

Ecological site F140XY027NY

Well Drained Till Uplands

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

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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

Ecological site concept

Landform/Landscape Position:
The site occurs on till plains, hills, hillslopes, ridges, drumlinoid ridges benches, valley sides, and ground moraines. Representative slope ranges from 5 to 60 percent.

Soils:
The soils consists of moderately deep to very deep, well drained coarse loamy soils that formed in glacial till derived mostly from sandstone, siltstone, and shale. Correlated soils are Cadosia, Chadakoin, Cheshire, Lordstown, Madrid, Manlius, Maplecrest, Oquaga, and Valois.

Vegetation:
The reference plant community is an oak dominated forest (Red oak - mixed hardwood forest - PA Natural Heritage Program) . Red oak is often a dominant tree species but other species can co-occur such as black oak, white oak, and various species of hickories (mockernut and shagbark). Other associated trees include American beech, sugar maple, and eastern white pine. Common shrubs include mapleleaf viburnum and lowbush blueberry. Common herbaceous plants include Pennsylvania sedge, wild oats, eastern teaberry and western brackenfern.

Associated sites

| | |
|-------------|-----------------------------|
| F140XY026PA | Dry Till Uplands |
| F140XY023NY | Shallow Till Uplands |

Similar sites

| | |
|-------------|---|
| F140XY005NY | Frigid Steep Well Drained Dense Till |
| F140XY006NY | Frigid Well Drained Dense Till |

Table 1. Dominant plant species

| | |
|------|--|
| Tree | (1) <i>Quercus rubra</i> (2) <i>Carya tomentosa</i> |
|------|--|

| | |
|------------|---|
| Shrub | (1) <i>Viburnum acerifolium</i> (2) <i>Vaccinium angustifolium</i> |
| Herbaceous | (1) <i>Carex pensylvanica</i> (2) <i>Pteridium aquilinum</i> |

Physiographic features

The site occurs on till plains, hills, hillslopes, ridges, drumlinoid ridges benches, valley sides, and ground moraines. Representative slope ranges from 5 to 60 percent.

Table 2. Representative physiographic features

| | |
|--------------------|--|
| Landforms | (1) Mountains > Till plain (2) Till plain > Hill (3) Upland > Hillside (4) Valley > Ridge (5) Drumlinoid ridge (6) Valley side (7) Bench (8) Hillside or mountainside (9) End moraine (10) Lateral moraine (11) Ground moraine |
| Runoff class | Low to very high |
| Flooding frequency | None |
| Ponding frequency | None |
| Elevation | 50–762 m |
| Slope | 0–90% |
| Water table depth | 61–183 cm |
| Aspect | Aspect is not a significant factor |

Table 3. Representative physiographic features (actual ranges)

| | |
|--------------------|---------------|
| Runoff class | Not specified |
| Flooding frequency | Not specified |
| Ponding frequency | Not specified |
| Elevation | Not specified |
| Slope | 0–90% |
| Water table depth | Not specified |

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 4. Representative climatic features

| | |
|--|--------------|
| Frost-free period (characteristic range) | 110-134 days |
| Freeze-free period (characteristic range) | 136-168 days |
| Precipitation total (characteristic range) | 965-1,245 mm |
| Frost-free period (actual range) | 101-136 days |
| Freeze-free period (actual range) | 136-168 days |
| Precipitation total (actual range) | 914-1,295 mm |
| Frost-free period (average) | 122 days |
| Freeze-free period (average) | 154 days |
| Precipitation total (average) | 1,092 mm |

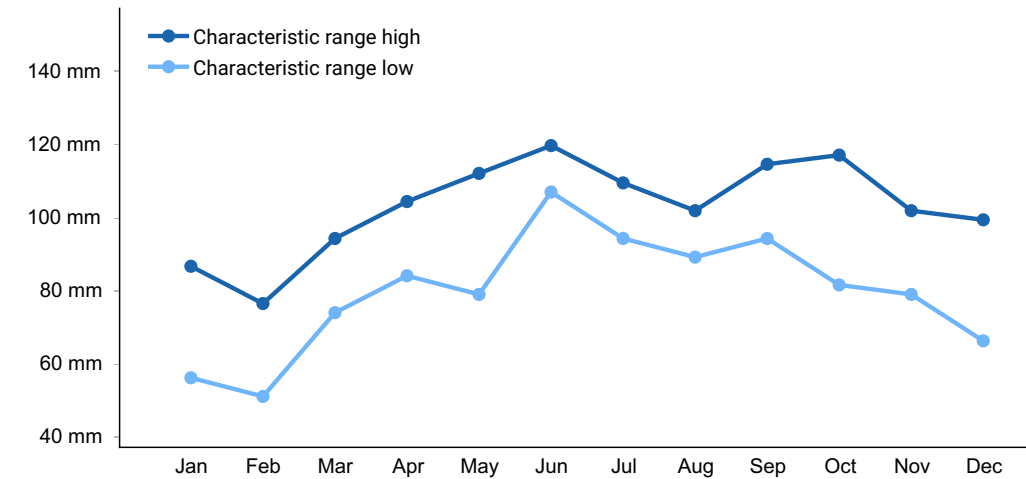


Figure 1. Monthly precipitation range

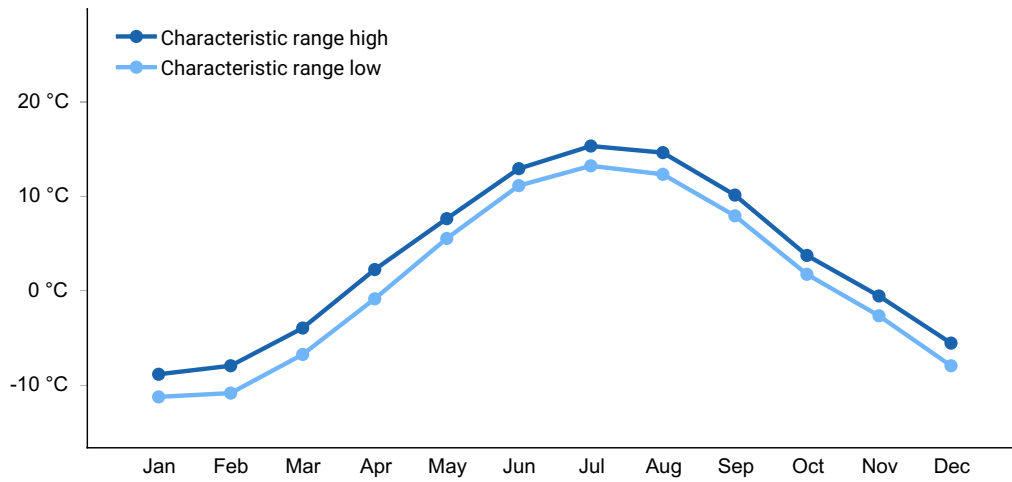


Figure 2. Monthly minimum temperature range

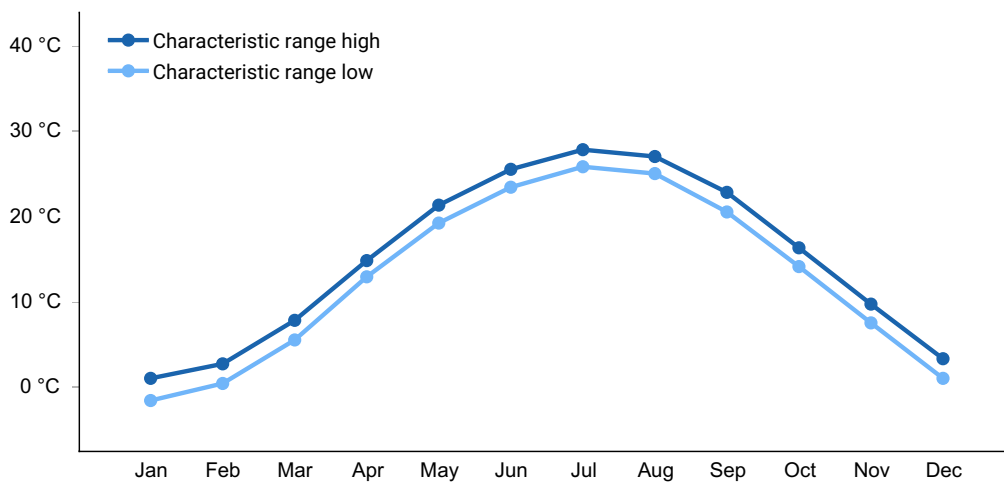


Figure 3. Monthly maximum temperature range

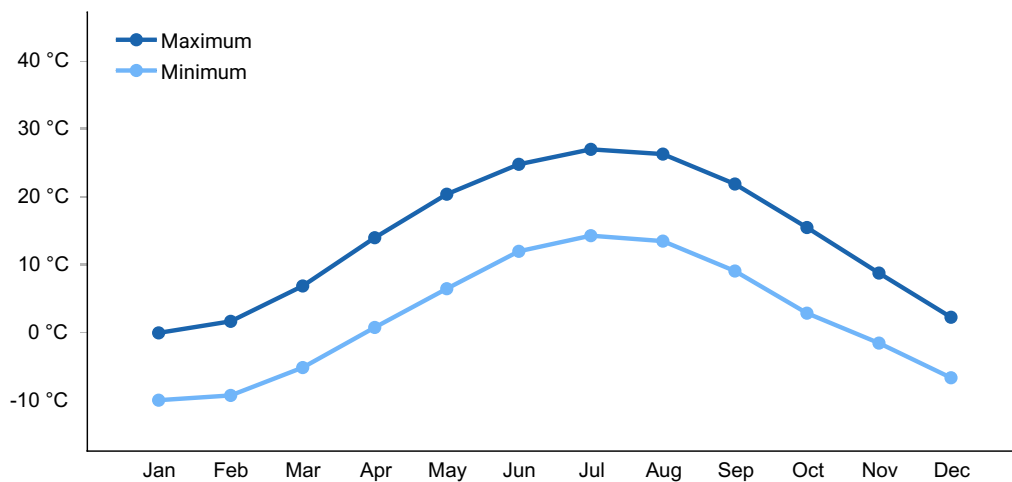


Figure 4. Monthly average minimum and maximum temperature

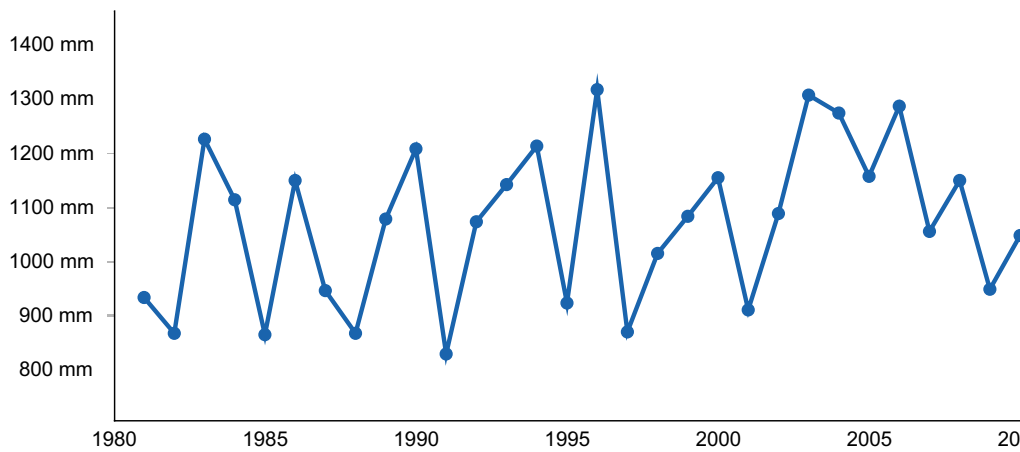


Figure 5. Annual precipitation pattern

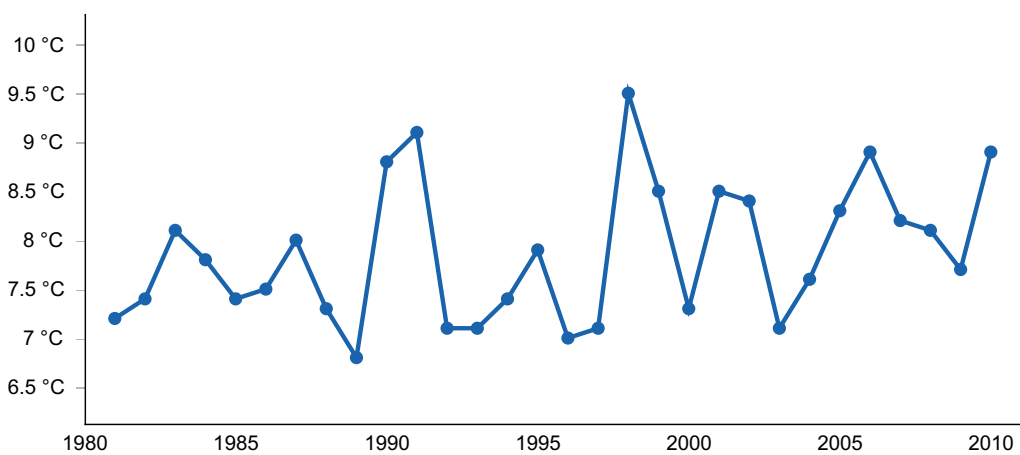


Figure 6. Annual average temperature pattern

Climate stations used

- (1) 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 moderately deep to very deep, well drained coarse loamy soils that formed in glacial till derived mostly from sandstone, siltstone, and shale. Correlated soils are Cadosia, Chadakoin, Cheshire, Lansing, Lordstown, Madrid, Manlius, Maplecrest, Oquaga, Penargyl, Valois, and Weikert.

Table 5. Representative soil features

| | |
|--|---|
| Parent material | (1) Till–sandstone (2) Till–shale and siltstone (3) Colluvium–limestone (4) Residuum–conglomerate (5) Sedimentary rock |
| Surface texture | (1) Loam (2) Fine sandy loam (3) Channery silt loam (4) Channery loam (5) Extremely channery loam (6) Gravelly loam (7) Flaggy silt loam (8) Very channery loam (9) Very channery silt loam (10) Gravelly silt loam (11) Extremely stony loam (12) Extremely stony silt loam (13) Very stony silt loam (14) Flaggy loam (15) Stony silt loam (16) Gravelly sandy loam (17) Very fine sandy loam |
| Family particle size | (1) Coarse-loamy (2) Loamy-skeletal (3) Fine-loamy |
| Drainage class | Well drained |
| Permeability class | Very slow to rapid |
| Depth to restrictive layer | 38–183 cm |
| Surface fragment cover ≤3" | 0% |
| Surface fragment cover >3" | 0–60% |
| Available water capacity (Depth not specified) | 2.54–17.78 cm |
| Soil reaction (1:1 water) (Depth not specified) | 3.5–8.4 |

| | |
|--|--------|
| Subsurface fragment volume <=3" (Depth not specified) | 10–42% |
| Subsurface fragment volume >3" (Depth not specified) | 0–85% |

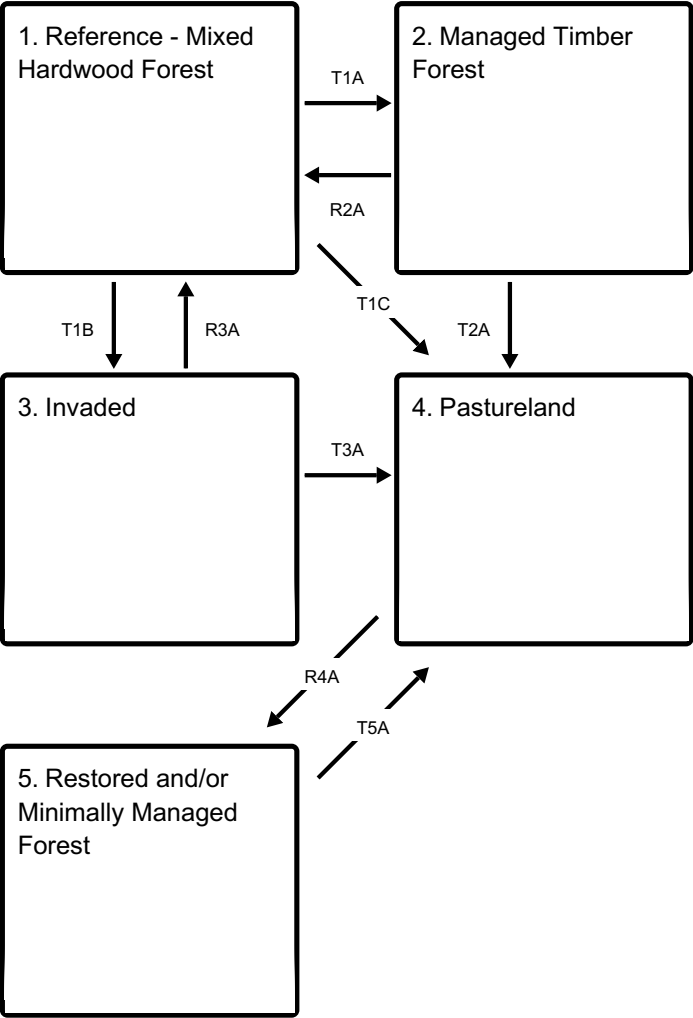
Ecological dynamics

The reference plant community is an oak dominated forest (Red oak - mixed hardwood forest - PA Natural Heritage Program) . Red oak is often a dominant tree species but other species can co-occur such as black oak, white oak, and various species of hickories (mockernut and shagbark). Other associated trees include American beech, sugar maple, and eastern white pine. Common shrubs include mapleleaf viburnum and lowbush blueberry. Common herbaceous plants include Pennsylvania sedge, wild oats, eastern teaberry and western brackenfern.

In openings following tree falls or other natural disturbances warm season grasses such as little bluestem and big bluestem may occur along with early successional trees such as eastern red cedar and black birch. Invasive exotic plants such as Japanese barberry, multiflora rose, winged euonymus, and shrub honeysuckles can occur in disturbed sites.

State and transition model

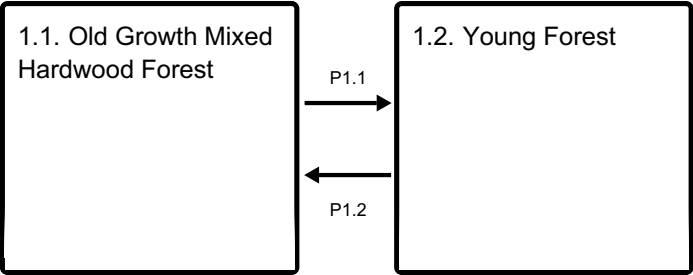
Ecosystem states



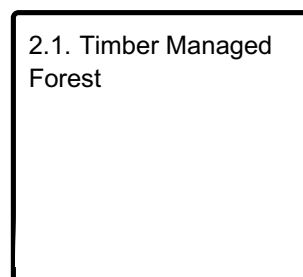
States 2 and 5 (additional transitions)



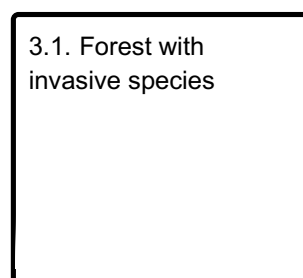
State 1 submodel, plant communities



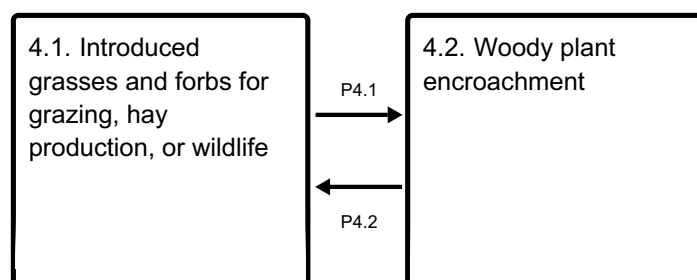
State 2 submodel, plant communities



State 3 submodel, plant communities



State 4 submodel, plant communities



State 1

Reference - Mixed Hardwood Forest

The reference plant community is an oak dominated forest (Red oak - mixed hardwood forest - PA Natural Heritage Program) . Red oak is often a dominant tree species but other species can co-occur such as black oak, white oak, and various species of hickories (mockernut and shagbark). Other associated trees include American beech, sugar maple, and eastern white pine. Common shrubs include mapleleaf viburnum and lowbush blueberry. Common herbaceous plants include Pennsylvania sedge, wild oats, eastern teaberry and western brackenfern.

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

- shagbark hickory (*Carya ovata*), tree

- sedge (*Carex*), grass
- white ash (*Fraxinus americana*), other herbaceous

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

Ecological restoration.

Conservation practices

| |
|--------------------------|
| Forest Stand Improvement |
|--------------------------|

| |
|------------------------|
| Forest Land Management |
|------------------------|

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 |
|--------------------------------|

Transition T3A State 3 to 4

Land use conversion.

Restoration pathway R4A State 4 to 5

Ecological restoration.

Transition T5A
State 5 to 4

Land use conversion.

Additional community tables

Table 6. Community 1.1 forest overstory composition

| Common Name | Symbol | Scientific Name | Nativity | Height (M) | Canopy Cover (%) | Diameter (Cm) | Basal Area (Square M/Hectare) |
|-------------|--------|-----------------|----------|------------|------------------|---------------|-------------------------------|
| | | | | | | | |

Table 7. Community 1.1 forest understory composition

| Common Name | Symbol | Scientific Name | Nativity | Height (M) | Canopy Cover (%) |
|-------------|--------|-----------------|----------|------------|------------------|
| | | | | | |

Table 8. Community 2.1 forest overstory composition

| Common Name | Symbol | Scientific Name | Nativity | Height (M) | Canopy Cover (%) | Diameter (Cm) | Basal Area (Square M/Hectare) |
|-------------|--------|-----------------|----------|------------|------------------|---------------|-------------------------------|
| | | | | | | | |

Table 9. Community 2.1 forest understory composition

| Common Name | Symbol | Scientific Name | Nativity | Height (M) | Canopy Cover (%) |
|-------------|--------|-----------------|----------|------------|------------------|
| | | | | | |

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

Edinger, G.J., Evans, D.J., Gebauer, S., Howard, T.G., Hunt, D.M., and A.M. Olivero, A.M. (eds.). 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.

Zimmerman, E., T. Davis, G. Podniesinski, M. Furedi, J. McPherson, S. Seymour, B. Eichelberger, N. Dewar, J. Wagner, and J. Fike (editors). 2012. Terrestrial and Palustrine Plant Communities of Pennsylvania, 2nd Edition. Pennsylvania Natural Heritage Program, Pennsylvania Department of Conservation and Natural Resources, Harrisburg, Pennsylvania.

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):**
-
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:**
-