

## Ecological site F144BY506ME Semi-rich Till Slope

Last updated: 6/29/2020  
Accessed: 05/03/2024

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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): 144B—New England and Eastern New York Upland, Northern Part

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This major land resource area (MLRA) is characterized by plateaus, plains, and mountains. The climate is generally cool and humid with an average annual precipitation of 34 to 62 inches (865 to 1,575 millimeters). The average annual air temperature is typically 40 to 48 degrees F (4 to 9 degrees C). The freeze-free period generally is 130 to 200 days, but it ranges from 110 days in the higher mountains to 240 days in some areas along the Atlantic coast. The soils in this region are dominantly Entisols, Spodosols, and Inceptisols. They commonly have a fragipan. The dominant suborders are Ochrepts, Orthods, Aquepts, Fluvents, and Sapristis. The soils in the region dominantly have a frigid soil temperature regime with some cryic areas at higher elevation, a udic soil moisture regime, and mixed mineralogy. Most of the land is forested, and 98 percent is privately owned. Significant amounts of forest products are produced including lumber, pulpwood, Christmas trees, and maple syrup. Principal agricultural crops include forage and grains for dairy cattle, potatoes, apples, and blueberries. Wildlife habitat and recreation are important land uses. Stoniness, steep slopes, and poor drainage limit the use of many of the soils.

### Classification relationships

NRCS:

Land Resource Region: R—Northeastern Forage and Forest Region

MLRA: 144B—New England and Eastern New York Upland, Northern Part

### Ecological site concept

This site occurs mostly on well- to moderately well-drained loam soils and associated somewhat poorly-drained soils. Bedrock is greater than 20 inches below the mineral soil surface. Soils are semi-rich due to calcareous bedrock material from which they are derived. This site is commonly found on backslope and footslope positions but may occur on flats or any number of landforms. The vegetation is characterized by northern hardwoods, particularly sugar maple, yellow birch, and beech, with basswood, ash, and northern white cedar as less-abundant indicators of these semi-rich soils. Shallower and wetter inclusions in this site typically produce more of these indicator species. On gentler slopes, these soils are often farmed.

### Associated sites

F144BY507ME	<b>Semi-rich Till Toeslope</b> The Semi-rich Till Toeslope site usually occurs downslope, on wetter, richer soils than the Semi-rich Till Slope.
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F144BY705ME	<p><b>Shallow and Mod-deep Semi-rich Till</b></p> <p>The Shallow and Moderately Deep Semi-rich Till site often occurs upslope of the Semi-rich Till Slope site, where much of the soil area is less than 20 inches deep to calcareous bedrock.</p>
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### Similar sites

F144BY504ME	<p><b>Enriched Loamy Cove</b></p> <p>The Semi-rich Till Slope site is very similar to the Enriched Loamy Cove site, but it derives its nutrients primarily from calcareous parent material and does not accumulate nutrients due to its more exposed landscape position. Therefore it tends to be less rich than the Enriched Loamy Cove.</p>
F144BY501ME	<p><b>Loamy Slope (Northern Hardwoods)</b></p> <p>The Loamy Slope site occurs in a similar landscape position to the Semi-rich Till Slope, but on more acidic soils derived from non-calcareous bedrock.</p>

**Table 1. Dominant plant species**

Tree	(1) <i>Acer saccharum</i> (2) <i>Fraxinus americana</i>
Shrub	Not specified
Herbaceous	Not specified

### Physiographic features

This site occurs mostly on moderate slopes on till landforms, especially hills. It may also be found on somewhat flatter till plains and ground moraine landforms. Slopes are typically 0-35%, sometimes up to 60%. Elevations range from 0-2500 feet above sea level. This site may have a seasonally-high water table within 12-24 inches of the soil surface, but often does not.

**Table 2. Representative physiographic features**

Landforms	(1) Hills > Hill (2) Till plain > Till plain (3) Ice-margin complex > Ground moraine
Flooding frequency	None
Ponding frequency	None
Elevation	0–2,500 ft
Slope	0–35%
Water table depth	0–18 in
Aspect	W, NW, N, NE, E, SE, S, SW

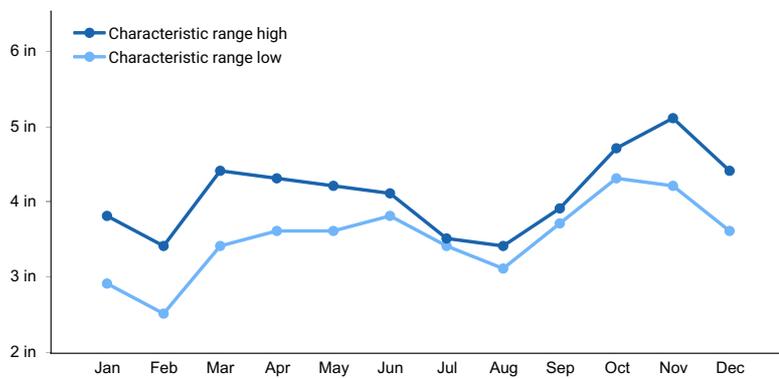
### Climatic features

The climate is humid and temperate. It is characterized by warm summers and cold winters. The average first frost around October 1st and the last freeze of the season occurs around April 23rd. Temperature extremes in the summer can reach as high as 100 degrees F and as low as -33 degrees F in the winter. The average relative humidity is 71 percent. The sun shines on average 57 percent of the time. Bad storm events can come in from the northeast, thus the term “nor’easter”. Winter blizzards can result in several feet of snow, while summer hurricane events can produce 2-3 inches of rain per hour. Annual rainfall occurs quite evenly over the entire year with August being the driest month during the growing season from April through September. Rainfall during this period generally falls during thunderstorms, and fairly large amounts of rain may fall in a short time. Eighty-eight percent of the snowfall occurs from December through March and average total snowfall is 64 inches per year. This makes for a “mud season” from March through April where runoff is high and ponding may occur because surface water runoff is very slow. The original data used in developing the table below was obtained from the USDA-NRCS National Water & Climate Center climate information database. All the climate station monthly averages for maximum and minimum temperature and precipitation were then added together and averaged to make this table. The

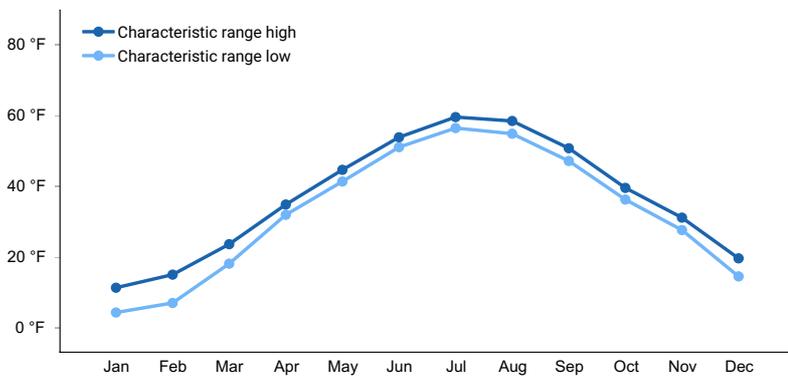
precipitation and temperature data come from the years 1981 through 2010.

**Table 3. Representative climatic features**

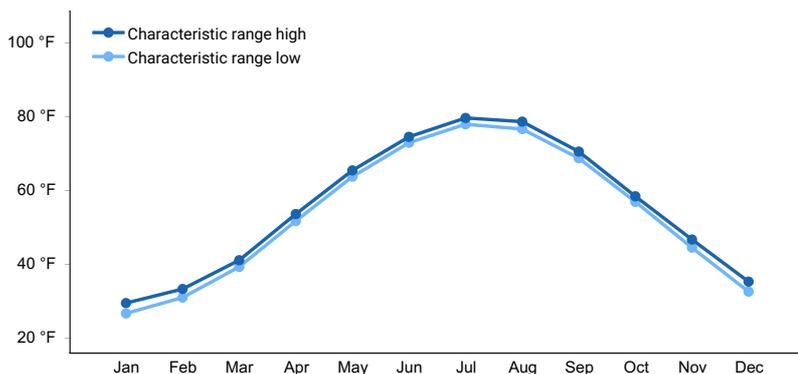
Frost-free period (characteristic range)	117-140 days
Freeze-free period (characteristic range)	144-170 days
Precipitation total (characteristic range)	42-48 in
Frost-free period (actual range)	98-146 days
Freeze-free period (actual range)	133-180 days
Precipitation total (actual range)	40-54 in
Frost-free period (average)	126 days
Freeze-free period (average)	159 days
Precipitation total (average)	46 in



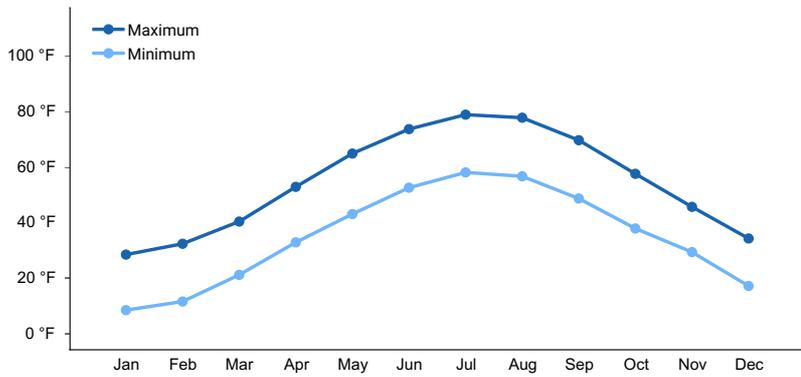
**Figure 1. Monthly precipitation range**



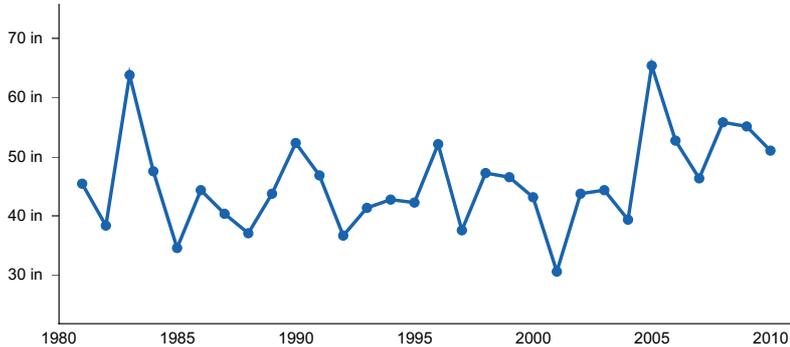
**Figure 2. Monthly minimum temperature range**



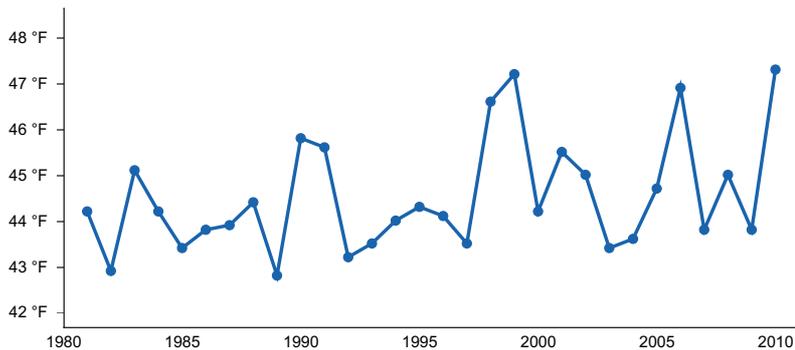
**Figure 3. Monthly maximum temperature range**



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



**Figure 5. Annual precipitation pattern**



**Figure 6. Annual average temperature pattern**

### Climate stations used

- (1) BELFAST [USC00170480], Belfast, ME
- (2) ACADIA NP [USC00170100], Bar Harbor, ME
- (3) CORINNA [USC00171628], Corinna, ME
- (4) DOVER-FOXCROFT WWTP [USC00171975], Dover Foxcroft, ME
- (5) FARMINGTON [USC00172765], Farmington, ME
- (6) GARDINER [USC00173046], Gardiner, ME
- (7) JONESBORO [USC00174183], Addison, ME
- (8) LEWISTON [USC00174566], Auburn, ME
- (9) MADISON [USC00174927], Anson, ME
- (10) NEWCASTLE [USC00175675], Newcastle, ME
- (11) ORONO [USC00176430], Old Town, ME
- (12) WATERVILLE TRTMT PLT [USC00179151], Waterville, ME
- (13) WEST ROCKPORT 1 NNW [USC00179593], Rockport, ME
- (14) AUGUSTA STATE AP [USW00014605], Augusta, ME
- (15) BANGOR INTL AP [USW00014606], Bangor, ME
- (16) PORTLAND INTL JETPORT [USW00014764], Portland, ME

## Influencing water features

This site is not typically influenced by streams or wetlands.

## Soil features

The soils of this site are deep, well- and moderately well-drained. They formed in semi-rich till characterized by circumneutral pH, the lack of a densely compacted subsurface horizon, and few rocks. When present, rock fragments are usually soft, and easy to break with your fingers.

Soil textures are loams to sandy loams throughout the profile. Soil pH increases with depth and ranges from 4.5 to 7.3. Often the soil surface is bare of leaf litter.

This site may include patches of moderately deep soils, with lithic bedrock within 20 to 40 inches of the soil surface. In these areas, as well as in wetter drainageways, cedar tends to be more abundant in the plant community. These patches tend to be embedded within a larger matrix of soils that are more typical of this ecological site.

Representative soils are Pittsfield, Colrain, Buckland, Lombard, Vershire, Dummerston, Penobscot, Wassookeag, and Seabasticook.

**Table 4. Representative soil features**

Parent material	(1) Till–metamorphic rock
Surface texture	(1) Loam (2) Fine sandy loam (3) Very fine sandy loam
Drainage class	Very poorly drained to poorly drained
Soil depth	20 in
Surface fragment cover <=3"	0%
Surface fragment cover >3"	0–2%
Available water capacity (Depth not specified)	2.9–7.9 in
Soil reaction (1:1 water) (Depth not specified)	4.5–7.3
Subsurface fragment volume <=3" (Depth not specified)	3–19%
Subsurface fragment volume >3" (Depth not specified)	0–7%

## Ecological dynamics

The vegetation is characterized by northern hardwoods, particularly sugar maple, yellow birch, and beech, with basswood, ash, and northern white cedar as less-abundant indicators of these semi-rich soils. Christmas fern is often present in the understory. Wetter inclusions in this site typically produce more of these indicator species. Historically, American chestnut would also be dominant on this site, but currently it has been all but eliminated from the region by chestnut blight.

When forested, treethrow and logging are the most common disturbances on this site. The site is resilient following these disturbances and succeeds through an herbaceous and shrubby phase prior to tree establishment and eventual return to the reference community.

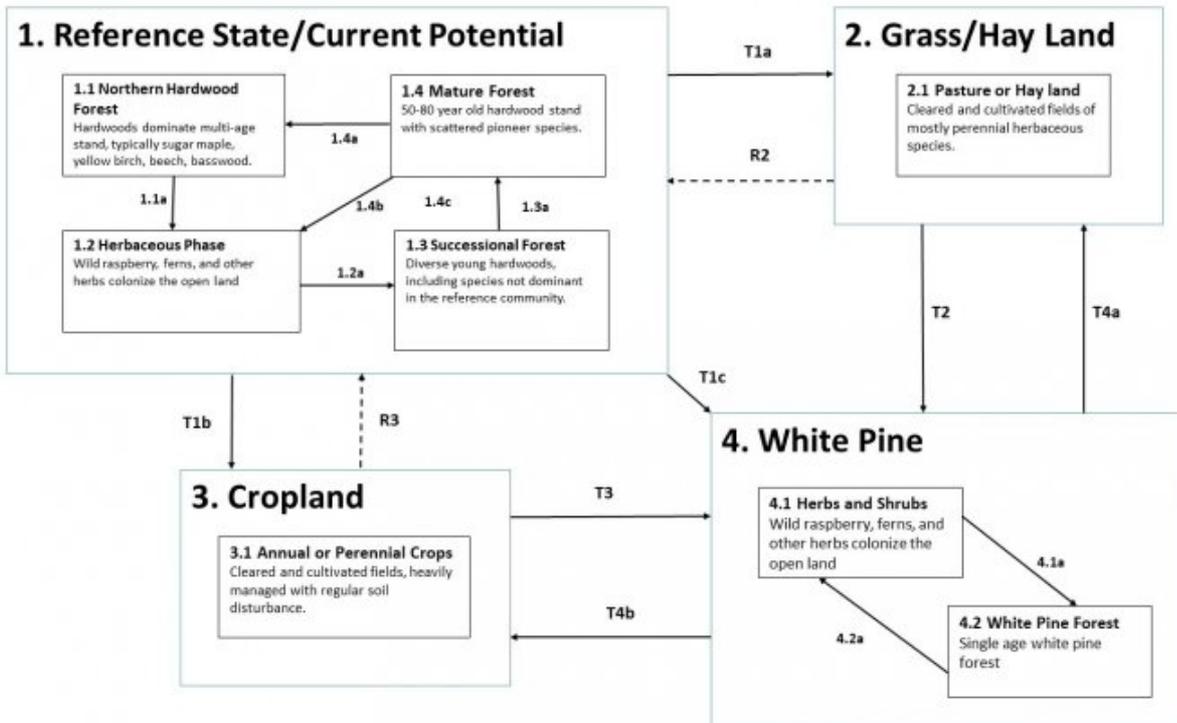
On gentler slopes, this site is often cultivated for crop or pasture given the richness of the soil. When cropland or pastureland management ceases, as occurred across most of the area in the late 19th century, the site either returns to hardwoods or may transition to a white pine forest. Once white pine is established, it tends to form a single age stand with low diversity and little understory.

This site includes the following state natural heritage program types:

- Semi-rich mesic sugar maple forests (Sperduto and Nichols 2004)
- Enriched Northern Hardwoods Forest (Gawler and Cutko 2010)
- Sugar Maple Forest (Gawler and Cutko 2010)
- Semi-rich mesic sugar maple forests (Thompson and Sorenson 2000)

## State and transition model

### F144BY506ME – Semi-rich Till Slope



## State 1

### Reference State / Current Potential

#### Community 1.1

##### Northern Hardwood Forest

Hardwoods dominate multi-age stand, typically sugar maple, cedar yellow birch, basswood, and ash.

#### Community 1.2

##### Herbaceous Phase

Wild raspberry, ferns, and other herbs colonize the open land

#### Community 1.3

##### Successional Forest

Diverse young hardwoods, including species not dominant in the reference community

#### Community 1.4

##### Mature Forest 50-80 yr

50-80 year old hardwood stand with scattered pioneer species

**Pathway P1.1-1.2**  
**Community 1.1 to 1.2**

windthrow, blowdown, fire

**Pathway P1.2-1.3**  
**Community 1.2 to 1.3**

vegetation development (succession)

**Pathway P1.3-1.4**  
**Community 1.3 to 1.4**

vegetation development (succession)

**Pathway P1.4-1.1**  
**Community 1.4 to 1.1**

windthrow, blowdown, fire

**Pathway P1.4-1.2**  
**Community 1.4 to 1.2**

windthrow, blowdown, fire

**State 2**  
**Grassland / Hay land**

**Community 2.1**  
**Pasture or Hay Land**

Cleared and planted fields of mostly perennial herbaceous species.

**State 3**  
**Crop Land**

**Community 3.1**  
**Annual or Perennial Crops**

Cleared and cultivated fields, heavily managed with regular soil disturbance.

**State 4**  
**White Pine**

**Community 4.1**  
**Herbs and Shrubs**

Wild raspberry, ferns, and other herbs colonize the open land

**Community 4.2**  
**White Pine Forest**

Single age white pine forest.

**Pathway P4.1-4.2**

## Community 4.1 to 4.2

Vegetation development (succession)

### Pathway P4.2-4.1

## Community 4.2 to 4.1

harvest, logging

### Conservation practices

Forest Stand Improvement
Forest Land Management

## Transition T1-2

### State 1 to 2

tree removal, pasture or hayfield establishment

### Conservation practices

Clearing and Snagging
Land Clearing
Invasive Plant Species Control
Managed Haying/Grazing

## Transition T1-3

### State 1 to 3

Tree clearing, crop establishment

### Conservation practices

Clearing and Snagging
Cover Crop
Land Clearing

## Transition T1-4

### State 1 to 4

selective harvest

### Conservation practices

Forest Stand Improvement
Forest Land Management

## Transition R2-1

### State 2 to 1

abandonment, vegetation development (succession), planting

### Conservation practices

Tree/Shrub Site Preparation
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Tree/Shrub Establishment
Upland Wildlife Habitat Management
Restoration and Management of Natural Ecosystems
Native Plant Community Restoration and Management
Invasive Plant Species Control
Managed Haying/Grazing

**Transition T2-4**  
**State 2 to 4**

tree establishment

**Conservation practices**

Tree/Shrub Site Preparation
Tree/Shrub Establishment
Invasive Plant Species Control

**Restoration pathway R3-1**  
**State 3 to 1**

abandonment, vegetation development (succession), tree planting

**Conservation practices**

Tree/Shrub Establishment
Upland Wildlife Habitat Management
Tree/Shrub Pruning
Restoration and Management of Natural Ecosystems
Native Plant Community Restoration and Management
Invasive Plant Species Control

**Transition T3-4**  
**State 3 to 4**

tree planting

**Conservation practices**

Tree/Shrub Site Preparation
Tree/Shrub Establishment
Invasive Plant Species Control

**Restoration pathway R4-1**  
**State 4 to 1**

abandonment, vegetation development (succession), plantings

**Conservation practices**

Tree/Shrub Site Preparation
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Tree/Shrub Establishment
Upland Wildlife Habitat Management
Restoration and Management of Natural Ecosystems
Native Plant Community Restoration and Management
Invasive Plant Species Control

## Restoration pathway T4-2

### State 4 to 2

Tree removal, pasture or hay land establishment

#### Conservation practices

Clearing and Snagging
Land Clearing

## Transition T4-3

### State 4 to 3

tree removal, cropland establishment

#### Conservation practices

Clearing and Snagging
Cover Crop
Land Clearing

## 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.

### Other references

Gawler, S. and A. Cutko. 2010. Natural Landscapes of Maine. A Guide to Natural Communities and Ecosystems. Maine Natural Areas Program, Maine Department of Conservation, Augusta, ME.

Johanson, J. K., Butler, N. R. and C. Bickford. 2016. Classifying Northern New England Landscapes for Improved Conservation. *Rangelands* 38:6.

Sperduto, D.D. and W.F. Nichols. 2004. Natural Communities of New Hampshire. New Hampshire Natural Heritage Bureau and The Nature Conservancy.

Thompson, E. H., and E. R. Sorenson. 2000. Wetland, woodland, wildland: A guide to the natural communities of Vermont. The Nature Conservancy and the Vermont Department of Fish and Wildlife. University Press of New England, Hanover, NH. 456 pp.

USDA NRCS 2006. Land resource regions and major land resource areas of the United States, the Caribbean, and

## Contributors

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## Approval

Nels Barrett, 6/29/2020

## Acknowledgments

Nels Barrett, Ph.D.

## 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	05/03/2024
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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