USDA Natural Resources
Conservation Service

Ecological site F140XY020NY
Dense Outwash

Last updated: 10/01/2024
Accessed: 05/20/2025

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

NY Natural Heritage Program Plant Community Classification:
Allegheny Oak Forest

PA Natural Heritage Program Plant Community Classification:
Red oak - mixed hardwood forest

International Vegetation Classification Associations:
Black Oak, White Oak) / Blue Ridge Blueberry / Western Brackenfern Allegheny Plateau-Northeast Forest (CEGL006018)

Ecological site concept

Landform/Landscape Position:
The site occurs on outwash terraces, benches, and morains. Slopes range from 0 to 25 percent.

Soils:
The soils consists of very deep, moderately well drained and somewhat poorly drained, gravelly, coarse-loamy soils that formed in glacial outwash deposits. Depth to the fragipan ranges from 15 to 30 inches. Representative soils are Braceville and Rexford (somewhat poorly drained phase).

Vegetation:
The reference community is mixed hardwood forest characterized by red oak, yellow birch, red maple, hickories, American beech, white pine, hop-hornbeam, spicebush, serviceberry, southern arrowwood, sessile-leaved bellwort, and false Solomon's seal.

Associated sites

F140XY016NY	**Mineral Wetlands**

Similar sites

F140XY022NY	**Moist Outwash**

Table 1. Dominant plant species

Tree	(1) *Quercus rubra* (2) *Carya tomentosa*

Shrub	(1) *Viburnum recognitum* (2) *Amelanchier laevis*
Herbaceous	(1) *Uvularia sessilifolia* (2) *Maianthemum racemosum ssp. racemosum*

Physiographic features

The site occurs on outwash terraces, benches, and moraines. Slopes range from 0 to 25 percent.

Table 2. Representative physiographic features

Landforms	(1) Delta (2) Drainageway (3) Outwash plain (4) Outwash terrace (5) Terrace
Runoff class	Negligible to very high
Flooding frequency	None to rare
Ponding frequency	None
Elevation	164–1,968 ft
Slope	0–15%
Water table depth	6–27 in
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. Mean annual precipitation is 43 inches and evenly distributed throughout the year. Rainfall occurs as high-intensity, convective thunderstorms in the summer. However, snow comprises most of the precipitation in this area. Average frost-free and freeze-free days are 122 and 153, respectively, 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)	110-134 days
Freeze-free period (characteristic range)	136-168 days
Precipitation total (characteristic range)	38-49 in
Frost-free period (actual range)	101-136 days

Freeze-free period (actual range)	136-168 days
Precipitation total (actual range)	36-51 in
Frost-free period (average)	122 days
Freeze-free period (average)	154 days
Precipitation total (average)	43 in

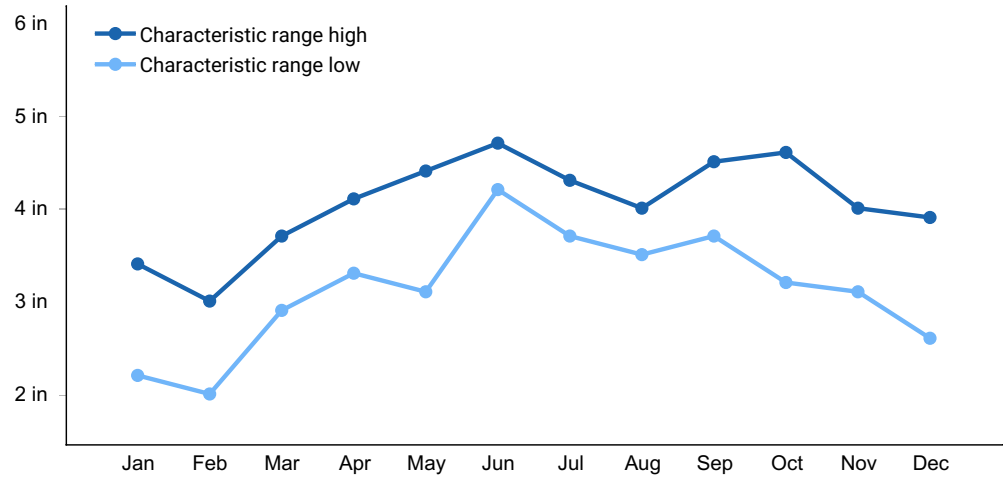


Figure 1. Monthly precipitation range

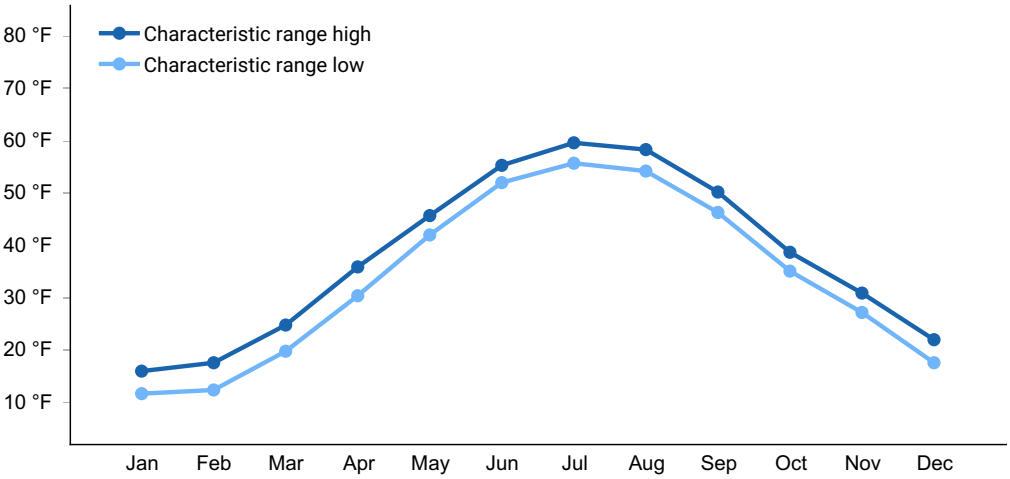


Figure 2. Monthly minimum temperature range

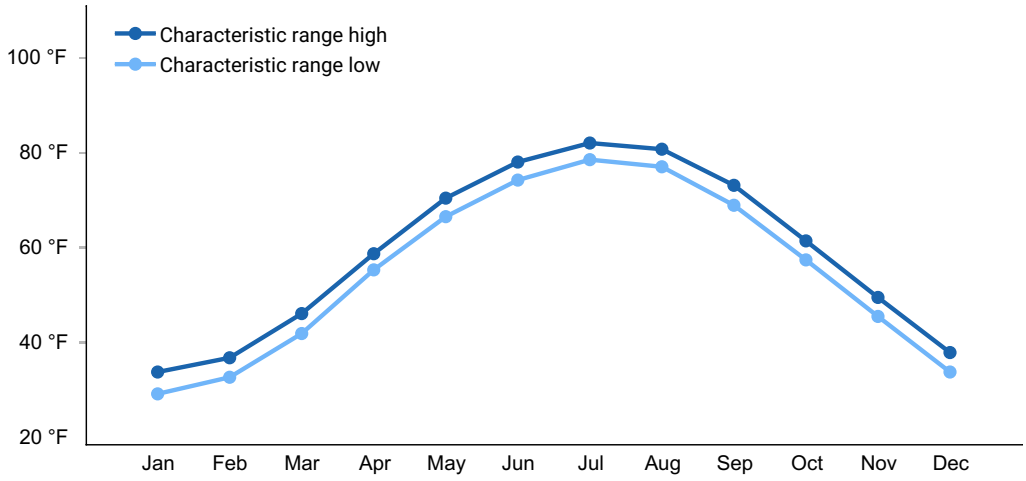


Figure 3. Monthly maximum temperature range

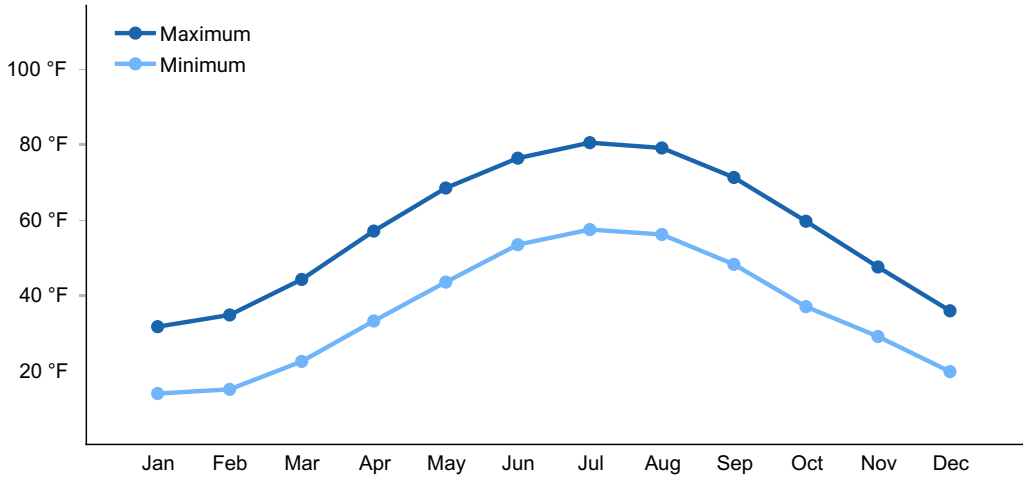


Figure 4. Monthly average minimum and maximum temperature

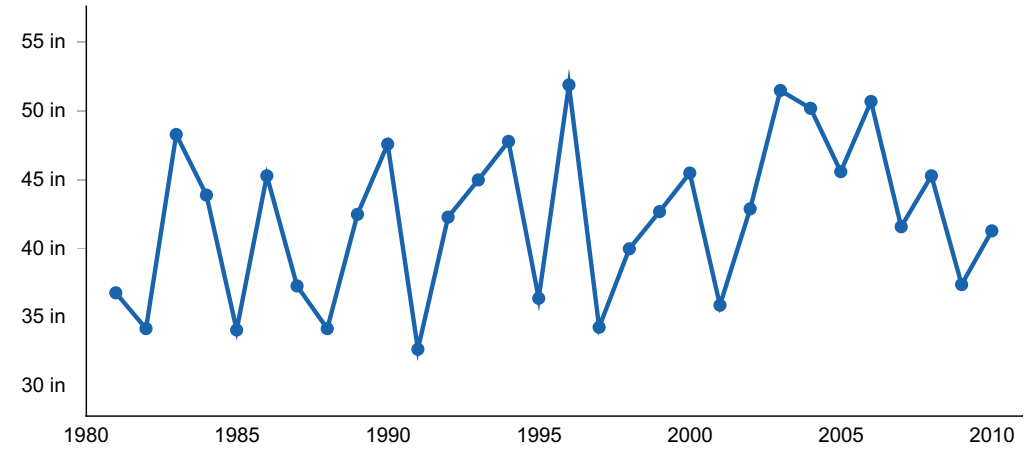


Figure 5. Annual precipitation pattern

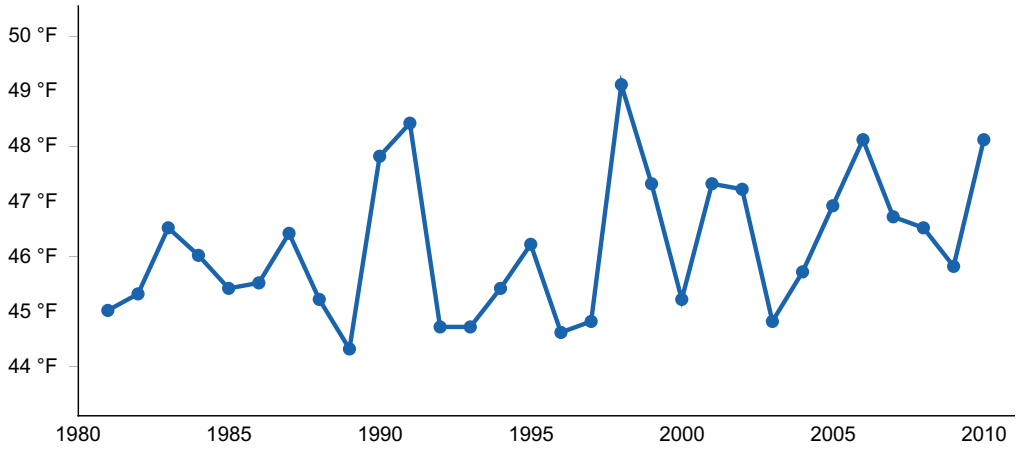


Figure 6. Annual average temperature pattern

Climate stations used

- (1) BINGHAMTON [USW00004725], Johnson City, NY
- (2) STROUDSBURG [USC00368596], East Stroudsburg, PA
- (3) TOWANDA 1 S [USC00368905], Towanda, PA
- (4) MONTROSE [USC00365915], Montrose, PA
- (5) CORNING [USC00301787], Corning, NY
- (6) ROCK HILL 3 SW [USC00307210], Rock Hill, NY
- (7) CANTON [USC00361212], Canton, PA

Influencing water features

NONE

Wetland description

NONE

Soil features

The soils consists of very deep, moderately well drained and somewhat poorly drained, gravelly, coarse-loamy soils that formed in glacial outwash deposits. Depth to the fragipan (root restricting layer) ranges from 15 to 30 inches. Representative soils are Braceville and Rexford (somewhat poorly drained phase).

Table 4. Representative soil features

Parent material	(1) Glaciofluvial deposits–sandstone and shale (2) Outwash–siltstone (3) Sedimentary rock

Surface texture	(1) Gravelly loam (2) Fine sandy loam (3) Silt loam (4) Gravelly silt loam (5) Loam
Family particle size	(1) Coarse-loamy
Drainage class	Somewhat poorly drained to moderately well drained
Permeability class	Very slow
Depth to restrictive layer	18–30 in
Surface fragment cover <=3"	0%
Surface fragment cover >3"	0%
Available water capacity (Depth not specified)	2–4 in
Soil reaction (1:1 water) (Depth not specified)	4.5–6.5
Subsurface fragment volume <=3" (Depth not specified)	7–30%
Subsurface fragment volume >3" (Depth not specified)	2–7%

Ecological dynamics

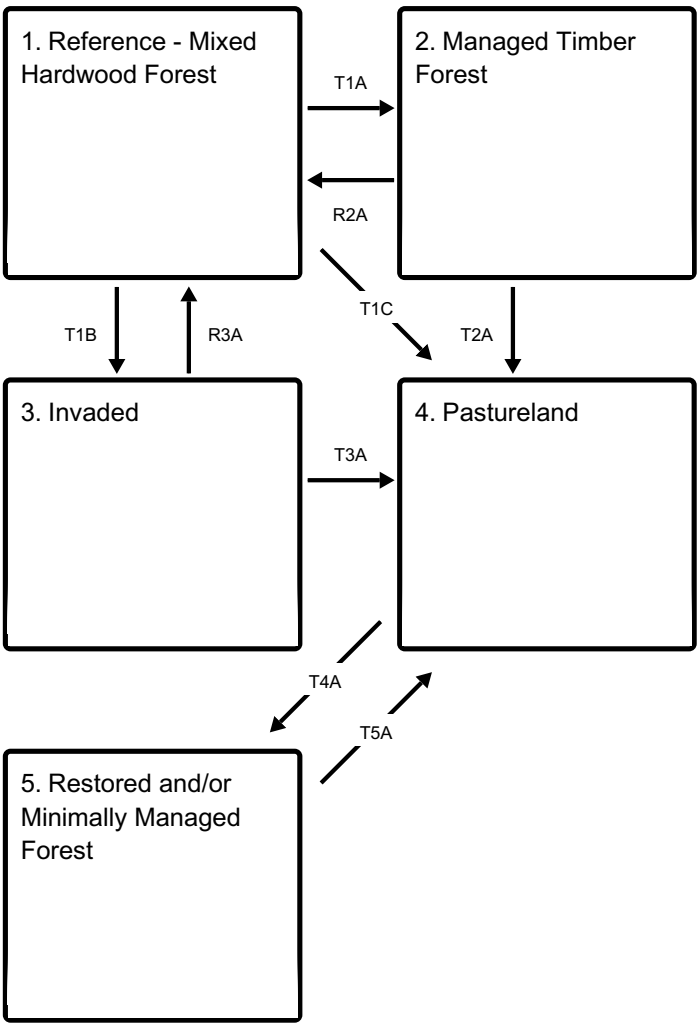
The reference community is mixed hardwood forest characterized by red oak, yellow birch, red maple, hickories, American beech, white pine, hop-hornbeam, spicebush, serviceberry, southern arrowwood, sessile-leaved bellwort, and false Solomon's seal.

Disturbance such as windthrow and logging favor *Quercus velutina* and *Betula lenta*.

(NatureServe element code CEGL006018)

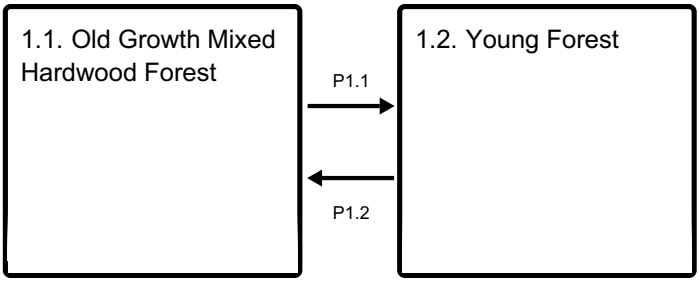
State and transition model

Ecosystem states

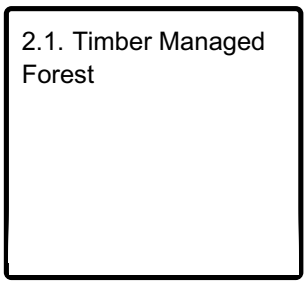


States 2 and 5 (additional transitions)

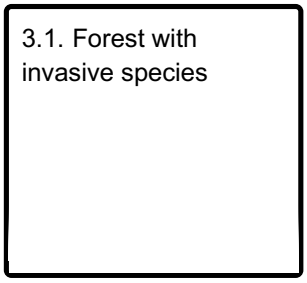
State 1 submodel, plant communities



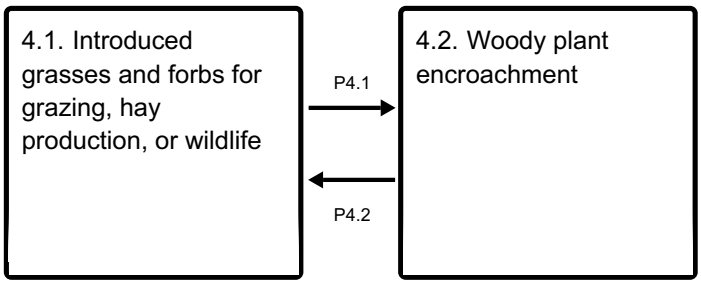
State 2 submodel, plant communities



State 3 submodel, plant communities



State 4 submodel, plant communities



State 1
Reference - Mixed Hardwood Forest

The reference community is mixed hardwood forest characterized by red oak, yellow birch, red maple, hickories, American beech, white pine, hop-hornbeam, spicebush, serviceberry, southern arrowwood, sessile-leaved bellwort, and false Solomon's seal.

Characteristics and indicators. Site was not cleared or cultivated historically.

Community 1.1
Old Growth Mixed Hardwood Forest

Mature closed canopy forest.

Dominant plant species

- northern red oak (*Quercus rubra*), tree
- white oak (*Quercus alba*), tree
- American beech (*Fagus grandifolia*), tree
- sugar maple (*Acer saccharum*), tree
- mockernut hickory (*Carya tomentosa*), tree

Community 1.2
Young Forest

Pathway P1.1
Community 1.1 to 1.2

Wind, ice storm,, insect damage.

Pathway P1.2
Community 1.2 to 1.1

Time; succession

State 2
Managed Timber Forest

Removal of trees of commercial value. Invasive species may be present.

Community 2.1
Timber Managed Forest

Forest managed for timber, primarily oak species. Depending on type of management birch, beech, and maple may dominate following commercial timber harvest.

State 3
Invaded

Invasive species abundant. Minimally managed forest.

Community 3.1
Forest with invasive species

Non-native and invasive species present (Japanese barberry, multiflora rose, bush honeysuckle, stiltgrass.

State 4
Pastureland

Site converted to pasture for livestock grazing or hay production.

Resilience management. Must be managed (grazed, mowed, etc.) to maintain pastureland.

Community 4.1
Introduced grasses and forbs for grazing, hay production, or wildlife

Community 4.2
Woody plant encroachment

Pathway P4.1
Community 4.1 to 4.2

Lack of management (mowing, grazing, prescribed fire)

Pathway P4.2
Community 4.2 to 4.1

Mowing, brush management, prescribed fire.

Conservation practices

Brush Management
Prescribed Burning

State 5
Restored and/or Minimally Managed Forest

Restored forest or second-growth forest.

Characteristics and indicators. Site was cleared and/or cultivated historically.

Transition T1A
State 1 to 2

Timber harvest.

Transition T1B
State 1 to 3

Establishment of invasive species.

Transition T1C
State 1 to 4

Land use conversion.

Conservation practices

Land Clearing

Restoration pathway R2A
State 2 to 1

Conservation practices

Forest Stand Improvement
Forest Land Management
Prescribed Forestry
Forest Management Plan - Written
Forest Management Plan - Applied
Forest stand improvement for habitat and soil quality

Transition T2A
State 2 to 4

Land use conversion

Conservation practices

Land Clearing

Restoration pathway R2B
State 2 to 5

Restoration pathway R3A
State 3 to 1

Invasive species management/removal.

Conservation practices

Invasive Plant Species Control
Invasive Species 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

Transition T3A
State 3 to 4

Restoration pathway T4A
State 4 to 5

Transition T5A
State 5 to 4

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

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.

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):**

   _____

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:**
