

## **Ecological site F127XY007WV Wet 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) Appalachian (Hemlock-)Northern Hardwood Forest

NatureServe (2007) describes this as Appalachian (Hemlock)-Northern Hardwood Forest (CES202.593)

This site crosswalks to Hemlock – Mixed Hardwood Palustrine Forest

### **Ecological site concept**

- 7) MAAT <= 45;
- 8) elev <= 973;
- 9) drainage == {Poorly drained, Very poorly drained}; Group3 Wet Uplands

and mean elevation <= 973. The soils at this site are predominately poorly drained and very poorly drained.

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

Generally ranges from PA west to Lake Erie and south to northern GA, eastern KY, southeastern OH, western NC, northwestern SC, eastern TN, southwestern WV, western VA, the Appalachian Mountains and the Cumberland Plateau.

This mixed forest occurs predominantly on mesic sites over a broad range of topographic conditions with elevations generally ranging from 1000-3000ft. Sites remain moist in all but most severe drought conditions. The BpS shifts from occupying a broad elevation range in the northern extent of the map zone (PA) to a more narrow range (higher elevation) in the southern extent of the mapzone (WV).

In the northern portion of its range it occurs primarily at higher elevations and on slope positions that favor cool, moist conditions. Soils are usually acidic and can contain a variety of parent material and drainage conditions.

At lower elevations and in the southern portion of its range, it occurs more frequently in sheltered coves and valleys. Sites are acid, generally on moist, but moderately well drained to well drained loamy or silty soils, either colluvial or alluvial. Soils are often rocky and usually deep (>40in) even if only in pockets between boulders. In riparian areas it

is usually along high gradient (1-2%) streams. Also found on lower slopes with west and south aspect, lower to mid slope on east and north aspects, and in narrow cliff bound valleys; it may occur to the base of cliffs on all slopes.

**Table 1. Dominant plant species**

Tree	(1) <i>Acer rubrum</i> (2) <i>Tsuga canadensis</i>
Shrub	Not specified
Herbaceous	Not specified

## Physiographic features

list of unique landform positions: Foothills, Summit, Toeslope

**Table 2. Representative physiographic features**

Landforms	(1) Hill (2) Mountain (3) Plateau
Flooding frequency	None
Ponding duration	Brief (2 to 7 days) to very long (more than 30 days)
Ponding frequency	None to frequent
Elevation	305–945 m
Slope	0–8%
Ponding depth	0–38 cm
Water table depth	0–38 cm
Aspect	N, S

## Climatic features

## Influencing water features

These soils are hydric

## Soil features

The soil series associated with this site are: Palms, Nolo, Lickdale, Freetown, Brinkerton, Armagh. They are Moderately deep to very deep, Very poorly drained to Poorly drained, and Slow to Rapid permeable soils, with very acidic to strongly acidic soil reaction, that formed in Colluvium, Herbaceous organic material, Residuum, Slope alluvium, Woody organic material from Clayey shale, Sandstone, Sandstone and shale, Shale, Shale and siltstone.

**Table 3. Representative soil features**

Parent material	(1) Residuum–sandstone and shale (2) Colluvium–siltstone
Surface texture	(1) Mucky loam (2) Silt loam
Family particle size	(1) Loamy
Drainage class	Very poorly drained to poorly drained
Permeability class	Slow to rapid

Soil depth	53–231 cm
Surface fragment cover <=3"	0–10%
Surface fragment cover >3"	2–10%
Available water capacity (0-101.6cm)	10.92–39.88 cm
Calcium carbonate equivalent (0-101.6cm)	0%
Electrical conductivity (0-101.6cm)	0 mmhos/cm
Sodium adsorption ratio (0-101.6cm)	0
Soil reaction (1:1 water) (0-101.6cm)	4.3–5.3
Subsurface fragment volume <=3" (Depth not specified)	0–12%
Subsurface fragment volume >3" (Depth not specified)	0–7%

## Ecological dynamics

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.

State Correlation: This site will be correlated in: PA,WV

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

Vegetation Description:

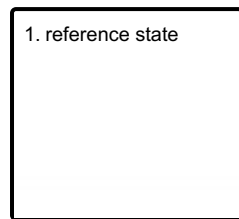
In the northern part of the range, dominant overstory species include eastern hemlock (*Tsuga canadensis*), American beech (*Fagus grandifolia*), sugar maple (*Acer saccharum*) and yellow birch (*Betula allegheniensis*). While this community as a whole occurs across a wide range of topographic conditions, the species mix can vary considerably. Hemlock will dominate the overstory on cool/moist sites at higher elevations and in shaded coves, valley bottoms and riparian areas. Moist bottomlands and footslopes may also contain a larger component of yellow birch, white ash (*Fraxinus americana*) and sycamore (*Platanus occidentalis*) (Whitney 1990). Locally, on slopes, sugar maple becomes more abundant, resulting in a beech-hemlock-sugar maple complex (Braun 2001). Other common associates include red maple (*Acer rubrum*), black cherry (*Prunus serotina*), black birch (*Betula nigra*), basswood (*Tilia americana*) and cucumber magnolia (*Magnolia acuminata*). The understory and mid-story are usually well developed and include hobblebush (*Viburnum alnifolium*), mapleleaf viburnum (*Viburnum acerifolium*), witch hazel (*Hamamelis virginiana*), serviceberry (*Amelanchier alnifolia*), pin cherry (*Prunus pensylvanica*), large-leaved holly (*Ilex monticola*), and alternative-leaved dogwood (*Cornus alternifolia*). Common herbaceous species include wild lily of the valley (*Maianthemum canadense*), sensitive fern (*Onoclea sensibilis*), shining clubmoss (*Lycopodium lucidulum*), Dryopteris spinulosa (*Dryopteris spinulosa*), mountain woodsorrel (*Oxalis montana*) and partridgeberry (*Mitchella repens*) (Lutz 1930, Braun 2001).

In the southern part of the range, dominant vegetation is generally in two to three layers. The canopy in well developed late seral conditions is composed of eastern hemlock (*Tsuga canadensis*) (most common) and or white pine (*Pinus strobus*) mixed with various hardwoods including tulip poplar (*Liriodendron tulipifera*), American beech (*Fagus grandifolia*), black and white oaks (*Quercus velutina*, *Q. alba*), black birch (*Betula lenta*), bigleaf and umbrella magnolias (*Magnolia macrophylla*, *M. tripetala*). In the southern Appalachians, Fraser magnolia (*M. fraseri*) and silverbell (*Halesia carolina*) may also be found. There may be gaps with a younger cohort of the same set of species. A dense, low to high shrub layer of great laurel (*Rhododendron maxima*) and sometimes mountain laurel (*Kalmia latifolia*) is often present. Yellowroot (*Xanthorhiza simplicissima*) may occur immediately adjacent to

streams in sandy/silty alluvial deposits in gaps. Few if any herbs are found and bryophyte and hepatophyte cover is generally restricted to downed wood, tree/shrub boles, and rocks/boulders.

## State and transition model

### Ecosystem states



### State 1 reference state

From: <http://www.naturalheritage.state.pa.us/Community.aspx?=16029> This describes a group of wetland forests that are dominated by a mixture of conifers and hardwood species. The substrate is usually mineral soil or muck over mineral soil. There is generally some groundwater enrichment in these systems. Eastern hemlock (*Tsuga canadensis*) contributes between 25% to 75% of the canopy. Other conifer species that may occur with hemlock include eastern white pine (*Pinus strobus*), red spruce (*Picea rubens*), and tamarack (*Larix laricina*). The most common hardwood species are yellow birch (*Betula alleghaniensis*), red maple (*Acer rubrum*), black ash (*Fraxinus nigra*), blackgum (*Nyssa sylvatica*), and gray birch (*Betula populifolia*). Rosebay (*Rhododendron maximum*) often forms a dense understory; other shrubs include highbush blueberry (*Vaccinium corymbosum*), winterberry (*Ilex verticillata*), swamp azalea (*Rhododendron viscosum*), and witherod (*Viburnum cassinoides*). Herbaceous species include cinnamon fern (*Osmunda cinnamomea*), sedges (e.g., *Carex trisperma*, *Carex prasina*, *Carex leptalea*), violets (*Viola* spp.), skunk-cabbage (*Symplocarpus foetidus*), false hellebore (*Veratrum viride*), sensitive fern (*Onoclea sensibilis*), partridge-berry (*Mitchella repens*), gold-thread (*Coptis trifolia*), Canada mayflower (*Maianthemum canadense*), crested wood fern (*Dryopteris cristata*), and purple-stemmed aster (*Symphyotrichum puniceum*). The bryophyte layer is usually well developed and may be dominated by sphagnum.

**Description Non-Fire Disturbance:** This system is dominated by long-lived, mesic species that form multi-layered uneven-aged forests over time. Canopy dynamics are dominated by single and multiple disturbances encouraging gap phase regeneration (Abrams and Orwig 1996). Larger disturbances include windthrow, insect attack and ice storms. Although stand-replacing wind events are rare, small to medium blowdown events are more common and occur at greater frequency on the plateau and exposed side slopes (Ruffner and Abrams 2003). Localized insect and disease outbreaks can create small to medium canopy gaps. Running the VDDT model resulted in 0.9% disturbance (fire and/or wind, weather, stress) annually, consistent with disturbance rates documented by Runkle (1981, 1985) and others. Wind, weather, stress alone resulted in 0.7% disturbance annually.

**Fire Regime Description:** Historically, this system was probably only subject to occasional fires. Fires that did occur may have been catastrophic and may have lead to even-aged stands of pine and hemlock (NatureServe 2007). Due to the predominance of cool, moist site conditions, surface and replacement fires are extremely rare, occurring at 700-1000yr intervals. Most protected sites are essentially fire free. The principal cause of fuel formation leading to fire in northern hardwood ecosystems is broad-scale, storm-driven windthrow of catastrophic proportions (Hough 1963, Runkle 1982).

### 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.

Hemlock – Mixed Hardwood Palustrine Forest <http://www.naturalheritage.state.pa.us/Community.aspx?=16029>

### Contributors

Jason Teets

## 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:**

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2. **Presence of water flow patterns:**

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3. **Number and height of erosional pedestals or terracettes:**

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4. **Bare ground from Ecological Site Description or other studies (rock, litter, lichen, moss, plant canopy are not bare ground):**

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5. **Number of gullies and erosion associated with gullies:**

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6. **Extent of wind scoured, blowouts and/or depositional areas:**

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7. **Amount of litter movement (describe size and distance expected to travel):**

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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):**
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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:**
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