USDA Natural Resources Conservation Service

Ecological site F144BY305ME
Wet Loamy Flat

Last updated: 9/27/2024
Accessed: 05/14/2025

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

This major land resource area (MLRA) is in Maine (56 percent), New Hampshire (22 percent), Vermont (14 percent), Massachusetts (6 percent), Connecticut (1 percent), and New York (1 percent). It makes up about 22,728 square miles (58,864 square kilometers). The MLRA consists of a relatively young landscape shaped by the Laurentide Ice Sheet, which covered the region from 35,000 to 10,000 years ago. Rolling hills of dense basal till converge on ridges of shallow bedrock that were scoured by glacial ice. River valleys that were flooded by melting glacial water or seawater house large expanses of glacial outwash and stratified drift in inland areas and, to a lesser extent, glaciomarine and glaciolacustrine sediment deposits in coastal areas. Organic bogs, ablation till, and alluvial flood plains make up the remaining portions of the MLRA.

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 Saprists. 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 PartMLRA resources
Major Land Resource Area (MLRA): 144B–New England and Eastern New York Upland, Northern Part

Ecological site concept

This site occurs in gently sloping areas near the bottom of watersheds where water saturates glacial till deposits for much of the growing season. Soils are poorly-drained with loamy surface textures and till parent materials. The water table is seasonally high (within 18 inches of the surface) and typically dries out in late summer and fall. This site is typically drier than Loamy Till Swamp and Acidic Swamp sites, is not usually ponded, and does not include a major component of very poorly-drained soils. Red spruce and/or black spruce dominate, sometime intermixed with larch, and balsam fir is common in younger patches. Sphagnum mosses, cinnamon fern and other herbs are often abundant in the understory.

Associated sites

F144BY301ME	**Loamy Till Swamp** The Wet Loamy Flat site occurs on poorly-drained flats, which are somewhat drier and may occur upslope from the Loamy Till Swamp. Wet Flats support more spruce and less cedar.
F144BY503ME	**Loamy Flat** The Loamy Flat site occurs on somewhat-poorly and poorly-drained soil complexes that are somewhat drier and have significantly less understory production than the Wet Loamy Flat site.

Similar sites

F144BY302ME	**Mucky Swamp** Both the Mucky Peat Swamp and the Loamy Till Swamp are dominated by northern white cedar, but the Mucky Peat Swamp is wetter, has a thicker organic soil surface layer, and typically has a more open canopy, allowing more light to reach the forest floor. As a result, the understory is often more productive in the Mucky Peat Swamp.
F144BY301ME	**Loamy Till Swamp** While both sites are derived from loamy lodgment till parent materials, the Wet Loamy Flat is drier than the Loamy Till Swamp, with poorly-drained mineral soils rather than very poorly- and very-poorly drained organic soils and mineral soils. Wet Loamy Flat is dominated by spruce rather than northern white cedar.
F144BY303ME	**Acidic Swamp** The Loamy Wet Flat site is drier than the Acidic Swamp site, with poorly-drained mineral soils rather than very poorly- and very-poorly drained organic soils and mineral soils. Loamy wet flat typically supports more red spruce than black spruce.
F144BY503ME	**Loamy Flat** The Loamy Flat site occurs on somewhat-poorly and poorly-drained soil complexes that are somewhat drier and have significantly less understory production than the Wet Loamy Flat site.

Table 1. Dominant plant species

Tree	(1) *Acer rubrum* (2) *Abies balsamea*
Shrub	Not specified
Herbaceous	Not specified

Physiographic features

This site occurs on gently sloping till plains, ground moraines and hills. Though soils are poorly-drained with a seasonally-high water table, this site does not experience much ponding of water on the soil surface. During dry periods from June to September, the water table may drop to more than 18 inches below the soil surface.

Table 2. Representative physiographic features

Landforms	(1) Till plain > Ground moraine (2) Upland > Hill (3) Upland > Depression (4) Upland > Drainageway (5) Upland > Till plain
Runoff class	Very low to very high
Flooding frequency	None
Ponding frequency	None
Elevation	0–762 m
Slope	0–15%
Water table depth	0–23 cm
Aspect	Aspect is not a significant factor

Climatic features

The climate is humid and temperate and is characterized by warm summers and cold winters. Precipitation generally is evenly distributed throughout the year. Near the coast, it is slightly lower in summer. In inland areas, it is slightly higher in spring and fall. Rainfall occurs during high-intensity, convective thunderstorms in summer. In winter, most of the precipitation occurs as moderate-intensity storms (northeasters) that produce large amounts of rain or snow. Heavy snowfalls commonly occur late in winter. Temperatures and the length of the freeze-free period increase from north to south and closer to the coast.

This major land resource area (MLRA) covers four states and may have substantial climate variability among locations: Maine (56 percent), New Hampshire (22 percent), Vermont (14 percent), Massachusetts (6 percent), Connecticut (1 percent), and New York (1 percent).

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

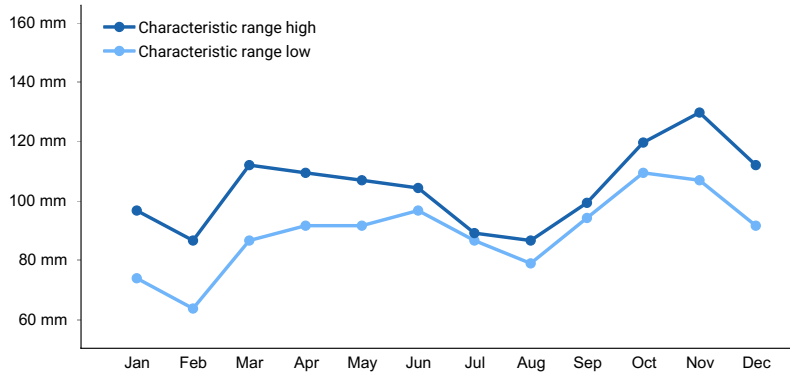


Figure 1. Monthly precipitation range

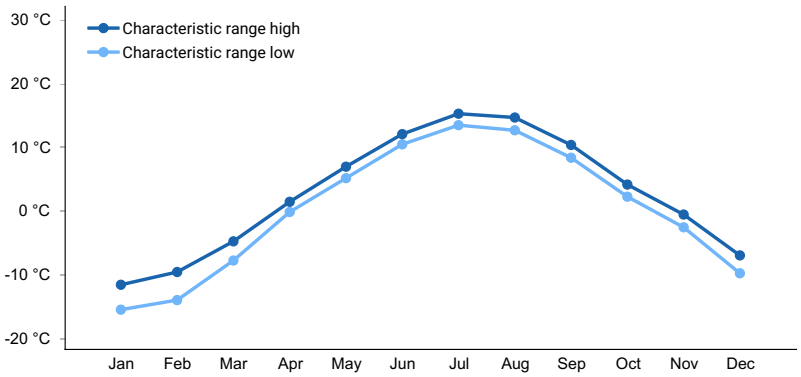


Figure 2. Monthly minimum temperature range

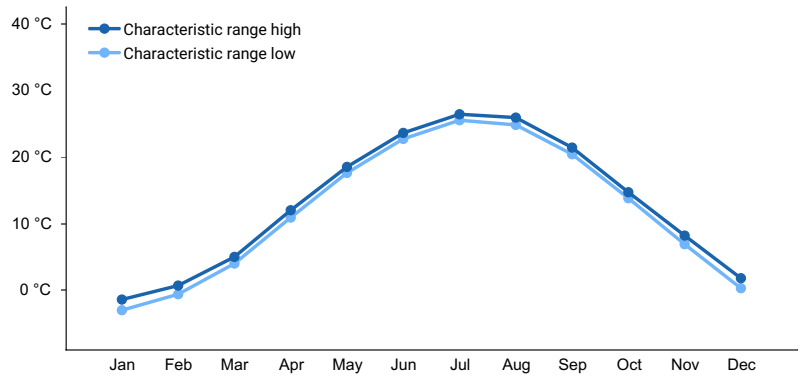


Figure 3. Monthly maximum temperature range

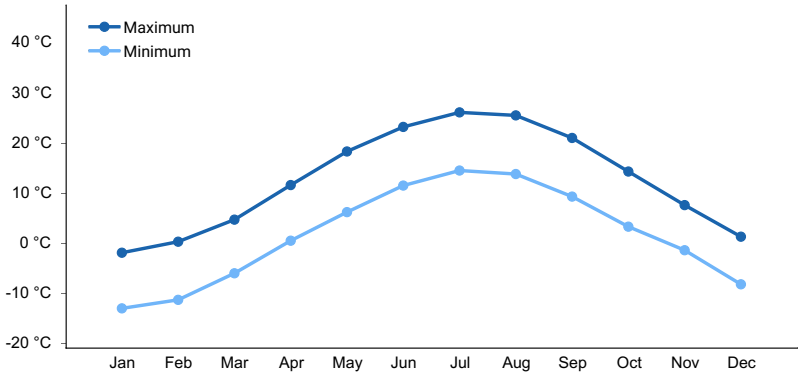


Figure 4. Monthly average minimum and maximum temperature

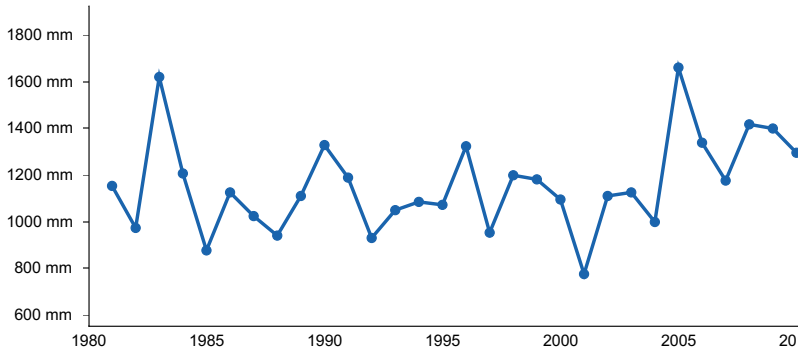


Figure 5. Annual precipitation pattern

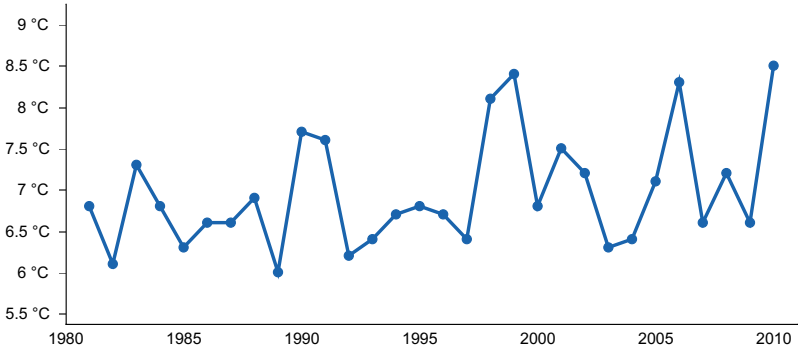


Figure 6. Annual average temperature pattern

Climate stations used

- (1) PORTLAND INTL JETPORT [USW00014764], Portland, ME
- (2) BANGOR INTL AP [USW00014606], Bangor, ME
- (3) BELFAST [USC00170480], Belfast, ME

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

Influencing water features

Large amounts of water move laterally through the poorly-drained soils of this site, however, it typically has enough slope and elevation to minimize ponding on the soil surface.

Wetland description

Wetland Description: Cowardin
System: Palustrine
Subsystem: N/A
Class: Unknown

Soil features

Soils of this site are poorly-drained. They formed in loamy till and often have a thin organic layer at the soil surface. A dense till layer is typically present within ~43 inches of the soil surface, which perches water and impedes root growth. These soils are often strongly acidic.

Table 4. Representative soil features

Parent material	(1) Lodgment till–granite and gneiss (2) Basal till (3) Supraglacial meltout till–mica schist (4) Lodgment till–mica schist (5) Lodgment till–phyllite
Surface texture	(1) Loamy coarse sand (2) Loam (3) Silt loam
Drainage class	Poorly drained
Permeability class	Very slow to moderate
Soil depth	0–152 cm
Surface fragment cover <=3"	0%
Surface fragment cover >3"	2–9%
Available water capacity (2.5-15.2cm)	Not specified
Soil reaction (1:1 water) (8.1-19.8cm)	Not specified
Subsurface fragment volume <=3" (12.7-38.1cm)	Not specified
Subsurface fragment volume >3" (5.1-15.2cm)	Not specified

Ecological dynamics

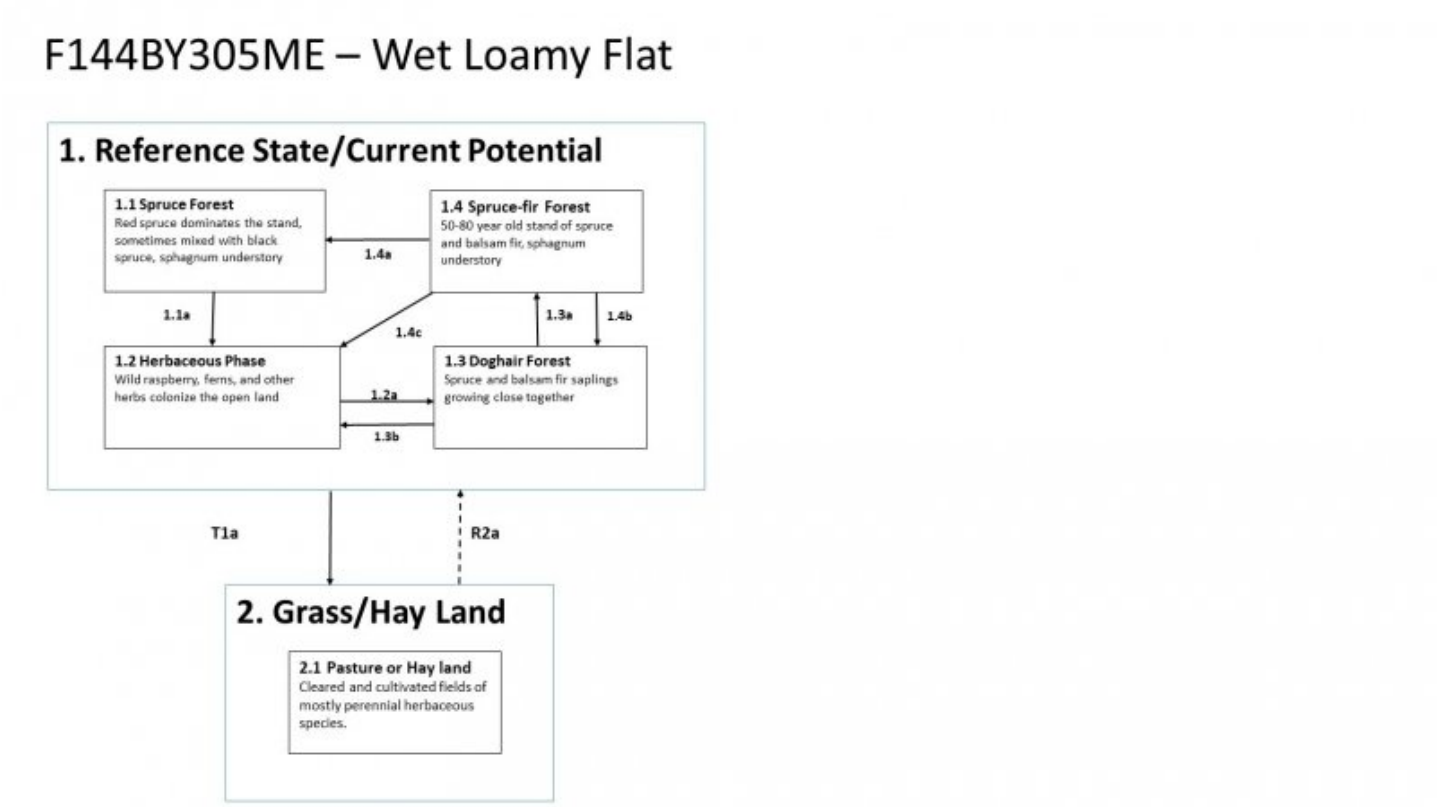
[Caveat: The vegetation information contained in this section and is only provisional, based on concepts, and future projects support validation through field work. *] The vegetation groupings described in this section are based on the terrestrial ecological system classification and vegetation associations developed by NatureServe (Comer et al., 2003) and localized associations provided by the New York Natural Heritage Program (Edinger et al., 2014), Maine Natural Areas Program (Gawler and Cutko, 2010), New Hampshire Natural Heritage Program (Sperduto and Nichols, 2011), and Massachusetts Division of Fisheries and Wildlife (Swain, 2020).

This site is dominated by red spruce, sometimes mixed with black spruce, and a sphagnum moss-cinnamon fern understory. It is often logged, which sets the stand through a series of phases, beginning with herbaceous colonizers, then dense spruce and balsam fir saplings, and eventually to mature spruce-fir forest. Within 100 years, any balsam fir dies out from the overstory, and red spruce once again dominates the site. Similar community dynamics occur within stands on this site as blowdowns or spruce budworm open up small patches of mature overstory trees for establishment by herbs and conifer saplings. Large-scale budworm outbreaks are expected to have result in similar dynamics as large-scale timber harvest.

In some areas this site has been converted to perennial grass hayland.

Relationship to Other Classification Systems
This site includes the following state natural heritage program types:
• Lowland Spruce-fir forests (Sperduto and Nichols 2004)
• Red spruce swamp (Sperduto and Nichols 2004)
• Spruce-fir wet flat (Gawler and Cutko 2010)
• Spruce-fir-tamarack Swamps (Thompson and Sorenson 2000)

State and transition model



State 1

Reference State/Current Potential

Community 1.1
Spruce Forest

Red spruce dominates the stand, sometimes mixed with black spruce, sphagnum understory

Community 1.2
Herbaceous Phase

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

Community 1.3
Doghair Forest

Spruce and balsam fir saplings growing close together

Community 1.4
Spruce-fir Forest

50-80 year old stand of spruce and balsam fir, sphagnum understory

Pathway 1.1a
Community 1.1 to 1.2

Logging or blowdown opens space and light in large or small patch

Conservation practices

Early Successional Habitat Development/Management
Forest Stand Improvement

Pathway 1.2a
Community 1.2 to 1.3

Time, vegetation development

Pathway 1.3b
Community 1.3 to 1.2

Logging or blowdown opens space and light in large or small patch

Pathway 1.3a
Community 1.3 to 1.4

Time, vegetation development

Pathway 1.4a
Community 1.4 to 1.1

Time, self-thinning (balsam fir and other pioneer tree species die out), vegetation development

Pathway 1.4b
Community 1.4 to 1.2

selective harvest

Conservation practices

Forest Land Management

Pathway 1.4b
Community 1.4 to 1.3

Logging or blowdown opens space and light in large or small patch

Conservation practices

Forest Land Management

State 2
Grass/Hay Land

Community 2.1
Pasture or Hayland

Cleared and cultivated fields of mostly perennial herbaceous species.

Transition T1a
State 1 to 2

Tree and stump removal, pasture cultivation

Conservation practices

Clearing and Snagging
Land Clearing

Restoration pathway R2a
State 2 to 1

Time abandonment, vegetation development

Conservation practices

Upland Wildlife Habitat Management

Additional community tables

Inventory data references

Future work is needed, as described in a future 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

Comer, P., D. Faber-Langendoen, R. Evans, S. Grawler, C. Josse, G. Kittel, S. Menard, M. Pyne, M. Reid, K. Schultz, K. Snow, and J. Teague. 2003. Ecological Systems of the United States: A Working Classification of U.S. Terrestrial Systems. NatureServe, Arlington, Virginia

Edinger, G. J., D. J. Evans, S. Gebauer, T. G. Howard, D. M. Hunt, and A. M. Olivero (editors). 2014. Ecological Communities of New York State. Second Edition. A revised and expanded edition of Carol Reschke's Ecological Communities of New York State. New York Natural Heritage Program, New York State Department of Environmental Conservation, Albany, NY.

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, Maine.

NatureServe. 2021. NatureServe Explorer: An online encyclopedia of life [web application]. NatureServe, Arlington, Virginia. https://explorer.natureserve.org/. (accessed 10 July. 2021).

Soil Survey Staff, Natural Resources Conservation Service, United States Department of Agriculture. 2006. Land Resource Regions and Major Land Resource Areas of the United States, the Caribbean, and the Pacific Basin. Agricultural Handbook 296

Soil Survey Staff, Natural Resources Conservation Service, United States Department of Agriculture. Official Soil Series Descriptions. Available online. (accessed 11 Aug. 2021).

Soil Survey Staff, Natural Resources Conservation Service, United States Department of Agriculture. Soil Climate Research Station Data. Available online. (accessed 23 June. 2021).

Soil Survey Staff, Natural Resources Conservation Service, United States Department of Agriculture. Soil Survey Geographic (SSURGO) Database for [MLRA 141, Maine]. Available online. (accessed 14 Oct. 2021).

Sperduto, D.D. and William F. Nichols. 2011. Natural Communities of New Hampshire. 2nd Ed. NH Natural Heritage Bureau, Concord, NH. Pub. UNH Cooperative Extension, Durham, NH.

Swain, P. C. 2020. Classification of the Natural Communities of Massachusetts. Massachusetts Division of Fisheries and Wildlife, Westborough, MA

USNVC [United States National Vegetation Classification]. 2017. United States National Vegetation Classification Database V2.01. Federal Geographic Data Committee, Vegetation Subcommittee, Washington DC. Available The U.S. National Vegetation Classification (usnvc.org) (accessed 2 July. 2021).

Contributors

Christopher Mann

Approval

Nels Barrett, 9/27/2024

Acknowledgments

Nels Barrett and Nick Butler provided considerable review of this ecological site concept.

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	06/29/2020
Approved by	Nels Barrett
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:**

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):**

---

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:**

---

17. **Perennial plant reproductive capability:**
