Clethra alnifolia*), inkberry (*Ilex glabra*), northern bayberry (*Morella pensylvanica*), blue huckleberry (*Gaylussacia frondosa*), samp doghobble (Leucothoe racemosa), swamp azalea (*Rhododendron viscosum*), smooth winterberry (*Ilex laevigata*), winterberry (*Ilex verticillata*), black chockberry (*Aronia melanocarpa*), and highbush blueberry (*Vaccinium corymbosum*). The herbaceous layer tends to be sparse or patchy and limited to sunny openings with cinnamon fern (*Osmunda cinnamomea*), marshfern (*Thelypteris palustris*), Virginia chainfern (*Woodwardia virginica*), netted chainfern (*Woodwardia areolata*), Massachusetts fern (*Thelypteris simulata*), eastern teaberry (*Gaultheria procumbens*), sundew (Drosera spp.), purple pitcherplant (*Sarracenia purpurea*), rose pogonia (*Pogonia ophioglossoides*), partridgeberry (*Mitchella repens*), Walter's sedge (*Carex striata*), Collins' sedge (*Carex collinsii*), prickly bogsedge (*Carex atlantica*), and poisen ivy (*Toxicodendron radicans*). The nonvascular layer can several species of peatmoss (Sphagnum), commonly *Sphagnum fallax*, *Sphagnum flavicomans*, *Sphagnum magellanicum*, *Sphagnum pulchrum*, *Sphagnum recurvum*, and *Sphagnum palustre*. (Source: NatureServe 2018 [accessed 2019], USNVC 2017 [accessed 2018]). Coastal Atlantic White Cedar Swamp (Swain 2016) [MA] Coastal plain Atlantic white cedar swamp (Edinger et al. 2014) [NY] Coastal Plain Atlantic White Cedar Swamp (Sneddon et al. 2010) [Cape Cod National Seashore]

Pathway P1.1A
Community 1.1 to 1.2

Disturbance

Pathway P1.2A
Community 1.2 to 1.1

Abandonment, Sucession

State 2
Semi-natural State

Vegetation on lands somewhat conditioned by land use, e.g., managed native plant communities or invasive plant communities.

Community 2.1
Managed forest/woodlands/meadows

Community 2.2
Invasive Plants

Black locust (*Robinia pseudoacacia*), Norway Maple (*Acer platanoides*), tree-of-heaven (*Ailanthus altissima*), winged burningbush (*Euonymus alatus*), Japanese knotweed (*Polygonum cuspidatum*), and oriental bittersweet (Celatrus orbiculatus), multiflora rose (*Rosa multiflora*), wineberry (*Rubus phoenicolasius*), garlic mustard (*Alliaria petiolata*), major celindine (*Chelidonium majus*), ground ivy (*Glechoma hederacea*), and European lily-of-the-valley (*Convallaria majalis*), can characterize the herb layer, which may also include native plants.

Pathway P2.1A
Community 2.1 to 2.2

Disturbance, Invasive species establishment

Pathway P2.2A
Community 2.2 to 2.1

Invasive spp. Control, Forest mgmt.

State 3
Cultural State

Landscapes heavily conditioned by land use, e.g., Plantations / Gardens / Cultivated / Pasture.

Community 3.1
Plantations / Gardens / Cultivated / Pasture

Transition T1A
State 1 to 2

Altered by human-induced disturbance or management, invasive plant establishment

Conservation practices

Tree/Shrub Establishment
Forest Land Management
Forest stand improvement for habitat and soil quality

Transition T1B
State 1 to 3

Disturbance, clearing, cutting, plant establishment

Conservation practices

Brush Management
Land Clearing
Herbaceous Weed Control

Restoration pathway R2A
State 2 to 1

Plant removals, plantings, Invasive plant control, successional mgmt., forestry practices Restoration & Mgmt, Forest Stand Improvement, Early Successional Habitat Development, Upland Wildlife Mgmt, Invasive spp. Control, Plant establishment

Conservation practices

Brush Management
Tree/Shrub Establishment
Early Successional Habitat Development/Management
Forest Stand Improvement
Restoration and Management of Natural Ecosystems
Native Plant Community Restoration and Management
Forest Land Management
Invasive Plant Species Control

Transition T2A
State 2 to 3

Land clearing, cutting, plant establishment

Conservation practices

Brush Management
Land Clearing
Herbaceous Weed Control

Restoration pathway R3A
State 3 to 1

Plant removals, plantings, Invasive plant control, successional mgmt., forestry practices Restoration & Mgmt, Forest Stand Improvement, Early Successional Habitat Development, Upland Wildlife Mgmt, Invasive spp. Control, Plant establishment

Conservation practices

Restoration and Management of Natural Ecosystems
Native Plant Community Restoration and Management

Transition T3A
State 3 to 2

Abandonment, disturbance, invasive plant establishment

Conservation practices

Tree/Shrub Establishment
Forest Stand Improvement
Forest Land Management

Additional community tables

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, 9/11/2024

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	Nels Barrett
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:**

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):**

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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:**
