USDA Natural Resources
Conservation Service

Ecological site F140XY011NY
Rich Organic Wetlands

Last updated: 10/01/2024
Accessed: 05/21/2025

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): 140X–Glaciated Allegheny Plateau and Catskill Mountains

This area is primarily in the Southern New York Section of the Appalachian Plateaus Province of the Appalachian Highlands. The top of the dissected plateau in this MLRA is broad and is nearly level to moderately sloping. The narrow valleys have steep walls and smooth floors. The Catskills in the east have steep slopes. Elevation is typically 650 to 1,000 feet on valley floors; 1,650 to 2,000 feet on the plateau surface; and 3,600 feet or more in parts of the Catskills.

The average annual precipitation in most of this area is 30 to 45 inches. Rainfall occurs as high-intensity, convective thunderstorms during the summer, but most of the precipitation in this area occurs as snow. The average annual temperature is 40 to 50 degrees F.

The dominant soil order in this MLRA is Inceptisols. The soils in the area dominantly have a mesic soil temperature regime, an aquic or udic soil moisture regime, and mixed mineralogy. Frigid soils are found within the higher elevations.

This area supports forest vegetation, particularly hardwood species. Beech-birch-maple and elm-ash-red maple are the potential forest types. The extent of oak species increases from east to west, particularly in areas of shallow and dry soils. In some areas conifers, such as white pine, are important. Aspen, hemlock, northern white-cedar, and black ash grow on the wetter soils. In some parts of the area, sugar maple has potential economic significance. Some of the major wildlife species in this area are white-tailed deer, cottontail, turkey, pheasant, and grouse.

Classification relationships

USDA NRCS:
LRR: R - Northeastern Forage and Forest Region
MLRA 140 - Glaciated Allegheny Plateau and Catskills Mountains

EPA Ecoregions:
Level III: 60 - Northern Allegheny Plateau and 58 - Northeastern Highlands
Level IV: 60a - Glaciated Low Allegheny Plateau, 60b - Delaware-Neversink Highlands, 60c - Catskills Transition, and 58y - Catskill High Peaks

USDA USFS:
200 Humid Temperate Domain
212 Laurentian Mixed Forest Province
M212 Adirondack - New England Mixed Forest - Coniferous Forest - Alpine Meadow Province

NY Natural Heritage Program Plant Community Classification:
Rich Hemlock-Hardwood Peat Swamp
Red Maple-Tamarack Peat Swamp

International Vegetation Classification Associations:
Red Maple - Black Ash - (Eastern Hemlock) / Heartleaf Foamflower Swamp Forest (CEGL006502)
Red Maple - Black Ash - (Tamarack) / Alderleaf Buckthorn Swamp Forest (CEGL006009)

NatureServe Ecological Systems
North-Central Interior and Appalachian Rich Swamp (CES202.605)

Ecological site concept

Landform/Landscape Position:
The site occurs in depressions on till plains, lake plains, outwash plains, and flood plains. Slopes range from 0 to 2 percent.

Soils:
The soils consists of very deep, very poorly drained soils formed in highly decomposed woody and herbaceous organic materials. Soil temperature regime is mesic. Soil components include Catden and Natchaug.

Vegetation:
Reference community is a mixed conifer-hardwood peat swamp. Characteristic vegetation includes:

Trees: hemlock (*Tsuga canadensis*), red maple ((*Acer rubrum*), yellow birch (*Betula*

alleghaniensis), and black ash (*Fraxinus nigra*), white pine (*Pinus strobus*), tamarack (*Larix laricina*), black gum (*Nyssa sylvatica*), and Atlantic white cedar (*Chamaecyparis thyoides*).

Shrubs: highbush blueberry (*Vaccinium corymbosum*), speckled alder (*Alnus incana* ssp. rugosa), winterberry (*Ilex verticillata*), witch-hazel (*Hamamelis virginiana*), and bog laurel (*Kalmia polifolia*).

Herbaceous: cinnamon fern (*Osmunda cinnamomea*) and sensitive fern (*Onoclea sensibilis*), foam flower (*Tiarella cordifolia*), skunk-cabbage (*Symplocarpus foetidus*), and tussock sedge (*Carex stricta*).

Nonvascular: Sphagnum spp.

Associated sites

F140XY012PA	**Organic Wetlands**
F140XY013PA	**High Floodplain**

Similar sites

F140XY001NY	**Frigid Till Depressions**

Table 1. Dominant plant species

Tree	(1) *Tsuga canadensis* (2) *Acer rubrum*
Shrub	(1) *Vaccinium corymbosum* (2) *Alnus incana ssp. rugosa*
Herbaceous	(1) *Osmunda cinnamomea* (2) *Symplocarpus foetidus*

Physiographic features

The site occurs in depressions on till plains, lake plains, outwash plains, and valleys. Slopes range from 0 to 2 percent.

Table 2. Representative physiographic features

Landforms	(1) Till plain > Depression (2) Outwash plain > Depression (3) Lake plain > Depression (4) Valley > Depression (5) Flood plain (6) Kettle (7) Marsh (8) Swamp
Runoff class	Negligible to low
Flooding frequency	None to frequent
Ponding frequency	None to frequent
Elevation	76–1,158 m
Slope	0–2%
Water table depth	0–69 cm
Aspect	Aspect is not a significant factor

Climatic features

The Koppen-Geiger climate classification of the area in which this MLRA occurs is Dfb, Warm-summer humid continental. Rainfall occurs as high-intensity, convective thunderstorms in the summer. However, snow comprises most of the precipitation in this area. The frost-free-free period in this area averages 165 days and ranges from 130 to 200 days, with the coldest temperatures and the shortest frost-free periods occurring in the high-elevation areas in the eastern part of the MLRA.

Table 3. Representative climatic features

Frost-free period (characteristic range)	90-109 days
Freeze-free period (characteristic range)	124-143 days
Precipitation total (characteristic range)	965-1,295 mm
Frost-free period (actual range)	89-110 days
Freeze-free period (actual range)	118-144 days
Precipitation total (actual range)	965-1,524 mm
Frost-free period (average)	98 days
Freeze-free period (average)	132 days
Precipitation total (average)	1,168 mm

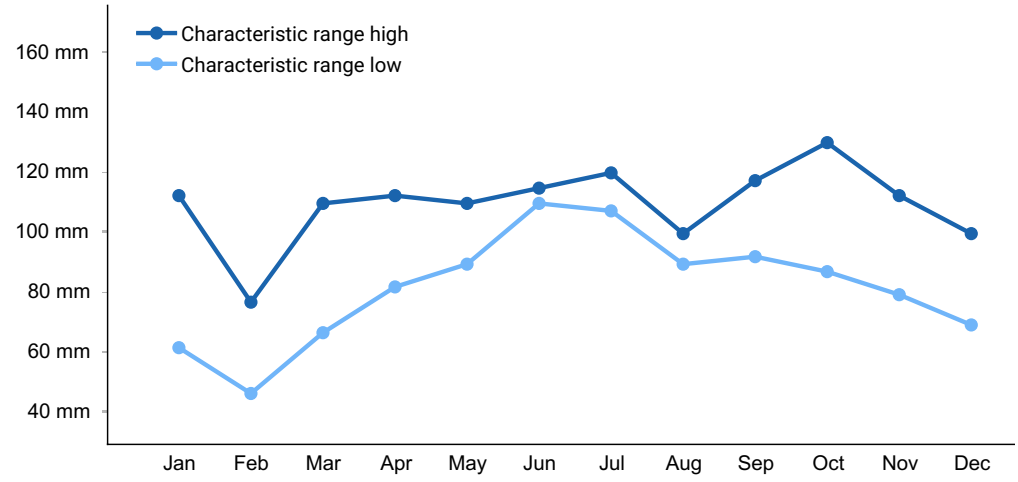


Figure 1. Monthly precipitation range

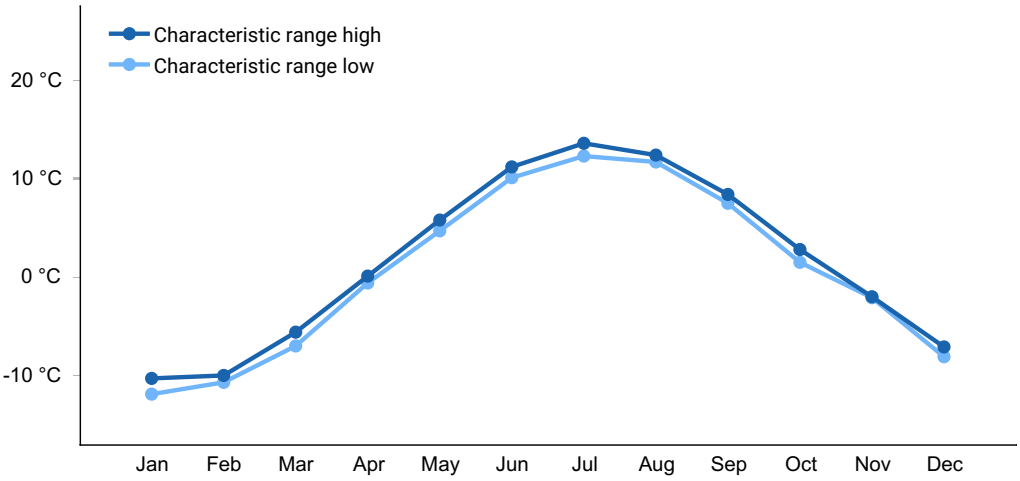


Figure 2. Monthly minimum temperature range

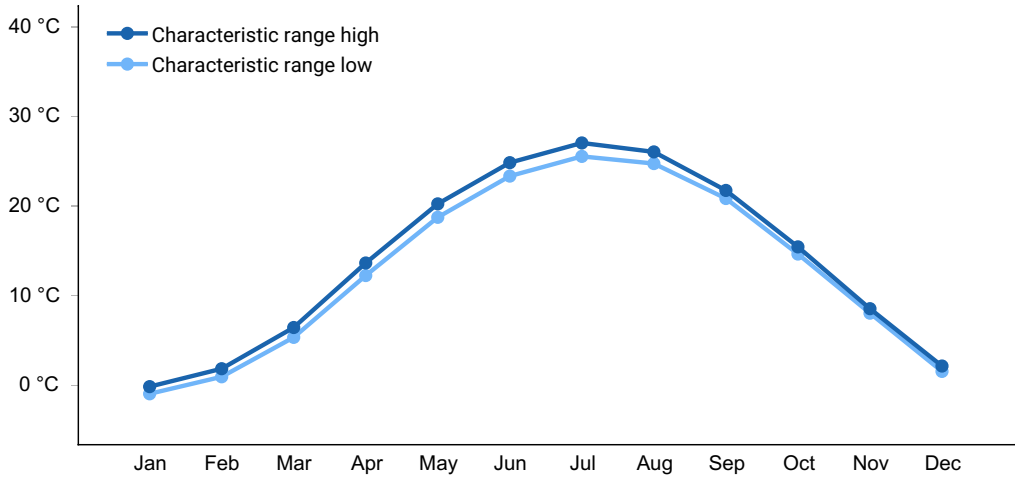


Figure 3. Monthly maximum temperature range

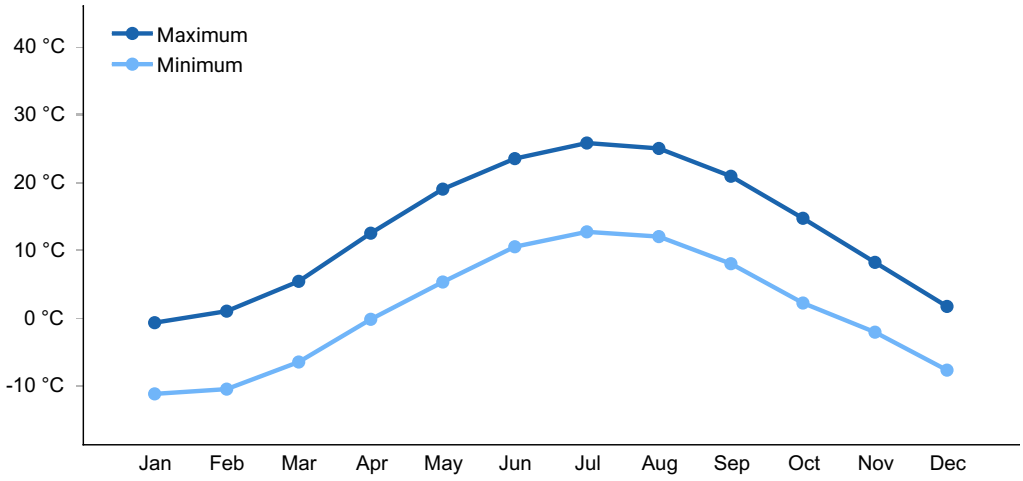


Figure 4. Monthly average minimum and maximum temperature

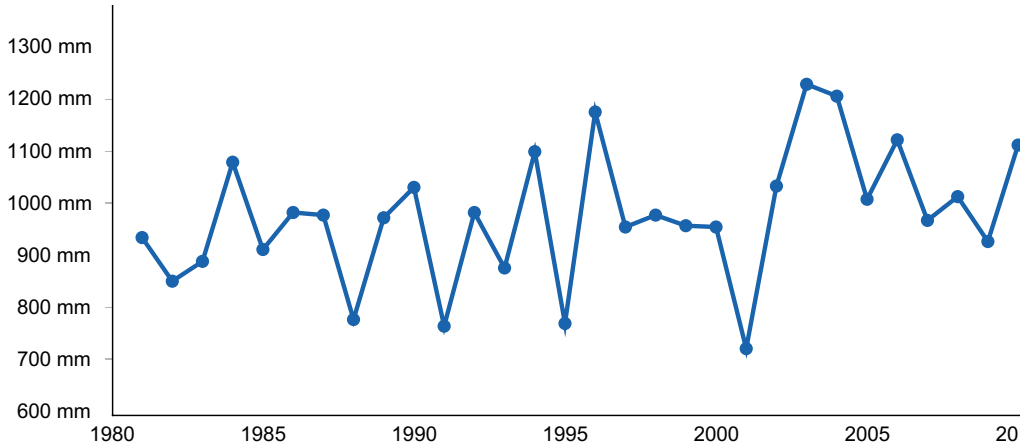


Figure 5. Annual precipitation pattern

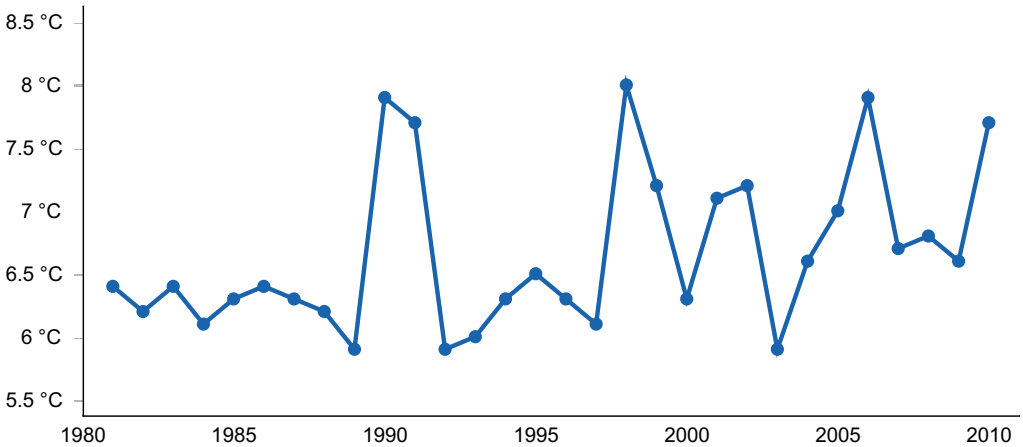


Figure 6. Annual average temperature pattern

Climate stations used

- (1) ROCK HILL 3 SW [USC00307210], Rock Hill, NY
- (2) HAWLEY 1 E [USC00363758], Hawley, PA
- (3) ELMIRA [USC00302610], Elmira, NY
- (4) WILKES-BARRE INTL AP [USW00014777], Pittston, PA

- (5) ITHACA CORNELL UNIV [USC00304174], Ithaca, NY
- (6) COLDEN 1 N [USC00301623], Colden, NY
- (7) LAPORTE [USC00364815], Muncy Valley, PA

Influencing water features

Very poorly drained
Water is removed from the soil so slowly that free water remains at or very near the surface during much of the growing season. Internal free water occurrence is very shallow and persistent or permanent. Unless the soil is artificially drained, most mesophytic crops cannot be grown. The soils are commonly level or depressed and frequently ponded. In areas where rainfall is high or nearly continuous, slope gradients may be greater.

Wetland description

National Wetland Classification (Cowardin et al., 1979):

Palustrine, class variable, leaf morphology variable, water regime variable, chemistry modifier variable.

Soil features

The soils consists of very deep, very poorly drained soils formed in highly decomposed woody and herbaceous organic materials. Soil temperature regime is mesic. Soil components include Carbondale, Carlisle, Catden, Natchaug, Palms, Pawling, Peat (fibrists And Hemists), and Philo.

Table 4. Representative soil features

Parent material	(1) Alluvium–sandstone and siltstone (2) Organic material
Surface texture	(1) Mucky (2) Loam (3) Silt loam
Family particle size	(1) Coarse-loamy (2) Loamy (3) Coarse-loamy over sandy or sandy-skeletal
Drainage class	Very poorly drained to moderately well drained
Permeability class	Slow to moderately slow
Depth to restrictive layer	97–183 cm
Surface fragment cover <=3"	0%
Surface fragment cover >3"	0%

Available water capacity (Depth not specified)	12.7–43.18 cm
Soil reaction (1:1 water) (Depth not specified)	3–8.4
Subsurface fragment volume <=3" (Depth not specified)	0–49%
Subsurface fragment volume >3" (Depth not specified)	0–5%

Ecological dynamics

Reference community is a mixed conifer-hardwood peat swamp. Characteristic vegetation includes:

Trees: hemlock (*Tsuga canadensis*), red maple ((*Acer rubrum*), yellow birch (*Betula alleghaniensis*), and black ash (*Fraxinus nigra*), white pine (*Pinus strobus*), tamarack (*Larix laricina*), black gum (*Nyssa sylvatica*), and Atlantic white cedar (*Chamaecyparis thyoides*).

Shrubs: highbush blueberry (*Vaccinium corymbosum*), speckled alder (*Alnus incana* ssp. rugosa), winterberry (*Ilex verticillata*), witch-hazel (*Hamamelis virginiana*), and bog laurel (*Kalmia polifolia*).

Herbaceous: cinnamon fern (*Osmunda cinnamomea*) and sensitive fern (*Onoclea sensibilis*), foam flower (*Tiarella cordifolia*), skunk-cabbage (*Symplocarpus foetidus*), and tussock sedge (*Carex stricta*).

Nonvascular: Sphagnum spp.

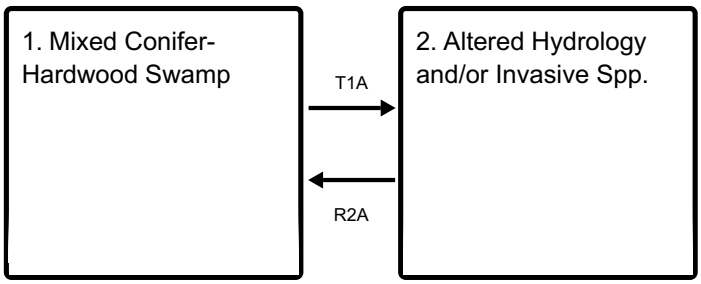
Dynamics/Threats From New York Natural Heritage Program:

Rich hemlock-hardwood peat swamps are threatened by development (e.g., agriculture, residential), habitat alteration (e.g., excessive logging, sediment and pollution run-off), and recreational overuse (e.g., hiking trails, horse trails, ATVs, campgrounds). Alteration to the natural hydrological regime is also a threat to this community (e.g., impoundments, blocked culverts, beaver). A few swamps are threatened by over-browsing by deer. Several rich hemlock-hardwood peat swamps are threatened by invasive species, such as purple loosestrife (*Lythrum salicaria*). Hemlock woolly adelgid (Adelges tsugae) is an exotic species that could potentially have a devastating effect on hemlock trees in New York. This exotic "sap-sucker" has only recently begun to spread through the forests of the northeastern United States. Without control measures, insect-infected trees will probably die within three to four years (McClure et al. 2001, Bishop 2002, Ward et al. 2004). Although current adelgid infestations are primarily confined to southeastern New York, in 2002 adelgid infestation was newly observed in Monroe County (USDA Forest Service

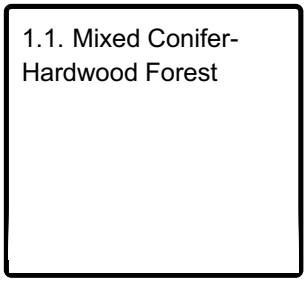
2002).

State and transition model

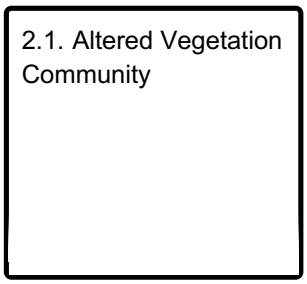
Ecosystem states



State 1 submodel, plant communities



State 2 submodel, plant communities



State 1
Mixed Conifer-Hardwood Swamp

Reference community is a mixed conifer-hardwood peat swamp.

Community 1.1
Mixed Conifer-Hardwood Forest

State 2
Altered Hydrology and/or Invasive Spp.

Altered hydrology has impacted site conditions and species composition. Hemlock woolly adelgid (Adelges tsugae) is an exotic species that could potentially have a devastating effect on hemlock trees. Several rich hemlock-hardwood peat swamps are threatened by invasive species, such as purple loosestrife (*Lythrum salicaria*) (NYNHP 2019).

Community 2.1
Altered Vegetation Community

Transition T1A
State 1 to 2

Changes to hydrology (impoundments, blocked culverts, diversions, irrigation ditches, etc)

Restoration pathway R2A
State 2 to 1

Conservation practices

Restoration and Management of Natural Ecosystems

Additional community tables

Inventory data references

Site Development and Testing Plan:
Future work to validate the vegetation information in this provisional ecological site description is needed. This will include field activities to collect low and medium intensity sampling and analysis of that data. Field reviews should be done by soil scientists and vegetation specialists. A final field review, peer review, quality control, and quality assurance reviews of the ESD will be needed to produce the final approved level document. Reviews of the project plan are to be conducted by the Ecological Site Technical Team.

Other references

New York Natural Heritage Program. 2019. Online Conservation Guide for Rich hemlock-hardwood peat swamp. Available from: https://guides.nynhp.org/rich-hemlock-hardwood-peat-swamp/. Accessed September 27, 2019.

Contributors

Joshua Hibit

Approval

Greg Schmidt, 10/01/2024

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	05/20/2020
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):**

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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):**

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:**