USDA Natural Resources Conservation Service

Ecological site F144BY505ME
Loamy over Sandy

Last updated: 9/27/2024
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): 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 Part

Ecological site concept

This site occurs on various landforms where soils are stratified, with finer textures underlain by sandy textures. This site concept requires further consideration, but seems to usually support conifer and/or hardwood species, notably hemlock, red maple, and beech.

This site includes the following state natural heritage program types:
• Hemlock-spruce-northern hardwoods forest (Sperduto and Nichols 2004)
• Spruce-Northern Hardwoods Forest (Gawler and Cutko 2010)
• Hemlock-spruce-northern hardwoods forest (Thompson and Sorenson 2000)

Similar sites

F144BY502ME	**Loamy Till Toeslope** The Loamy Till Toeslope site produces similar species, but is poorly- to somewhat poorly-drained with loamy textures and dense loamy subsoil, whereas the Loamy Over Sandy site is moderately well- to well-drained with sandy subsoil.
F144BY601ME	**Dry Sand** The Dry Sand site does not have a loamy cap and is well- to excessively-drained, whereas the Loamy Over Sandy site is moderately well- to well-drained and supports more hardwood production.
F144BY602ME	**Sandy Toeslope** The Sandy Flat site does not have a loamy cap and is somewhat poorly- to moderately well-drained, whereas the Loamy over Sandy site is moderately well- to well-drained.

Table 1. Dominant plant species

Tree	(1) *Tsuga canadensis* (2) *Picea rubens*
Shrub	Not specified
Herbaceous	Not specified

Physiographic features

This site occurs on landforms where sandy deposits are overlain by loamy surface layers, including glaciofluvial outwash and moraines. It occurs on gentle to very steep slopes (usually less than 35% but sometimes up to 60% slope), and from sea level to 3000 feet in elevation.

Table 2. Representative physiographic features

Landforms	(1) Outwash plain > Terrace (2) River valley > Outwash terrace (3) Upland > Hill (4) Upland > Mountain (5) Upland > Ground moraine (6) Upland > Valley side (7) Upland > Moraine (8) Valley > Outwash plain (9) Valley > Terrace (10) Lake terrace
Runoff class	Very low to high
Flooding frequency	None
Ponding frequency	None
Elevation	10–2,755 ft
Slope	0–35%
Water table depth	0–72 in
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)	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

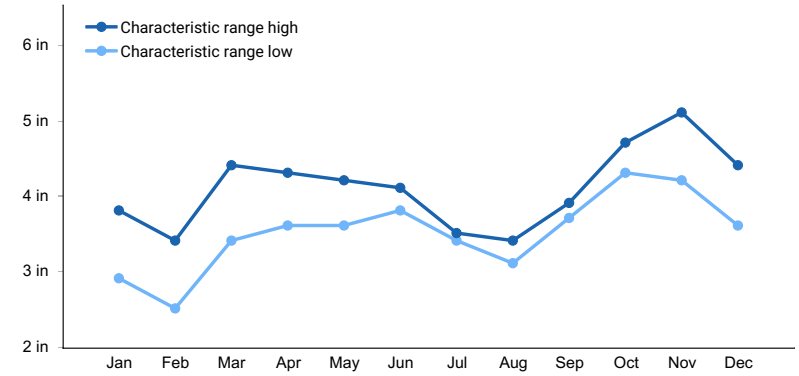

Figure 1. Monthly precipitation range

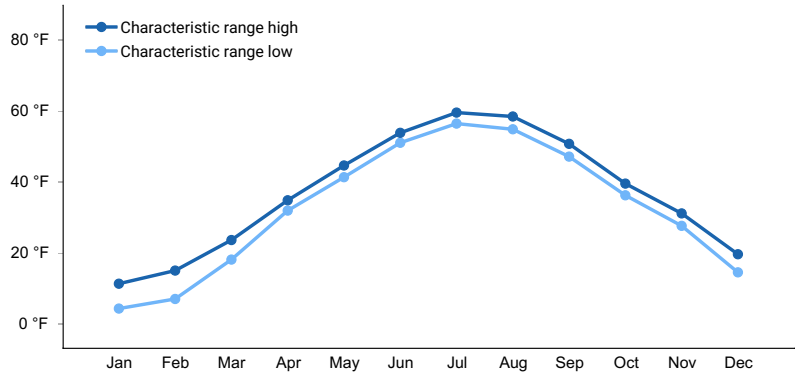

Figure 2. Monthly minimum temperature range

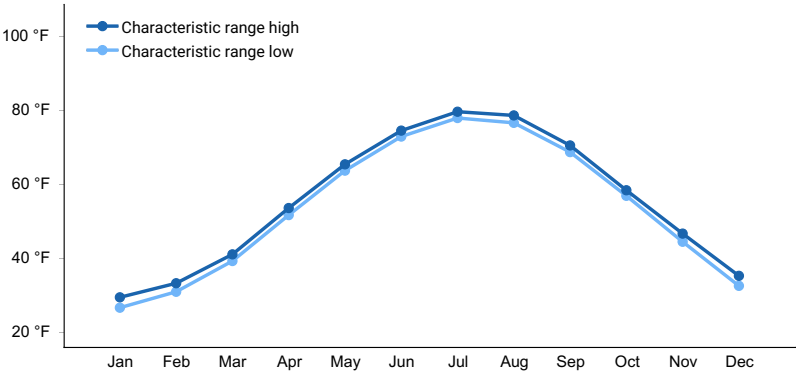

Figure 3. Monthly maximum temperature range

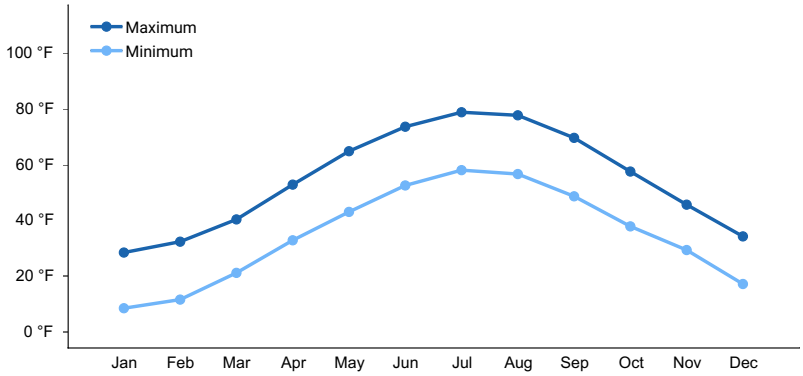

Figure 4. Monthly average minimum and maximum temperature

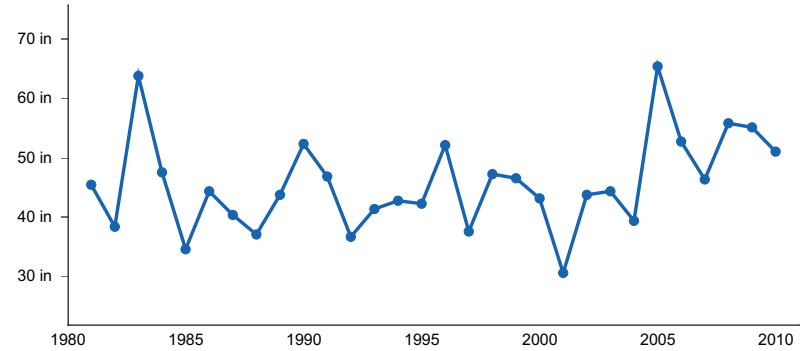

Figure 5. Annual precipitation pattern

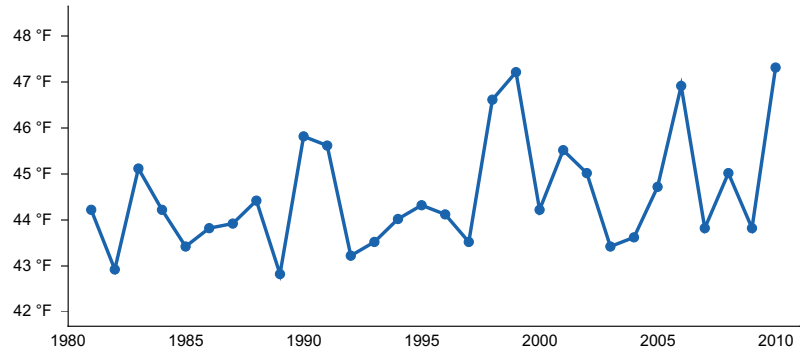

Figure 6. Annual average temperature pattern

Climate stations used

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

Influencing water features

This site is not typically influenced by streams or wetlands.

Soil features

The soils of this site formed in ablation till and/or glaciofluvial outwash. These are moderately well- and well-drained sandy soils with a loamy surface. Rock fragments may or may not be abundant on the soil surface and throughout the profile.

Representative soils are Hero, Hero variant, Ninigret, Allagash, Monadnock, Chichester, Groveton, Madawaska, Charlton, Duxbury, Machias, Irasburg, and Salmon.

Table 4. Representative soil features

Parent material	(1) Ablation till–igneous and metamorphic rock (2) Glaciofluvial deposits–igneous and metamorphic rock (3) Outwash–granite and gneiss (4) Eolian deposits–limestone (5) Lodgment till–granite and gneiss (6) Glaciolacustrine deposits (7) Supraglacial meltout till
Surface texture	(1) Fine sandy loam (2) Stony fine sandy loam (3) Gravelly loam (4) Loam (5) Loam (6) Silt loam (7) Loamy coarse sand
Drainage class	Moderately well drained to well drained
Soil depth	20 in
Surface fragment cover <=3"	0%
Surface fragment cover >3"	0–2%
Available water capacity (Depth not specified)	2.8–6.4 in
Soil reaction (1:1 water) (Depth not specified)	3.6–6
Subsurface fragment volume <=3" (Depth not specified)	2–20%
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, 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 produces mixedwood forests, particularly with hemlock, red spruce, white pine, red maple, beech, pin cherry and yellow birch.

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. The young forest stands include several species not typically dominant in the reference community, including grey and white birch, aspen, balsam fir, etc. After about 80-100 years these species die out and the reference community species retain dominance.

This site may be cultivated for crop or pasture. When cropland or pastureland management ceases, the site either returns to mixedwood forest 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.

Further study is required to understand the long-term dynamics of the white pine state, as well as the existence of a sand/gravel mining state on this site.

This site includes the following state natural heritage program types:
• Hemlock-spruce-northern hardwoods forest (Sperduto and Nichols 2004)
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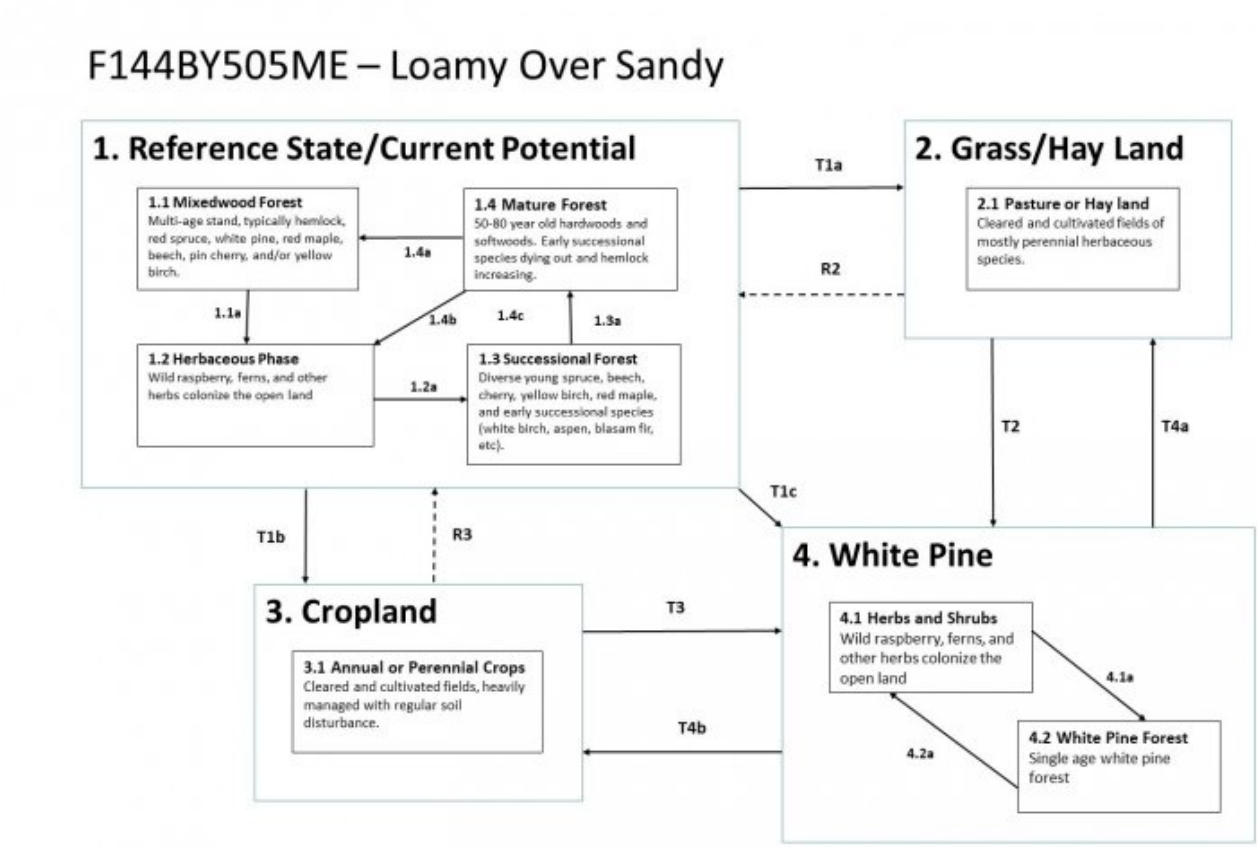
State and transition model



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

windtrhrow, 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
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
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

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

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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:

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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:**
