

## **Ecological site F149BY007NY Moist Outwash**

Last updated: 9/17/2024  
Accessed: 05/14/2025

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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

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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). 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, moderately well drained soils on outwash plains. These soils formed in a thin mantle of loamy outwash deposits overlying stratified sand and gravel. Representative soils are Mineola.

Many of the plant communities are considered maritime if influenced by salt spray from coastal storms or coastal if only influenced by the coastal climate. The representative plant communities are varied but consist largely of oaks (chestnut, black, scarlet, and white), and occasional pines (pitch, white) and red maple e.g., “oak- tuliptree forest” (Edinger et al. 2014); “coastal oak / holly forest” (Edinger et al. 2014); “coastal oak-beech forest” (Edinger et al. 2014); “maritime oak /holly” (Edinger et al. 2014); “maritime post oak forest” (Edinger et al. 2014); plus open sites include “maritime grassland” (Edinger et al. 2014); These sites are very similar to the well-drained counterpart, but are typically more diverse. Influences include development, drought, fire, and invasive plants like winged Euonymous and Asiatic bittersweet.

### **Associated sites**

F149BY006NY	<b>Well Drained Outwash</b> Well-drained Outwash
F149BY008MA	<b>Very Wet Outwash</b> Wet Outwash

## Similar sites

F149BY010MA	<b>Moist Till Uplands</b> Moist Till Upland
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**Table 1. Dominant plant species**

Tree	(1) <i>Quercus velutina</i> (2) <i>Quercus alba</i>
Shrub	(1) <i>Ilex opaca</i> (2) <i>Ilex glabra</i>
Herbaceous	Not specified

## Physiographic features

The site occurs on a variety of landforms and is not subject to flooding/ponding.

**Table 2. Representative physiographic features**

Landforms	(1) Lake plain > Outwash plain (2) Outwash plain > Coastal plain (3) Valley > Depression (4) Terrace (5) Lake plain (6) Lake terrace (7) Lakebed
Runoff class	Very low to very high
Flooding frequency	None
Ponding frequency	None
Elevation	0–640 m
Slope	0–8%
Water table depth	30–91 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)	132-184 days
Freeze-free period (characteristic range)	173-222 days
Precipitation total (characteristic range)	1,143-1,168 mm
Frost-free period (actual range)	112-189 days
Freeze-free period (actual range)	152-227 days

Precipitation total (actual range)	1,118-1,168 mm
Frost-free period (average)	156 days
Freeze-free period (average)	196 days
Precipitation total (average)	1,143 mm

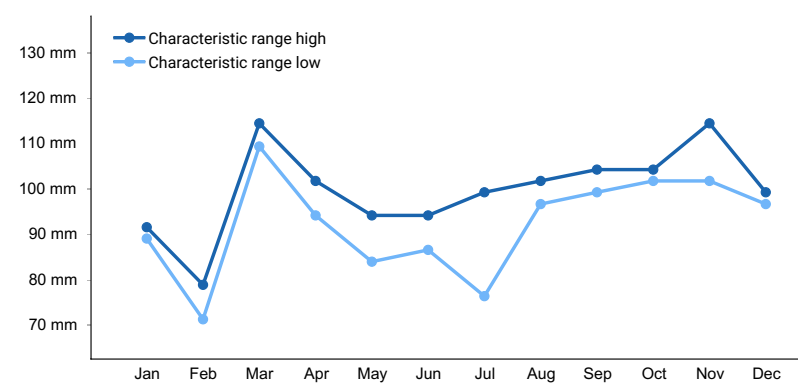


Figure 1. Monthly precipitation range

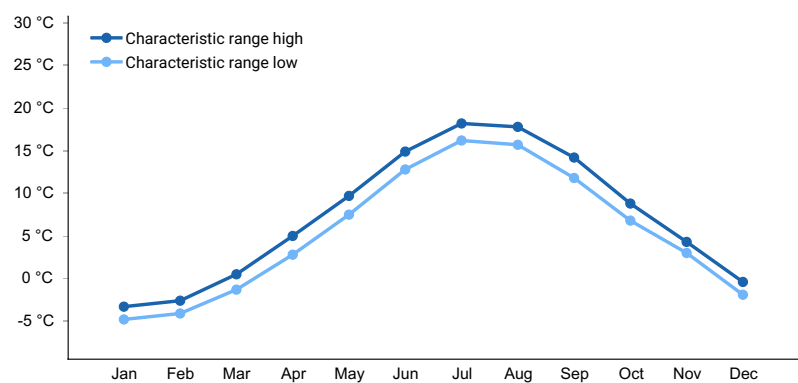


Figure 2. Monthly minimum temperature range

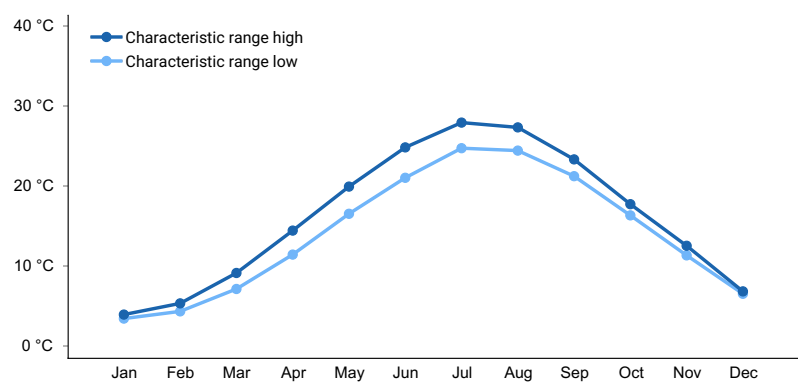
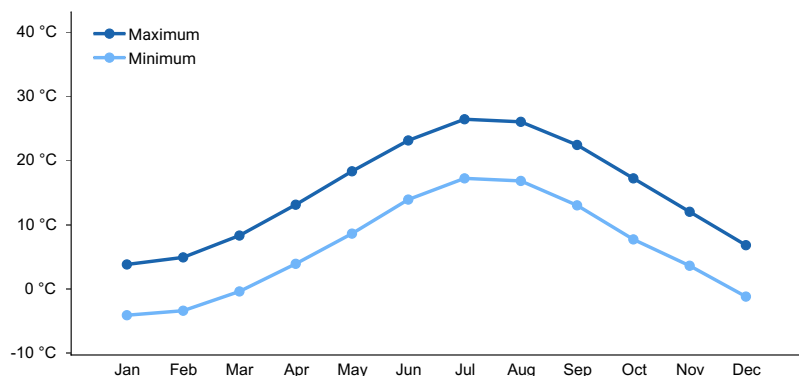
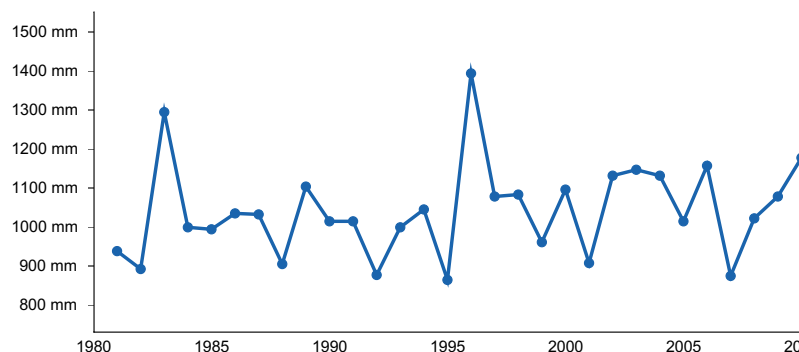


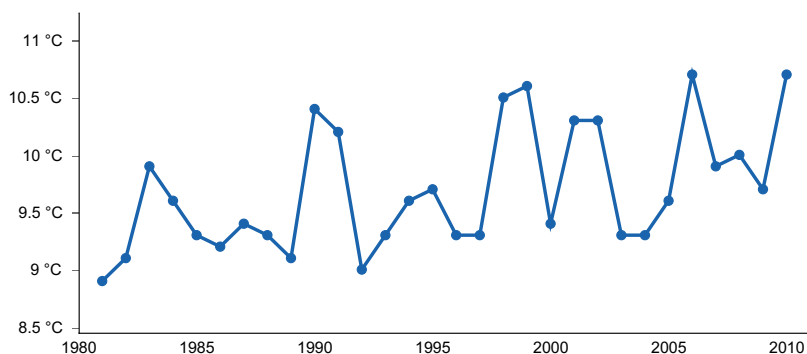
Figure 3. Monthly maximum temperature range



**Figure 4. Monthly average minimum and maximum temperature**



**Figure 5. Annual precipitation pattern**



**Figure 6. Annual average temperature pattern**

## Climate stations used

- (1) MINEOLA [USC00305377], Mineola, NY
- (2) NANTUCKET MEM AP [USW00014756], Nantucket, MA
- (3) VINEYARD HAVEN AP [USW00094724], Edgartown, MA

## Influencing water features

N/A

## Wetland description

N/A

## Soil features

The site consists of moderately to very deep, poorly to moderately well drained soils formed in water, wind, and glacially deposited materials. Representative soils are Amostown, Klej, Mineola, Pipestone, Scio, Sudbury, and Tisbury.

**Table 4. Representative soil features**

Parent material	(1) Glaciofluvial deposits—granite and gneiss (2) Glaciolacustrine deposits—schist (3) Eolian deposits (4) Alluvium (5) Loess (6) Lacustrine deposits (7) Till (8) Marine deposits
Surface texture	(1) Sandy loam (2) Loamy coarse sand (3) Coarse sand (4) Silt loam (5) Very fine sandy loam (6) Fine sandy loam
Family particle size	(1) Coarse-loamy (2) Coarse-silty (3) Coarse-silty over sandy or sandy-skeletal (4) Sandy (5) Sandy-skeletal
Drainage class	Poorly drained to moderately well drained
Permeability class	Very slow to rapid
Depth to restrictive layer	51–183 cm
Surface fragment cover ≤3"	0%
Surface fragment cover >3"	0%
Available water capacity (Depth not specified)	5.08–20.32 cm
Soil reaction (1:1 water) (Depth not specified)	3.5–7.8
Subsurface fragment volume ≤3" (Depth not specified)	2–35%
Subsurface fragment volume >3" (Depth not specified)	0–10%

## 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).

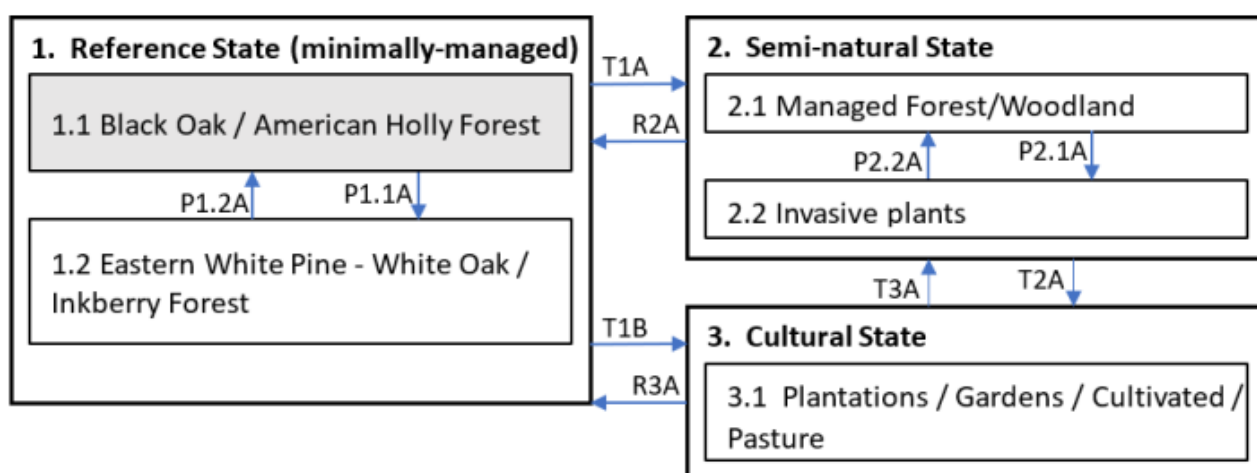
[\*Caveat] The information presented is representative of very complex vegetation communities. Key indicator plants

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 Moist Outwash ecological site, set in moderately-well-drained environments, is characterized by somewhat mesic plant communities with coastal affinities from Long Island, New York, north to Cape Cod, Massachusetts. These plant communities coincide with Northern Atlantic Coastal Plain Dry Oak-Hardwood Forest system(CES203.475). The prevailing ecological processes are related to coastal influences, such as a coastal climate and storms, and if within close proximity to the coast, maritime effects of wind exposure, salt spray, and sand movement. The forest canopy is typically pines (*Pinus*) such as white pine (*Pinus strobus*) or pitch pine (*Pinus rigida*), and/or Oaks (*Quercus*), including black oak (*Q. velutina*), red oak (*Q. rubra*), white oak (*Q. alba*), scarlet oak (*Q. coccinea*), and chesnut oak (*Q. montana*). American holly (*Ilex opaca*) or inkberry (*Ilex glabra*) can be present. Threats include road vehicles, and may include invasive plants such as, but not limited to, black locust (*Robinia pseudoacacia*), tree-of-heaven (*Ailanthus altissima*), autumn olive (*Elaeagnus umbellata*), white poplar (*Populus alba*), multiflora rose (*Rosa multiflora*), Honeysuckles, (*Lonicera* spp.), oriental bittersweet (*Celastrus orbiculatus*), japanese knotweed (*Polygonum cuspidatum*) wineberry (*Rubus phoenicolasius*), Asiatic tearthumb (*Polygonum perfoliatum*). (Source: NatureServe 2018 [accessed 2019], USNVC 2017 [accessed 2019]).

## State and transition model

### 149BY007 – Moist Outwash



Transition	Drivers/practices
T1A	disturbance, invasive plant establishment
T1B, T2A	cutting, land clearing, plant establishment, wind erosion control
R2A, R3A	herbaceous weed treatment, plant removal, plant establishment, successional management
T3A	abandonment, disturbance, invasive plant establishment
P1.1A	disturbance, greater fire frequency
P1.2A	succession
P2.1A	invasive plant establishment, succession
P2.2A	invasive plant management
P3.1	changing land management

## State 1

### Reference State (Moist Outwash)

The predominant plant communities of the Moist Outwash ecological site Reference State (minimally-managed) include: • North Atlantic Coastal Oak / Holly Forest, (Black Oak / American Holly Forest), [*Quercus velutina* / *Ilex opaca* Forest] - CEGL006378 • Coastal White Pine - White Oak Forest, (Eastern White Pine - White Oak / Inkberry Forest), [*Pinus strobus* - *Quercus alba* / *Ilex glabra* Forest], - CEGL006382 • Northeastern Dry Oak - Hickory Forest, Oak (White Oak, Northern Red Oak, Black Oak) - Hickory species / Mapleleaf Viburnum Forest), [*Quercus* (*alba*, *rubra*, *velutina*) - *Carya* spp. / *Viburnum acerifolium* Forest], - CEGL006336 (Source: NatureServe 2018 [accessed 2019], USNVC 2017 [accessed 2019]).

## Community 1.1

### Black Oak / American Holly Forest

North Atlantic Coastal Oak / Holly Forest, (Black Oak / American Holly Forest), [*Quercus velutina* / *Ilex opaca* Forest] - CEGL006378 This forest occurs on mesic, moderately well-drained silts and sandy loams in low areas on the landscape that are sheltered from direct maritime influences. Canopy dominants include Oaks (*Quercus*) predominately black oak (*Q. velutina*) and white oak (*Q. alba*), as well as American beech (*Fagus grandifolia*), red maple (*Acer rubrum*), and blackgum (*Nyssa sylvatica*). American holly (*Ilex opaca*) is abundant in the subcanopy. Other associated species of lesser cover include Canada serviceberry (*Amelanchier canadensis*), and sassafras (*Sassafras albidum*). Shrubs are common and include highbush blueberry (*Vaccinium corymbosum*), American witchhazel (*Hamamelis virginiana*), smooth arrowwood (*Viburnum recognitum*) [= *V. dentatum* var. *lucidum*], and mountain laurel (*Kalmia latifolia*). Vines are common but not usually abundant, and include such species as poison ivy (*Toxicodendron radicans*), Virginia creeper (*Parthenocissus quinquefolia*), roundleaf greenbrier (*Smilax rotundifolia*), cat greenbrier (*Smilax glauca*), and grapes (*Vitis* spp.). Characteristic herbs include starflower (*Trientalis borealis*), Swan's sedge (*Carex swanii*), and New York fern (*Thelypteris noveboracensis*). (Source: NatureServe 2018 [accessed 2019], USNVC 2017 [accessed 2019]). Cross-referenced plant community concepts (typically by political state): Coastal Forest/Woodland (Swain Swain 2016) [MA] Coastal oak-holly forest (Edinger et al. 2014) [NY]

## Community 1.2

### Eastern White Pine - White Oak / Inkberry Forest

Coastal White Pine - White Oak Forest, (Eastern White Pine - White Oak / Inkberry Forest), [*Pinus strobus* - *Quercus alba* / *Ilex glabra* Forest], - CEGL006382 This forest is dominated by white pine (*Pinus strobus*), white oak (*Quercus alba*), and black oak (*Quercus velutina*) in the canopy with occasional pitch pine (*Pinus rigida*). The shrub layer is characterized by highbush blueberry (*Vaccinium corymbosum*), blue huckleberry (*Gaylussacia frondosa*), and inkberry (*Ilex glabra*). The herb layer contains wintergreens (*Pyrola* spp.), Indianpipe (*Monotropa uniflora*), checkered rattlesnake-plantain (*Goodyera tessellata*), and several ferns, New York fern (*Thelypteris noveboracensis*). (Source: NatureServe 2018 [accessed 2019], USNVC 2017 [accessed 2019]). Cross-referenced plant community concepts (typically by political state): Coastal Forest/Woodland (Swain Swain 2016) [MA] Successional southern hardwoods (Edinger et al. 2014) [NY]

## Pathway P1.1A

### Community 1.1 to 1.2

Disturbance, greater fire frequency, coastal proximity

## Pathway P1.2A

### Community 1.2 to 1.1

Succession, Reduced fire frequency

## 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 Woodland**

## **Community 2.2**

### **Invasive Plant Community**

White poplar (*Populus alba*), winged burningbush (*Euonymus alatus*), Japanese knotweed (*Lonicera japonica*), oriental bittersweet (*Celastrus orbiculatus*)

### **Pathway P2.1A**

#### **Community 2.1 to 2.2**

Invasive plant establishment

### **Pathway P2.2A**

#### **Community 2.2 to 2.1**

Invasive Plant Management

#### **Conservation practices**

Invasive Plant Species Control
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## **State 3**

### **Cultural State**

Landscapes heavily conditioned by land use, e.g., Plantations/gardens

## **Community 3.1**

### **Plantations/gardens**

### **Transition T1A**

#### **State 1 to 2**

Disturbance, invasive plant establishment

#### **Conservation practices**

Forest Land Management
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### **Transition T1B**

#### **State 1 to 3**

Cutting, land clearing, plant establishment, wind erosion control

#### **Conservation practices**

Brush Management
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Land Clearing
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## **Restoration pathway R2A**

### **State 2 to 1**

Herbaceous weed treatment, plant removal, plant establishment, successional management



### Conservation practices

Brush Management
Restoration and Management of Natural Ecosystems
Native Plant Community Restoration and Management
Forest Land Management
Invasive Plant Species Control
Monitoring and Evaluation

### Transition T2A

#### State 2 to 3

Cutting, land clearing, plant establishment, wind erosion control

### Conservation practices

Land Clearing
Invasive Plant Species Control
Herbaceous Weed Control

### Restoration pathway R3A

#### State 3 to 1

Herbaceous weed treatment, plant removal, plant establishment, successional management

### Conservation practices

Brush Management
Restoration and Management of Natural Ecosystems
Native Plant Community Restoration and Management
Invasive Plant Species Control
Monitoring and Evaluation
Herbaceous Weed Control

### Transition T3A

#### State 3 to 2

Abandonment, disturbance, invasive plant establishment

### 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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## Other references

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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	05/23/2020
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:**

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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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