

Ecological site F127XY011WV Frigid High Elevation Uplands

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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): 127X–Eastern Allegheny Plateau and Mountains

This ecosite is found in mountains, plateau in MLRA 127: Eastern Allegheny Plateau and Mountains. This site occupies the Allegheny Mountain Section of the Appalachian Highlands of the Appalachian Plateau Province. The deeply dissected plateau in this area terminates in a high escarpment, the Allegheny Front, in the eastern part of the area. Steep slopes are dominant, but level to gently rolling plateau remnants are conspicuous in the northern part of the area. The area is dominantly forest, containing large blocks of state forest, game lands, and national forest. Less than one-tenth of the MLRA consists of urban areas.

Classification relationships

This site crosswalks to Landfire biophysical setting (BpS)Central and Southern Appalachian Spruce-Fir Forest

NatureServe (2007) describes this as Central and Southern Appalachian Spruce-Fir Forest CES202.028 Component Associations

Association Unique ID Association Name

CEGL006029 *Picea rubens* - *Tsuga canadensis* - *Fagus grandifolia* / *Dryopteris intermedia* Forest

CEGL006152 *Picea rubens* - (*Tsuga canadensis*) / *Rhododendron maximum* Forest

CEGL008501 *Picea rubens* / *Betula alleghaniensis* / *Bazzania trilobata* Forest

Ecological site concept

This site contains predominately Spodosols and Inceptisols located on high elevation (mean elevation > 973m) uplands that are frigid (MAAT <= 45 degrees F).

From Landfire <http://www.landfire.gov/index.php>:

This system consists of forests in the highest elevation zone of the Southern Blue Ridge and parts of the central Appalachians. Generally occurring on all topographic positions above 1676m (5500ft), up to the highest peaks, but can be found as low as 975m(3200ft) at the northern range in West Virginia (NatureServe 2007). Occurs in the Central Appalachian Broadleaf-Coniferous and Forest Meadow ecological provinces, and the Northern Ridge and Valley and Blue Ridge Mountain ecological sections (others also likely). Generally, site conditions are poor, with short frost-free seasons.

Soils are highly variable, ranging from deep mineral soils to well-developed boulder fields. Soils may be saturated for long periods from a combination of precipitation and seepage. Any kind of bedrock may be present, but most sites have erosion-resistant felsic igneous or metamorphic rocks (NatureServe 2007). Toward the southern end of the range, soils are most often rocky and acidic, with low base saturation; toward the northern end, sites tend to be characterized by shallow, poorly developed, easily eroded soils on steep slopes. A thick organic soil layer is frequently present.

Overall hydrology is mesic, ranging from wet in bogs, seeps, and the most protected sites to dry-mesic on some exposed upper slopes and ridges. Mesic conditions and generally a cool, wet climate are maintained by high annual rainfall, frequent fog deposition, low temperatures, and heavy shading. This type would have dominated the landscape throughout with inclusions of other forest types in wetter spots, or at higher elevations.

Table 1. Dominant plant species

Tree	Not specified
Shrub	Not specified
Herbaceous	Not specified

Physiographic features

Climatic features

Influencing water features

Soil features

Ecological dynamics

Information contained in this section was adapted from several sources. The information presented is representative of very complex vegetation communities. Key indicator plants, animals and ecological processes are described to help inform land management decisions. Plant communities will differ across the MLRA because of the naturally occurring variability in weather, soils, and aspect. The reference plant community is not necessarily the management goal. The species lists are representative and are not botanical descriptions of all species occurring, or potentially occurring, on this site. They are not intended to cover every situation or the full range of conditions, species, and responses for the site.

From Landfire <http://www.landfire.gov/index.php>:

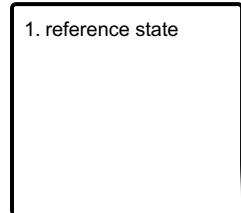
Vegetation consists primarily of forests dominated by *Picea rubens*, *Abies fraseri*, or *Abies balsamea*, occasionally by *Sorbus americana*. *Betula alleghaniensis*, *Tsuga canadensis*, and *Quercus rubra* are the only other locally common canopy species (NatureServe 2007).

This system produces stable, uneven-aged forest in various combinations of dense evergreen, broadleaf, and mixed forest with canopy dynamics dominated by gap-phase regeneration on a fine scale. The highest elevations support nearly pure expanses of Fraser fir (*Abies fraseri*) and/or red spruce (*Picea rubens*); balsam fir (*Abies balsamea*) replaces Fraser fir in VA and West VA north of Mount Rogers. Associated species in these upper elevations include yellow birch (*Betula alleghaniensis*), mountain ash (*Sorbus americana*), pin cherry (*Prunus pensylvanica*), mountain maple (*Acer spicatum*), hobble bush (*Viburnum alnifolium*), and bearberry (*Vaccinium erythrocarpum*). American beech (*Fagus grandifolia*) may occur in pure stands at a small scale. With decreasing elevations, typical northern hardwood species (*B. alleghaniensis*, *F. grandifolia*, and *Aesculus flava*) mix with *P. rubens*. As *P. rubens* drops out, various combinations of *B. alleghaniensis*, *F. grandifolia*, *A. flava*, *Acer saccharum*, and *Quercus rubra* dominate. Eastern hemlock (*Tsuga canadensis*) may be locally important.

A well-developed deciduous shrub layer is common, and a dense evergreen shrub layer (or shrub-dominated community - "heath balds") can develop on more exposed sites. A few associations have dense shrub layers of *Rhododendron catawbiense*, *Rhododendron maximum*, or *Vaccinium erythrocarpum*. The lower strata is often dense, and diversity may be high with many Southern Appalachian endemics; dominated by mosses, ferns, or forbs.

State and transition model

Ecosystem states



State 1

reference state

BpS Dominant and Indicator Species Symbol Scientific Name Common Name PIRU *Picea rubens* Red spruce BEAL2 *Betula alleghaniensis* Yellow birch ABFR *Abies fraseri* Fraser fir ABBA *Abies balsamea* Balsam fir FAGR *Fagus grandifolia* American beech TSCA *Tsuga canadensis* Eastern hemlock ACSA3 *Acer saccharum* Sugar maple QURU *Quercus rubra* Northern red oak Disturbance Description This setting is characterized by stable, uneven aged forests with canopy dynamics driven primarily by single or multiple tree disturbances resulting in gap-phase regeneration. Natural disturbances include lightning fire, debris avalanches, wind events, and ice storms. Occasional extreme wind events disturb larger patches on the most exposed slopes. Strong winds, extreme cold, rime ice, and other extreme weather are periodically important (NatureServe 2007). Weather disturbances, including windthrow, insect attack (especially bark beetle, spruce budworm, fungi), and ice storms, occur at intervals of 100 to 200yrs and are the primary disturbances. Rare extreme weather events are also important large-scale disturbances. Insect outbreaks, including bark beetles, spruce budworm (20yr intervals), and butt rot (a fungi; predisposes stands 50-70yrs old to windthrow), are also important disturbances. These disturbances likely predispose the forest to fire during drought conditions. Fire Regime Group V. Surface fire is extremely rare, at greater than 1,000yr intervals, while replacement fire is more frequent, at 300 to 1,000yr intervals, and affects large patch sizes. As much as 25% of this biophysical setting may be considered a non-fire regime. In spruce-fir dominated parts of this setting, replacement fires are severe and kill most trees and understory, removing most if not all of the canopy and allowing pioneer species to emerge. Recent research indicates that on the most exposed sites, stand replacement fires in spruce-fir can result in a stable shrub-dominated community ("heath balds"). Mixed fires pass through the understory of the northern hardwood component, killing most of the smaller trees, leaving behind some large, well-established trees while creating canopy openings. Occurrence of fire is most frequent on sites where northern red oak dominates. Lumbering and fire and/ or fire alone will scarify soils and pin cherry dominates badly burned areas. Yellow birch invades stands and becomes dominant later. Invasion by spruce – fir slow on badly burned sites.

Other references

Landfire <http://www.landfire.gov/index.php>

NatureServe. 2007. International Ecological Classification Standard: Terrestrial Ecological Classifications. NatureServe Central Databases. Arlington, VA, U.S.A. Data current as of 15 April 2007.

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	
Approved by	
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:
