Ecological site F147XY010PA
Coarse Mixed Floodplain

Last updated: 9/27/2024
Accessed: 08/29/2026

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): 147X–Northern Appalachian Ridges and Valleys

Major Land Resource Area 147 is in the Middle section of the Valley and Ridge Province of the Appalachian Highlands. Characteristic features include folded and faulted parallel ridges and valleys that are carved out of anticlines, synclines, and thrust blocks. The variability of weathering of the underlying bedrock has resulted in resistant sandstone and shale ridges separated by less resistant limestone and shale narrow to moderately broad valleys. The ridges are strongly sloping to extremely steep and have narrow, rolling crests, and the valleys are mainly level to strongly sloping. The Great Valley is a salient feature of the eastern portion and runs the entire length of the MLRA where it is called the Shenandoah Valley in the south. The western side of the MLRA is dominantly hilly to very steep and is rougher and much steeper than the rolling hills to the east. Parts of the northernmost section of the MLRA were subjected to pre-Illinoian glaciation (>770,000 years ago). Anthracite coal underlies some areas in the north and has been mined since the 1700's. Elevation in MLRA 147 generally ranges from 330 to 985 feet (100 to 300 meters) in the valleys and from 1,310 to 2,625 feet (400 to 800 meters) on the ridges and mountains. It is as high as 2,955 feet (900 meters) on some mountain crests and is nearly 4,430 feet (1,350 meters) on a few isolated, linear mountain ridges. Local relief in the valleys is about 15 to 165 feet (5 to 50 meters). The ridges rise about 660 feet (200 meters) above the adjoining valleys. (USDA, 2006).

Classification relationships

This ecological site is found in Major Land Resource Area 147- Northern Appalachian Ridges and Valleys, 148. MLRA 147 is located within Land Resource Region S - Northern Atlantic Slope Diversified Farming Region (USDA 2006), and in United States Forest Service ecoregion M221 – Central Appalachian Broadleaf Forest-Coniferous Forest-Meadow Province (Bailey, 1995). In addition, MLRA 147 falls within area #67 of EPA Ecoregion Level III – the Ridge and Valley (US EPA 2013). The Coarse Mixed Floodplain ecological site occurs primarily within 67b, and 67da of EPA Ecoregion IV - Northern Shale Valleys, and Northern Dissected Ridges and Knobs respectively (Woods et. al. 1996).

Ecological site concept

The Coarse Mixed Floodplain ecological sites are found on floodplains predominantly in small to medium stream and river valleys that drain the shale and sandstone uplands in MLRA 147, Northern Appalachian Ridges and Valleys. It occupies first bottoms of rivers and streams and natural levees. The soil and landscape characteristics are the result of high water velocity movement that favors the deposition of coarser, sandier and gravelly sediments relative to the silt loams, silty clay loams, and fine sandy loam textures of the Loamy Mixed Floodplain Ecological site. The underlying soil material formed in recent coarse alluvium derived from mixed sedimentary geology including sandstones, shales, siltstones, and limestone. They are well drained with moderate to rapid permeability. Soil textures range from sandy loams to coarse sands and gravels. These areas are subject to frequent flooding as classified by the National Soil Survey Handbook (USDA 2016). This is defined as more than a 50 percent chance of flooding in any year. Much of this ecological site has been cleared for hay and pasture. Where forest exists, and flooding is frequent they are dominated by Betula nigra (River birch) and Platanus occidentalis (American sycamore) with associates including Acer negundo (Boxelder) and occasionally Acer saccharinum (Silver maple) and Fraxinus pennsylvanica (Green ash). In areas where flooding and ice-scouring is relatively more powerful, an early-successional woodland community may predominate that is characterized by stunted, usually battered and flood-trained trees of Platanus occidentalis and Betula nigra, with Salix species (willow) in the shrub layer.

Associated sites

F147XY009PA	**Loamy Mixed Floodplain** Loamy Mixed Floodplain

Table 1. Dominant plant species

Tree	(1) *Betula nigra* (2) *Platanus occidentalis*
Shrub	Not specified
Herbaceous	(1) *Impatiens capensis*

Physiographic features

The Coarse Mixed Floodplain ecological sites are found on floodplains in stream and river valleys in MLRA 147, Northern Appalachian Ridges and Valleys. This ecological site may also be found on toe slopes and stream terraces. This ecological site occupies first bottoms of rivers and streams and may form natural levees. These areas are the result of high water velocity movement that favors the deposition of coarser, sandier and gravelly sediments relative to the silt loams, silty clay loams, and fine sandy loam textures of the Loamy Mixed Floodplain Ecological site. The parent material is recent coarse textured alluvium from mixed sedimentary geology of sandstone, siltstone, shale, and limestone. Slope is less than 5 percent. This ecological site is subject to very brief (4 to 48 hours) flooding, but in some instances flooding can be longer than 7 days. Most areas are well drained, permeability is moderately rapid to rapid, and bedrock is greater than 60 inches (152 cm) deep. These sites are in forests, pasture, and hayland.

Table 2. Representative physiographic features

Landforms	(1) Flood plain (2) Stream terrace (3) Natural levee
Runoff class	Very low to low
Flooding duration	Very brief (4 to 48 hours) to long (7 to 30 days)
Flooding frequency	None to frequent
Elevation	30 – 670 m
Slope	0 – 10 %
Water table depth	150 cm
Aspect	Aspect is not a significant factor

Climatic features

The climate of this region is temperate and humid. The Ridge and Valley Province is not rugged enough for a true mountain type of climate but it does have many of the characteristics of such a climate (Daily 1971). The influence of the high and low topography on air movement causes somewhat greater temperature extremes than are experienced in the Piedmont region to the east. The differences in elevation also affect the length of the frost free season on the ridges verses that in the valleys. The cooler temperatures and the shorter freeze-free periods occur at the higher elevations and in the more northern latitudes. The maximum precipitation occurs from early spring through mid-summer, and the minimum occurs in January and February. The average annual snowfall ranges from 16 to more than 51 inches (40 to 130 centimeters). The average annual temperature is 44 to 57 degrees F (7 to 14 degrees C). A portion of this region that extends from Maryland southward through most of the Shenandoah Valley in Virginia falls within a rain shadow cast by the Appalachian Mountains to the west and the Blue Ridge Mountains to the east. The mountains on either side block moist flowing air from either the east or the west causing the valleys to be drier. Average annual precipitation in this shadow area can average 34 to 36 in/year (86 to 91cm) compared to 40 to 42 in/year (102 - 107 cm) for the rest of the region (PRISM 2013).

Data for mean annual precipitation, frost-free and freeze-free periods and monthly precipitation for this ecological site are shown below. The original data used in developing the tables was obtained from the USDA-NRCS National Water & Climate Center (2015) climate information database for 3 weather stations throughout MLRA 147 in proximity to this ecological site. All climate station monthly averages for maximum and minimum temperature and precipitation were then added together and averaged to make this table.

Table 3 Representative climatic features

Frost-free period (characteristic range)	120-140 days
Freeze-free period (characteristic range)	150-170 days
Precipitation total (characteristic range)	940-1,070 mm
Frost-free period (actual range)	120-140 days
Freeze-free period (actual range)	140-170 days
Precipitation total (actual range)	910-1,120 mm
Frost-free period (average)	130 days
Freeze-free period (average)	160 days
Precipitation total (average)	990 mm

- (1) HANCOCK [USC00184030], Hancock, MD
- (2) MILLGAP [USC00445595], Monterey, VA
- (3) WARDENSVILLE RM FARM [USC00469281], Wardensville, WV

Influencing water features

This ecological site may be influenced influenced by flood events.

Soil features

The representative soil series associated with this site are: Potomac, Nelse, Millrock, and Craigsville. These soils formed in recent coarse alluvium derived from mixed sedimentary geology including sandstones, shales, siltstones, and limestone. They are well drained with

moderate to rapid permeability. Surface textures are predominantly sandy loams but also include fine sandy loam, loamy fine sand, loamy sand, and loams. Subsoil is sandy and loamy. Depth to bedrock is over 60 inches (152 cm). These soils are on floodplains that are subject to rare to frequent flooding that usually lasts just a few hours. Lower horizons are composed of stratified sands and sometimes gravels. Soils data was obtained from the Natural Resources and Conservation Service (NRCS) National Soils Information System database (USDA 2015).

Table 4. Representative soil features

Parent material	(1) Alluvium – sandstone
Surface texture	(1) Very cobbly sandy loam (2) Fine sandy loam (3) Gravelly loamy sand
Family particle size	(1) Sandy
Drainage class	Well drained to somewhat excessively drained
Permeability class	Moderately rapid to rapid
Soil depth	230 cm
Surface fragment cover <=3"	Not specified
Surface fragment cover >3"	Not specified
Available water capacity (0-101.6cm)	5.59 – 11.43 cm
Soil reaction (1:1 water) (0-101.6cm)	4.8 – 6.7
Subsurface fragment volume <=3" (Depth not specified)	0 – 40 %
Subsurface fragment volume >3" (Depth not specified)	0 – 60 %

Ecological dynamics

The vegetation groupings described in this section are based on the terrestrial ecological system classification and vegetation associations developed by NatureServe (Comer 2003) and the Natural Heritage Programs of Pennsylvania (Zimmerman et al. 2012),

Virginia (Fleming et al. 2013), West Virginia (WVDNR 2014), and Maryland (Harrison 2004). Terrestrial ecological systems are specifically defined as a group of plant community types (associations) that tend to co-occur within landscapes with similar ecological processes, substrates, and/or environmental gradients. They are intended to provide a classification unit that is readily mappable, often from remote imagery, and readily identifiable by conservation and resource managers in the field. A given system will typically manifest itself in a landscape at intermediate geographic scales of tens to thousands of hectares and will persist for 50 or more years. A vegetation association is a plant community that is much more specific to a given soil, geology, landform, climate, hydrology, and disturbance history. It is the basic unit for vegetation classification. Each association will be named by the dominant species that occupy the different strata (tree, sapling, shrub, and herb). Within the NatureServe database, individual vegetation associations are assigned an identification number called a Community Element Global Code (CEGL).

The Coarse Mixed Floodplain Ecological Site is located in the Ridge and Valley region of the Appalachian Highlands, an area that has undergone extensive human disturbance since pre and post-European settlement times (Braun, 1950). The reference forest community is part of the Central Appalachian River Floodplain system (CES202.608) (Nature Serve 2009). Much of this ecological site has been cleared for hay and pasture. Where forests exists, and flooding is frequent, Betula nigra (River birch) and Platanus occidentalis (American sycamore) dominate with associates including Acer negundo (Boxelder) and occasionally Acer saccharinum (Silver maple) and Fraxinus pennsylvanica (Green ash). In areas where flooding and ice-scouring is relatively more powerful, an early-successional woodland community may predominate that is characterized by stunted, usually battered and flood-trained trees of Platanus occidentalis and Betula nigra, with Salix species (willow) in the shrub layer.

Much of the Coarse Mixed Floodplain ecological site has been cleared for hayland and pasture. Successional forests that recolonize former agricultural fields or other disturbed areas are often dominated by Juglans nigra (Black walnut) but can also contain Liriodendron tulipifera (Tuliptree), Robinia pseudoacacia (Black locust), Fraxinus Americana (White ash), Ulmus Americana (American elm), Platanus occidentalis (American sycamore), and Acer saccharum (Sugar maple). The subcanopy may include Carya cordiformis (Bitternut hickory), Celtis occidentalis (Common hackberry), Sassafras albidum (Sassafras), and Carpinus caroliniana (American hornbeam). The shrub layer may include Asimina triloba (Pawpaw), Viburnum prunifolium (Blackhaw), Lindera benzoin (Spicebush), and a host of exotic invasive species including Rosa multiflora (Multiflora rose), Microstegium vimineum (Nepalese browntop), Alliaria petiolate (Garlic mustard), and Persicaria longiseta (Smartweed).

State and transition model

Additional community tables

Table 5. Community 1.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production ()	Foliar Cover (%)

Table 6. Community 1.2 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production ()	Foliar Cover (%)

Table 7. Community 2.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production ()	Foliar Cover (%)

Table 8. Community 3.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production ()	Foliar Cover (%)

Table 9. Community 3.2 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production ()	Foliar Cover (%)

Inventory data references

Site Development and Testing Plan 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.

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Approval

Nels Barrett, 9/27/2024

Acknowledgments

The following people assisted with the development of this provisional ecological site report: Yuri Plowden, Ecological Site Specialist, NRCS, Mill Hall, PA Aron Sattler, 6-MIL Soil Survey Project Leader, NRCS, Mill Hall, PA Mike McDevitt, Soil Scientist, Mill Hall, PA Nels Barrett, Ph.D, Regional Ecological Site Specialist, NRCS, Amherst, MA Ephraim Zimmerman, Ecological Assessment Manager, Western PA Conservancy, Pittsburgh, PA Don Flegel, Resource Soil Scientist, NRCS, Harrisonburg, VA Kevin Godsey, Ecological Site Specialist, NRCS, Springfield, MO

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	08/29/2026
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):**

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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:**
