USDA Natural Resources Conservation Service

Ecological site RX141X305
Wet Loamy Flat

Last updated: 10/03/2024
Accessed: 05/11/2025

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): 141X–Tug Hill Plateau

MLRA 141 is entirely in New York and makes up about 1,173 square kilometers (3,037 square kilometers). It consists of a relatively small but unique upland that lies just off the eastern end of Lake Ontario and west of the Black River Valley and Adirondack Mountain region. It is essentially a north- and east-facing glaciated cuesta scarp and is underlain by thick Wisconsin till and small areas of outwash. Most of the plateau is woodland, so forestry and recreation are the primary uses, but small isolated dairy operations and hobby farms are located around the perimeter.

The area is bordered on the east by the Black River Valley, on the north by the St. Lawrence Lowland, on the west by the Ontario Lowland, and on the south by the Upper Mohawk Valley. The northern and eastern boundaries of MLRA 141 are distinct where they contact the physiographically dissimilar southwestern part of MLRA 142 (St. Lawrence-Champlain Plain). The western and southern boundaries are also distinct where they contact the physiographically dissimilar MLRA 101 (Ontario-Erie Plain and Finger Lakes Region)

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 varying textures and 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 Seepage Bottoms (Cedar), is not usually ponded, and does not include a major component of very poorly-drained soils. Black spruce and red spruce are abundant, with larch common and balsam fir occurring in younger patches. Cinnamon fern and other herbs are often abundant in the understory.

Associated sites

RX141X304	**Wet Clay Flat** Wet Loamy Flat ecological sites may be adjacent to Wet Clay Flat ecological sites.

Similar sites

RX141X503	**Loamy Flat** Wet Loamy Flat ecological sites share many similar vegetative, soil, and physiographic characteristics as Loamy Flat sites, with Loamy Flat sites being wetter.
RX141X304	**Wet Clay Flat** Wet Loamy Flat ecological sites may share similar vegetative composition as Wet Clay Flat sites.

Table 1. Dominant plant species

Tree	(1) *Picea rubens* (2) *Picea mariana*
Shrub	(1) *Viburnum lantanoides* (2) *Lonicera canadensis*
Herbaceous	(1) *Dryopteris intermedia* (2) *Aralia nudicaulis*

Legacy ID

F141XY305NY

Physiographic features

Table 2. Representative physiographic features

Landforms	(1) Depression (2) Bench (3) Hill
Runoff class	Negligible to very high
Flooding frequency	None
Ponding frequency	None to frequent
Elevation	298–2,034 ft
Water table depth	0–7 in
Aspect	Aspect is not a significant factor

Climatic features

Throughout the year precipitation is evenly distributed around most of this area with slightly less rainfall occurring around the lower margins of the plateau. Rainfall occurs as high-intensity, convective thunderstorms during the summer. Lake-effect snowfall is heavy from late autumn to early spring with the summit of the plateau having the lowest temperatures and the shortest freeze-free periods.

Climate stations Watertown and Old Forge are adjacent to the MLRA and were used to tabulate additional representative climate data.

Table 3. Representative climatic features

Frost-free period (characteristic range)	92-124 days
Freeze-free period (characteristic range)	129-159 days
Precipitation total (characteristic range)	47-53 in
Frost-free period (actual range)	86-131 days
Freeze-free period (actual range)	119-164 days
Precipitation total (actual range)	44-57 in
Frost-free period (average)	108 days
Freeze-free period (average)	143 days
Precipitation total (average)	50 in

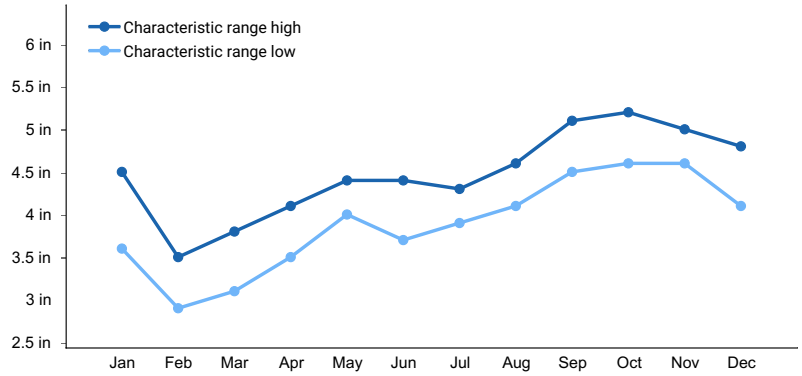


Figure 1. Monthly precipitation range

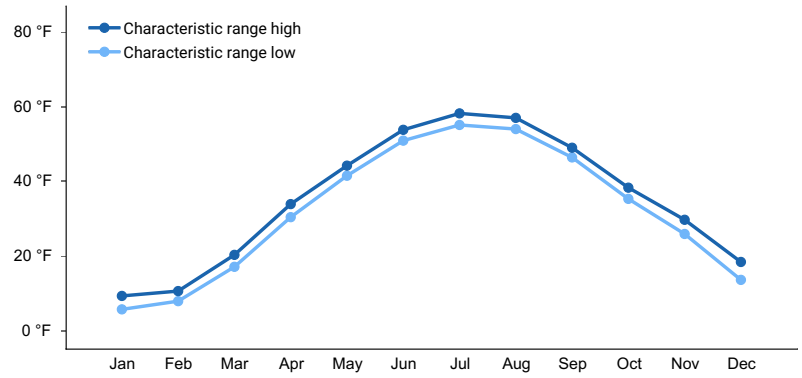


Figure 2. Monthly minimum temperature range

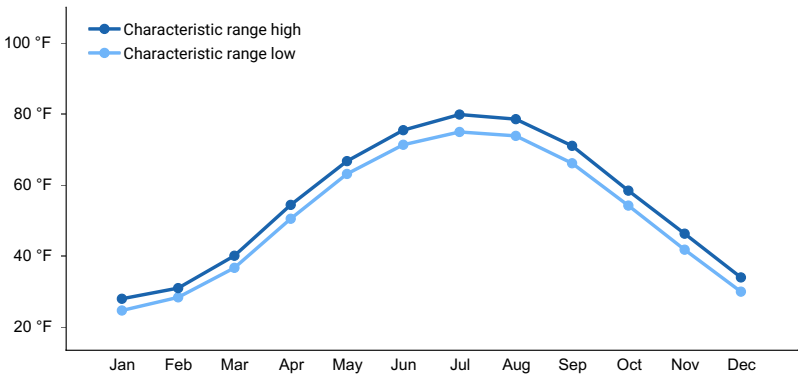


Figure 3. Monthly maximum temperature range

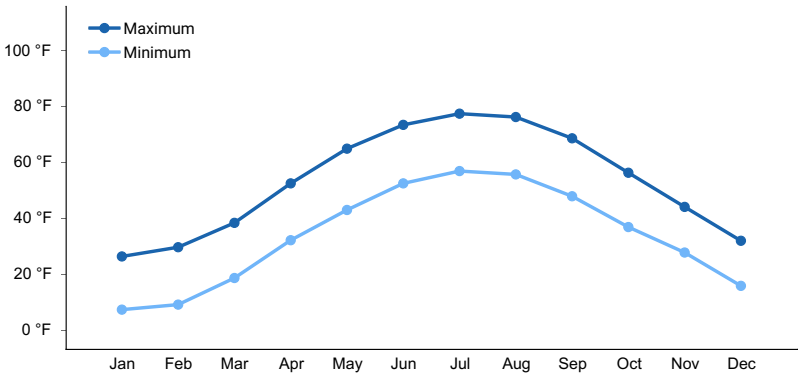


Figure 4. Monthly average minimum and maximum temperature

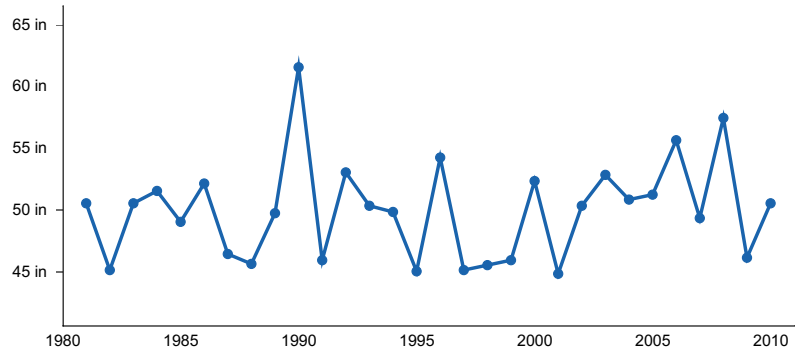


Figure 5. Annual precipitation pattern

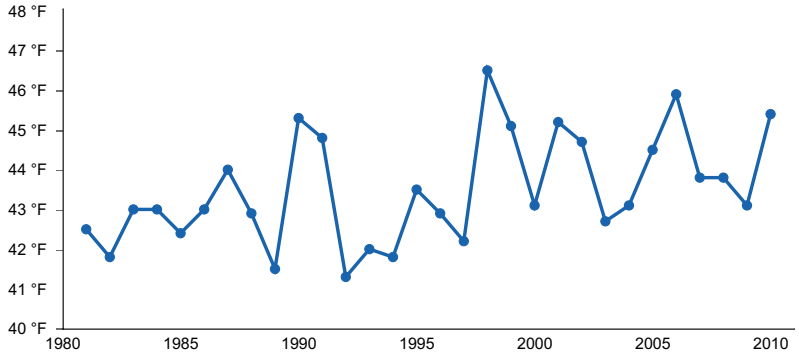


Figure 6. Annual average temperature pattern

Climate stations used

- (1) BOONVILLE 4 SSW [USC00300785], Boonville, NY
- (2) CAMDEN [USC00301110], Camden, NY
- (3) WATERTOWN [USC00309000], Watertown, NY
- (4) OLD FORGE [USC00306184], Eagle Bay, NY

Influencing water features

Soil features

Table 4. Representative soil features

Parent material	(1) Glaciofluvial deposits (2) Till–sedimentary rock (3) Till–shale and siltstone (4) Till–sandstone and siltstone
Surface texture	(1) Loam (2) Cobbly, gravelly loam (3) Loam (4) Loam
Drainage class	Very poorly drained to poorly drained
Permeability class	Very slow to moderately slow
Soil depth	13–72 in
Surface fragment cover <=3"	0%
Surface fragment cover >3"	0–9%
Available water capacity (2-6in)	Not specified

Soil reaction (1:1 water) (3.5-8.4in)	Not specified
Subsurface fragment volume <=3" (6-36in)	Not specified
Subsurface fragment volume >3" (1-60in)	Not specified

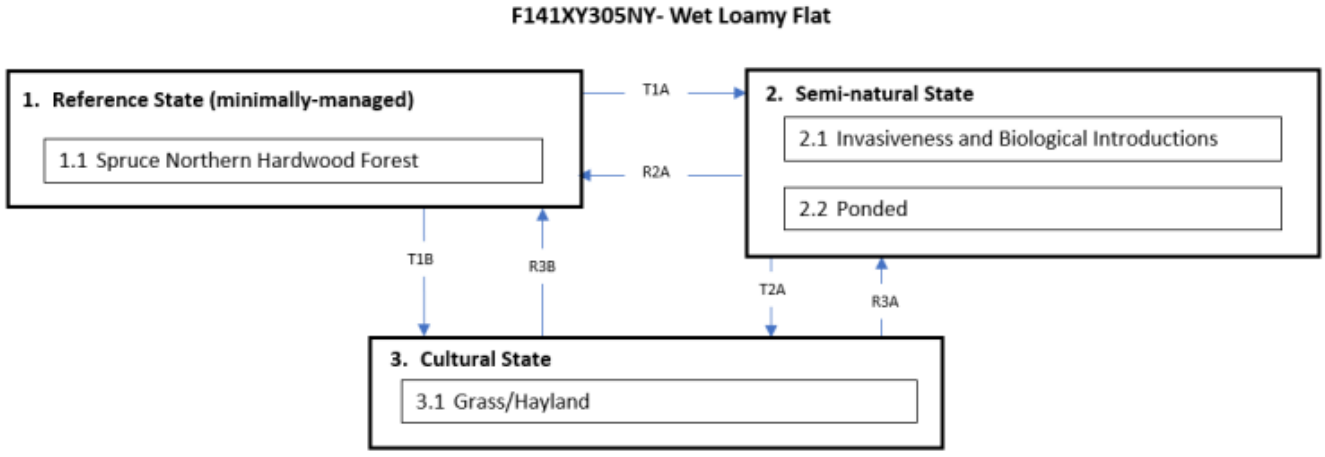
Ecological dynamics

[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 2003) and localized associations provided by the New York Natural Heritage Program (Edinger et al. 2014).

This site is dominated by red spruce, sometimes mixed with black spruce, and a sphagnum moss 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.

State and transition model



Transition	*Drivers/practices*
T1A	climate change, hydrological alteration, significant increase in flooding events and annual precipitation, introduction of invasive species, pests, and pathogens
R2A	remediation of hydrologic alteration, management of invasive species, pests, and pathogens, restoration of key native plant species, restoration of terrestrial and aquatic habitat
T1B, T2A	hydrologic alteration (barrier, obstruction, dam, diversion), landscape alteration, mechanical soil disturbance, landscape alteration, planting, seeding
R3A, R3B	remediation of hydrologic alteration, seeding, planting, significant flooding events and increase in annual precipitation, compacted soil, establishment of key native plant species

State 1
Reference State (minimally-managed)

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 varying textures and 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 Seepage Bottoms (Cedar), is not usually ponded, and does not include a major component of very poorly-drained soils. Black spruce and red spruce are abundant, with larch common and balsam fir occurring in younger patches. Cinnamon fern and other herbs are often abundant in the understory.

Resilience management. This site is dominated by red spruce, sometimes mixed with black spruce, and a sphagnum moss 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. Blowdowns with subsequent gap regeneration are the most frequent form of natural disturbance, with large-scale fires important at longer return intervals.

Dominant resource concerns

- Ponding and flooding
- Plant productivity and health
- Plant structure and composition
- Plant pest pressure
- Wildfire hazard from biomass accumulation
- Terrestrial habitat for wildlife and invertebrates
- Aquatic habitat for fish and other organisms

Community 1.1
Spruce - Northern Hardwood Forest

A mixed forest that occurs on lower mountain slopes and upper margins of flats on glacial till. This is a broadly defined community with several regional and edaphic variants; it is one of the most common forest types in the Adirondacks. Codominant trees are red spruce (*Picea rubens*), sugar maple (*Acer saccharum*), American beech (*Fagus grandifolia*), yellow birch (*Betula alleghaniensis*), and red maple (*Acer rubrum*), with scattered balsam fir (*Abies balsamea*). Striped maple (*Acer pensylvanicum*) and mountain maple (*A. spicatum*) are common subcanopy trees. Characteristic shrubs are hobblebush (*Viburnum lantanoides*), American fly honeysuckle (*Lonicera canadensis*), and Canada yew (*Taxus canadensis*). Characteristic groundlayer plants are common wood-sorrel (*Oxalis montana*), common wood fern (*Dryopteris intermedia*), shining fir clubmoss (*Huperzia lucidula*), wild sarsaparilla (*Aralia nudicaulis*), blue bead-lily (*Clintonia borealis*), goldthread (*Coptis trifolia*), bunchberry (*Cornus canadensis*), Canada mayflower (*Maianthemum canadense*), Indian cucumber-root (*Medeola virginiana*), and twisted stalk (Streptopus roseus). (Edinger et al. 2014)

Resilience management. New York Natural Heritage Program State Rank: S3/S4 S3- Typically 21 to 100 occurrences, limited acreage, or miles of stream in New York State. S4- Apparently secure in New York State. Gaps formed by wind, snow, ice, and harvesting are the major replacement agents; fires may be important but only over a long return interval. (Edinger et al. 2014)

Dominant resource concerns

- Ponding and flooding
- Plant productivity and health
- Plant structure and composition
- Plant pest pressure
- Wildfire hazard from biomass accumulation
- Terrestrial habitat for wildlife and invertebrates

State 2
Semi-natural State

Shifts in ecological site composition, functionality, and dynamics driven by natural disturbances, processes, and pressures (may have some anthropogenic drivers). More research is needed to determine the extent of the Semi-natural state associated with this ecological site.

Dominant resource concerns

- Ponding and flooding
- Plant productivity and health
- Plant structure and composition
- Plant pest pressure
- Terrestrial habitat for wildlife and invertebrates

Community 2.1
Invasiveness and Biological Introductions

Introduction of invasive species, pathogens, and/or pests resulting in shifts in ecological site composition, functionality, and dynamics. More research is needed to determine the extent of these effects on the semi-natural state associated with this ecological site.

Community 2.2
Ponded

Site may transition to a ponded environment under certain ecological conditions or constraints such as increased annual/decadal precipitation or significant increase in flooding events.

Dominant resource concerns

- Ponding and flooding
- Plant productivity and health
- Plant structure and composition
- Plant pest pressure
- Terrestrial habitat for wildlife and invertebrates

State 3
Cultural State

Community 3.1
Grass/Hayland

Site transitioned to grassland for pasture or grazing or cultivated for hay production.

Dominant resource concerns

- Plant productivity and health
- Plant structure and composition

Transition T1A
State 1 to 2

climate change, hydrological alteration, significant increase in flooding events and annual precipitation, introduction of invasive species, pests, and pathogens

Conservation practices

Monitoring and Evaluation

Transition T1B
State 1 to 3

hydrologic alteration (barrier, obstruction, dam, diversion), landscape alteration, mechanical soil disturbance, landscape alteration, planting, seeding

Conservation practices

Cover Crop
Land Clearing
Precision Land Forming
Irrigation Land Leveling
Land Smoothing
Spoil Spreading
Grazing Management Plan
Grazing management to improve wildlife habitat
Harvest hay in a manner that allows wildlife to flush and escape
Monitoring and Evaluation

Restoration pathway R2A
State 2 to 1

remediation of hydrologic alteration, management of invasive species, pests, and pathogens, restoration of key native plant species, restoration of terrestrial and aquatic habitat

Conservation practices

Restoration and Management of Rare and Declining Habitats
Upland Wildlife Habitat Management
Invasive Plant Species Control
Pathogen Management
Invasive Species Pest Management
Restoration and Management of Rare or Declining Habitats
Multi-species Native Perennials for Biomass/Wildlife Habitat
Habitat Development for Beneficial Insects for Pest Management
Biological suppression and other non-chemical techniques to manage brush, weeds and invasive species
Biological suppression and other non-chemical techniques to manage herbaceous weeds invasive species
Monitoring and Evaluation
Herbaceous Weed Control

Transition T2A
State 2 to 3

hydrologic alteration (barrier, obstruction, dam, diversion), landscape alteration, mechanical soil disturbance, landscape alteration, planting, seeding

Conservation practices

Cover Crop
Land Clearing
Precision Land Forming
Irrigation Land Leveling
Land Smoothing
Spoil Spreading

Monitoring and Evaluation

Restoration pathway R3B
State 3 to 1

remediation of hydrologic alteration, seeding, planting, significant flooding events and increase in annual precipitation, compacted soil, establishment of key native plant species

Conservation practices

Restoration and Management of Rare and Declining Habitats
Upland Wildlife Habitat Management
Restoration and Management of Natural Ecosystems
Native Plant Community Restoration and Management
Monitoring and Evaluation

Restoration pathway R3A
State 3 to 2

remediation of hydrologic alteration, seeding, planting, significant flooding events and increase in annual precipitation, compacted soil, establishment of key native plant species

Conservation practices

Restoration and Management of Rare and Declining Habitats
Upland Wildlife Habitat Management
Restoration and Management of Natural Ecosystems
Native Plant Community Restoration and Management
Monitoring and Evaluation

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).

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

Greg Schmidt, 10/03/2024

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	05/11/2025
Approved by	Greg Schmidt
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:**
