

# Ecological site F144BY601ME

## Dry Sand

Last updated: 6/29/2020  
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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

Table 1. Dominant plant species

Tree	(1) <i>Pinus strobus</i> (2) <i>Picea rubens</i>
Shrub	Not specified
Herbaceous	Not specified

### Physiographic features

This site usually occurs on landforms comprised of sandy glacial outwash deposits such as eskers, kame terraces and outwash plains, and can also occur on sandy till deposits such as moraines and till plains. It can be found from sea level to 3810 feet on slopes ranging from 0 to 45 percent, sometimes up to 60 percent.

Table 2. Representative physiographic features

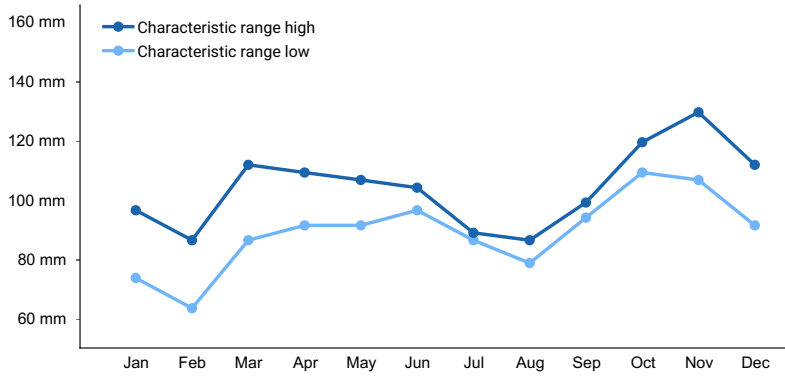
Landforms	(1) Outwash plain (2) Esker (3) Terrace
Flooding frequency	None
Ponding frequency	None
Elevation	0–1,161 m
Slope	0–60%
Ponding depth	0–15 cm
Water table depth	183 cm
Aspect	W, NW, N, NE, E, SE, S, SW

## Climatic features

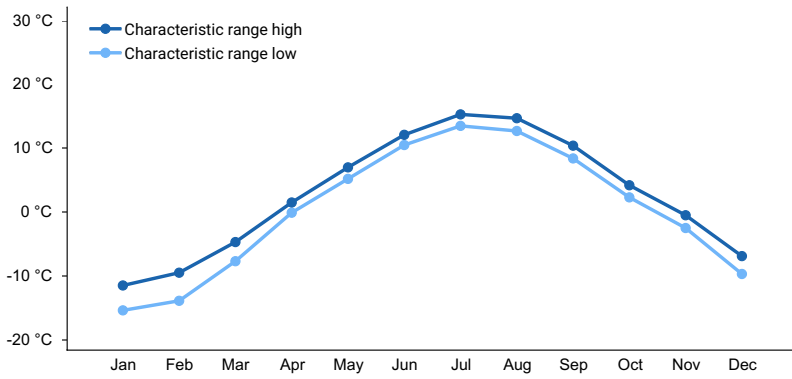
The climate is humid and temperate. It is characterized by warm summers and cold winters. The average first frost around October 1st and the last freeze of the season occurs around April 23rd. Temperature extremes in the summer can reach as high as 100 degrees F and as low as -33 degrees F in the winter. 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**

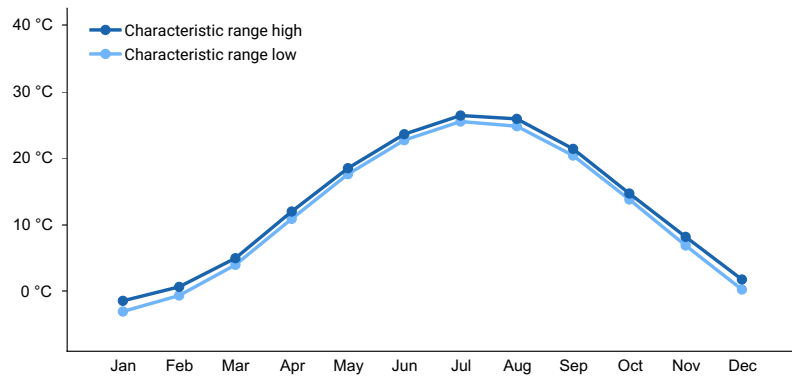
Frost-free period (characteristic range)	117-140 days
Freeze-free period (characteristic range)	144-170 days
Precipitation total (characteristic range)	1,067-1,219 mm
Frost-free period (actual range)	98-146 days
Freeze-free period (actual range)	133-180 days
Precipitation total (actual range)	1,016-1,372 mm
Frost-free period (average)	126 days
Freeze-free period (average)	159 days
Precipitation total (average)	1,168 mm



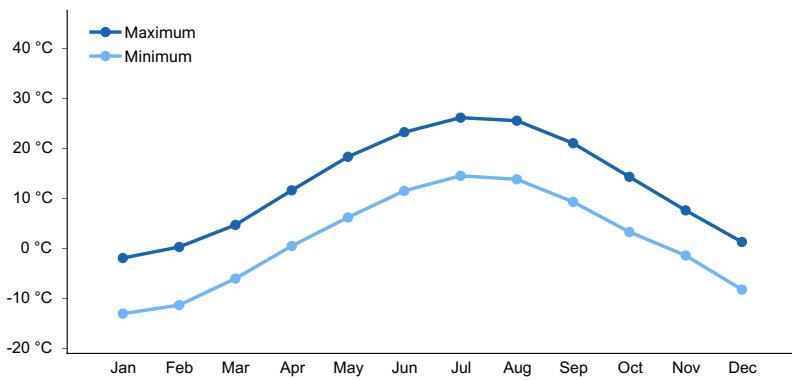
**Figure 1. Monthly precipitation range**



**Figure 2. Monthly minimum temperature range**



**Figure 3. Monthly maximum temperature range**



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

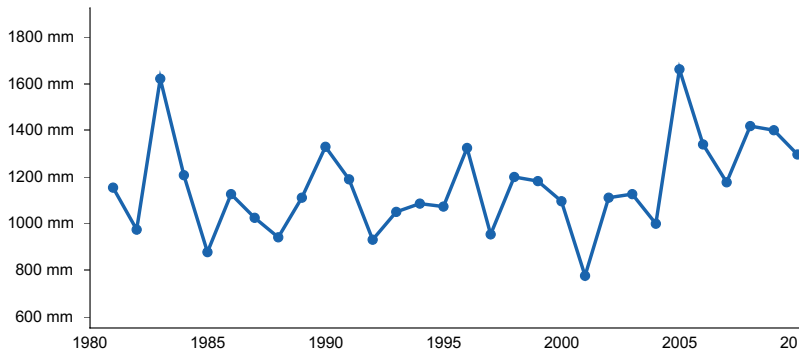


Figure 5. Annual precipitation pattern

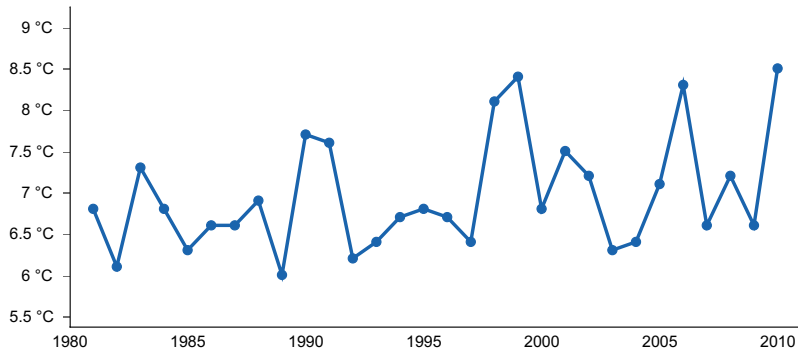


Figure 6. Annual average temperature pattern

## Climate stations used

- (1) 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) WATERTVILLE 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 influenced by streams or wetlands.

## Soil features

The soils of this site are sandy throughout, sometimes with a thin sandy loam surface horizon. They formed in glaciofluvial deposits or meltout till deposited by receding glaciers. Rock fragments may or may not be present on the soil surface and throughout the profile. These soils are well- to excessively-drained.

The representative soils are Colton, Adams, Monadnock, Hermon, Udipsamments, Masardis, Hinckley, Windsor, Merrimac, Champlain, Boscawen, Gloucester, Duxbury, Groton, Stetson, Masardis variant, Teago, Pomfret, Windsor variant, and Caesar.

**Table 4. Representative soil features**

Parent material	(1) Glaciofluvial deposits—igneous and metamorphic rock (2) Supraglacial meltout till
Surface texture	(1) Loamy sand (2) Sandy loam (3) Fine sandy loam
Drainage class	Excessively drained to well drained
Soil depth	152 cm
Surface fragment cover <=3"	0%
Surface fragment cover >3"	0–2%
Available water capacity (Depth not specified)	2.54–17.78 cm
Soil reaction (1:1 water) (Depth not specified)	3.5–6.5

### **Ecological dynamics**

This site is typically dominated by red pine, white pine, and/or red spruce. Hemlock and other softwood species may also be abundant, and scattered hardwoods may be present. The understory is generally sparse.

On gentler slopes, this site has been cleared and cultivated for pasture/hayland or crop production. Blueberries are particularly suited to these sandy soils.

Gravel and sand mining are common on this site, and often accompanied by heavy logging to remove timber prior to soil excavation. Following cutting, early successional species such as fir, white birch, pin cherry, and aspen may enter the community, but they die out as the forest reaches maturity within about 80 years.

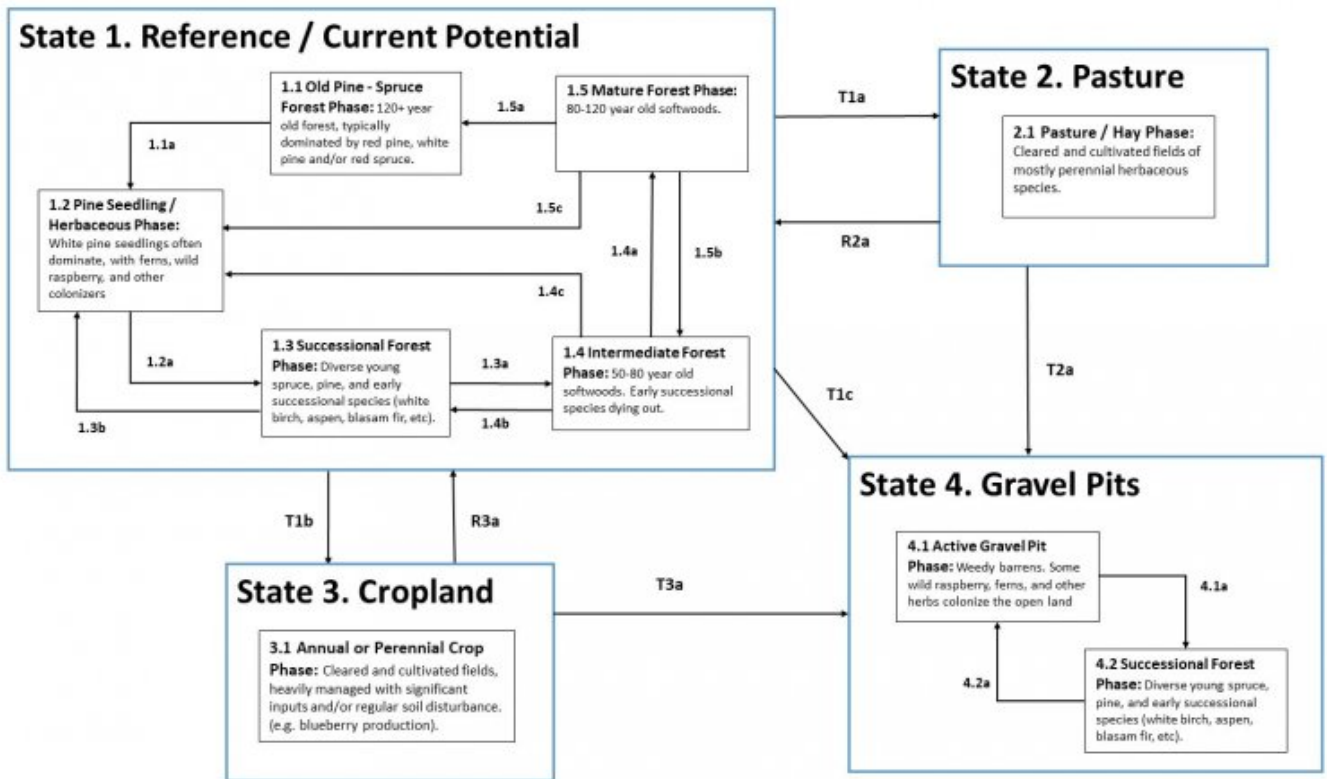
Further study is required to understand plant community dynamics on this site.

This site includes the following state natural heritage program types:

- Red and White Pine Forest (Sperduto and Nichols 2004)
- Red and White Pine Forests (Gawler and Cutko 2010)
- White Pine Forests (Gawler and Cutko 2010)

### **State and transition model**

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## State 1 Reference/ Current Potential

### Community 1.1 Old Pine - Spruce Forest Phase: 120+Yrs

120+ year old forest, typically dominated by red pine, white pine and/or red spruce.

#### Dominant plant species

- eastern white pine (*Pinus strobus*), tree
- red spruce (*Picea rubens*), tree

### Community 1.2 Pine Seedling/ Herbaceous Phase

White pine seedlings often dominate, with ferns, wild raspberry, and other colonizers.

#### Dominant plant species

- eastern white pine (*Pinus strobus*), tree

### Community 1.3 Successional Forest Phase

Diverse young spruce, pine, birch, aspen, etc.

### Community 1.4 Intermediate Forest Phase: 50 - 80 yrs

50-80 year old softwoods. Early successional species dying out.

### **Community 1.5**

#### **Mature Forest Phase: 80 - 120 yrs**

80-120 year old hardwoods and softwoods.

### **Pathway P1.1-1.2**

#### **Community 1.1 to 1.2**

clearcutting, blowdown, fire

### **Pathway P1.2-1.3**

#### **Community 1.2 to 1.3**

vegetation development (succession)

### **Pathway P1.3-1.2**

#### **Community 1.3 to 1.2**

selective cutting, forest management

#### **Conservation practices**

Forest Stand Improvement
Forest Land Management
Forest Management Plan - Written
Forest Management Plan - Applied

### **Pathway P1.3-1.4**

#### **Community 1.3 to 1.4**

vegetation development (succession)

### **Pathway P1.4-1.2**

#### **Community 1.4 to 1.2**

selective cutting, forest management

#### **Conservation practices**

Forest Stand Improvement
Forest Land Management
Forest Management Plan - Written
Forest Management Plan - Applied

### **Pathway P1.4-1.3**

#### **Community 1.4 to 1.3**

selective cutting, forest management

#### **Conservation practices**

Forest Stand Improvement
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Forest Land Management
Forest Management Plan - Written
Forest Management Plan - Applied

**Pathway P1.4-1.5**  
**Community 1.4 to 1.5**

vegetation development (succession)

**Pathway P1.5-1.1**  
**Community 1.5 to 1.1**

cutting, logging, fire

**Conservation practices**

Upland Wildlife Habitat Management
Forest Trails and Landings
Forest Stand Improvement
Record Keeping
Forest Land Management
Forest Management Plan - Written
Forest Management Plan - Applied
Forest stand improvement for habitat and soil quality

**Pathway P1.5-1.2**  
**Community 1.5 to 1.2**

selective cutting, forest management

**Pathway P1.5-1.4**  
**Community 1.5 to 1.4**

selective cutting thinning, forest management

**Conservation practices**

Forest Stand Improvement
Forest Land Management
Forest Management Plan - Written
Forest Management Plan - Applied

**State 2**  
**Pasture**

**Community 2.1**  
**Pasture/Hay Phase**

Cleared and cultivated fields of mostly perennial herbaceous species.

**State 3**



## **Cropland**

Cleared and cultivated fields, heavily managed with significant inputs and/or regular soil disturbance. (e.g. blueberry production).

### **Community 3.1**

#### **Annual or Perennial Crop Phase**

: Cleared and cultivated fields, heavily managed with significant inputs and/or regular soil disturbance. (e.g. blueberry production).

## **State 4**

### **Gravel Pits**

### **Community 4.1**

#### **Active Gravel Pit Phase**

Weedy barrens. Some wild raspberry, ferns, and other herbs colonize the open land

### **Community 4.2**

#### **Successional Forest Phase**

Diverse young spruce, pine, and early successional species (white birch, aspen, blasam fir, etc).

### **Pathway P4.1-4.2**

#### **Community 4.1 to 4.2**

abandonment, vegetation development (succession)

#### **Conservation practices**

Tree/Shrub Site Preparation
Tree/Shrub Establishment

### **Pathway P4.2-4.1**

#### **Community 4.2 to 4.1**

clearing and cutting

#### **Conservation practices**

Clearing and Snagging
Land Clearing

## **Transition T1-2**

### **State 1 to 2**

Cutting and clearing, meadow/pasture establishment

#### **Conservation practices**

Brush Management
Clearing and Snagging
Land Clearing
Upland Wildlife Habitat Management

Early Successional Habitat Development/Management
Record Keeping
Native Plant Community Restoration and Management
Invasive Species Pest Management

**Transition T1-3**  
**State 1 to 3**

cutting and clearing, crop establishment

**Conservation practices**

Clearing and Snagging
Land Clearing
Land Smoothing
Record Keeping

**Transition T1-4**  
**State 1 to 4**

cutting and clearing, sand and gravel mining operations (excavation)

**Conservation practices**

Clearing and Snagging
Land Clearing
Monitoring and Evaluation

**Restoration pathway R2-1**  
**State 2 to 1**

abandonment, vegetation development (succession), plantings

**Conservation practices**

Brush Management
Tree/Shrub Site Preparation
Tree/Shrub Establishment
Upland Wildlife Habitat Management
Record Keeping
Invasive Plant Species Control

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

sand and gravel excavation

**Conservation practices**

Land Clearing
Monitoring and Evaluation

## Restoration pathway R3-1

### State 3 to 1

abandonment, vegetation development (succession), plantings

#### Conservation practices

Tree/Shrub Site Preparation
Tree/Shrub Establishment
Upland Wildlife Habitat Management
Record Keeping
Invasive Plant Species Control

## Transition T3-4

### State 3 to 4

sand and gravel excavation

#### Conservation practices

Land Clearing
Monitoring and Evaluation

## Restoration pathway R4-1

### State 4 to 1

forest re-establishment

#### Conservation practices

Tree/Shrub Site Preparation
Land Reclamation, Abandoned Mined Land
Land Reclamation, Currently Mined Land
Spoil Spreading
Tree/Shrub Establishment
Upland Wildlife Habitat Management
Land Grading
Record Keeping
Restoration and Management of Natural Ecosystems
Native Plant Community Restoration and Management
Invasive Plant Species Control

## 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.

USDA NRCS 2006. Land resource regions and major land resource areas of the United States, the Caribbean, and the Pacific Basin. USDA Handbook 296.

## Contributors

Jamin Johanson

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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	08/17/2024
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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