Ecological site F122XY030TN
Moderately Well Drained Loamy Alluvium

Last updated: 5/14/2025
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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): 122X–Highland Rim and Pennyroyal

MLRA 122 is in Tennessee (47 percent), Kentucky (43 percent), Indiana (7 percent), and Alabama (3 percent). It makes up about 21,530 square miles (55,790 square kilometers). SOILS: Many of the soils in this MLRA are Udalfs. The moderately deep to very deep, well drained, clayey soils formed in limestone residuum. They are dominantly in rolling to steep areas of the “Outer Basin” (Mimosa, Braxton, Gladdice, and Hampshire series) and the undulating to hilly areas of the “Inner Basin” (Talbott and Bradyville series). The most agriculturally productive soils are the very deep, well drained, clayey or loamy soils that formed in alluvium and/or loess over alluvium or limestone residuum in nearly level to undulating areas (Armour, Cumberland, Harpeth, Lomond, and Maury series). The less extensive soils generally are moderately well drained to somewhat poorly drained and formed in loamy or clayey alluvium and/or residuum (Byler, Capshaw, Colbert, and Tupelo series). This MLRA has a significant acreage of Mollisols. Shallow or moderately deep, well drained, clayey Udolls (Ashwood and Barfield series) formed in limestone residuum dominantly in rolling to steep areas. Very shallow, well drained, clayey Rendolls (Gladeville series) formed in limestone residuum dominantly in undulating to rolling areas of the “Inner Basin.” Very deep, well drained or moderately well drained Udolls (Arrington, Egam, Lynnville, and Staser series) and somewhat poorly drained or poorly drained Aquolls (Agee, Godwin, and Lanton series) formed in loamy or clayey alluvium derived from limestone on flood plains. Most of the remaining soils on flood plains are moderately well drained or well drained Udepts (Lindell and Ocana series). Udults are of small extent in this area. Most are very deep, well drained, and loamy and formed in gravelly colluvium or colluvium and the underlying residuum on steep hillsides (Dellrose soils). Rock outcrops are common on uplands. BIOLOGICAL RESOURCES: This area supports mixed oak forest vegetation. White oak, black oak, northern red oak, and some scarlet oak are the dominant tree species. Shagbark hickory, bitternut hickory, pignut hickory, and mockernut hickory also occur. Oak, blackgum, flowering dogwood, sassafras, Virginia pine, pitch pine, and shortleaf pine grow mostly on ridgetops. (Excerpt from United States Department of Agriculture, Natural Resources Conservation Service. 2006. Land Resource Regions and Major Land Resource Areas of the United States, the Caribbean, and the Pacific Basin. U.S. Department of Agriculture Handbook 296.)

Classification relationships

NatureServe Scientific Name: South-Central Interior Large Floodplain -Unique Identifier: CES202.705 NatureServe Scientific Name: South-Central Interior Small Stream and Riparian- Unique Identifier: CES202.706

Ecological site concept

The communities described in this provisional document reflect plant communities that are likely to be found on these soils and have not been field verified. This PES describes hypotheses based on available data of many different scales and sources and has not been developed utilizing site-specific ecological field monitoring. This PES does not encompass the entire complexity or diversity of these sites. Field studies would be required for detailed conservation planning or to develop a comprehensive and science-based restoration plan for these sites. Ecological Dynamics Only two tree species can be selected for entry into the ESIS/EDIT database as dominants; however, multiple tree species may be co-dominant on these sites and it will vary depending on aspect, soil depth, seed sources, management, and disturbance history. State 1. Phase 1.1. (Reference): Forestland Plant species dominants: northern red oak (Quercus rubra) - white oak (Quercus alba) / paw paw (Asimina triloba) - hawthorns (Crataegus spp.) / grape (Vitis spp.) - Virginia creeper (Parthenocissus quinquefolia) State: 2. Phase 2.1. Pasture Plant species dominant: Schedonorus arundinaceus (tall fescue) Pasture plant species are dependent on seeding, weed control, concurrent land uses, on-going levels of disturbance, and landowner goals. Individual site and soil characteristics, along with management activities, will influence production levels. State: 3. Phase 3.1. Transitional Field Plant species dominants: maple (Acer spp.) –tulip poplar (Liriodendron tulipifera)/ berries (Rubus spp.) – roses (Rosa spp.) / ironweed (Vernonia gigantea) –tall fescue (Schedonorus arundinaceus) State 4: Phase 4.1. Abandoned Croplands Plant species dominant: henbit deadnettle (Lamium amplexicaule) – mouse-eared chickweed (Cerastium L.) Abandonment of cropland would result in many weed species taking over the site. Initially, annual weeds would be predominate followed by grasses, shrubs and finally, pioneers trees. State 5.0. Phase 5.1.

Cropland Plant species dominants: dependent upon seeding and management. Most common crops are corn and soybeans. This state can be transitioned to any of the other states with sufficient management inputs: forest restoration and timber stand management, pasture plantings, long-term weed control, etc. Transitioning this state to a reference condition will require extensive timber stand improvement practices to control non-native vegetation and manage for desired species.

Associated sites

F122XY033TN	**Well Drained Loamy Alluvium** Well Drained Loamy Alluvium

Table 1. Dominant plant species

Tree	(1) *Quercus rubra* (2) *Quercus alba*
Shrub	(1) *Asimina triloba* (2) *Crataegus*
Herbaceous	(1) *Vitis* (2) *Parthenocissus quinquefolia*

Physiographic features

These sites are location in floodplains throughout MLRA 122.

Table 2. Representative physiographic features

Landforms	(1) Flood plain
Runoff class	Very low to very high
Flooding duration	Very brief (4 to 48 hours) to brief (2 to 7 days)
Flooding frequency	None to frequent
Ponding duration	Very brief (4 to 48 hours) to brief (2 to 7 days)
Ponding frequency	None to occasional
Elevation	110 – 310 m
Slope	0 %
Ponding depth	0 – 100 cm

Water table depth	30 – 110 cm
Aspect	Aspect is not a significant factor

Climatic features

Climate
The average annual precipitation in this area is 43 to 63
inches (1,090 to 1,600 millimeters), increasing to the south. The maximum precipitation occurs in winter and early in spring, and the minimum occurs in fall. Most of the rainfall occurs as high-intensity, convective thunderstorms. Snowfall may occur in winter. The average annual temperature is 52 to 60 degrees F (11 to 16 degrees C), increasing to the south. The freeze-free period averages 210 days and ranges from 185 to 235 days. The longer freeze-free periods occur in the more southerly parts of the area.

(Excerpt from United States Department of Agriculture, Natural Resources Conservation Service. 2006. Land Resource Regions and Major Land Resource Areas of the United States, the Caribbean, and the Pacific Basin. U.S. Department of Agriculture Handbook 296.)

Table 3 Representative climatic features

Frost-free period (characteristic range)	160-170 days
Freeze-free period (characteristic range)	190-210 days
Precipitation total (characteristic range)	1,300-1,450 mm
Frost-free period (actual range)	160-170 days
Freeze-free period (actual range)	190-210 days
Precipitation total (actual range)	1,300-1,500 mm
Frost-free period (average)	170 days
Freeze-free period (average)	200 days
Precipitation total (average)	1,400 mm

- (1) COOKEVILLE [USC00402009], Cookeville, TN
- (2) WAYNESBORO [USC00409502], Waynesboro, TN
- (3) CLARKSVILLE WWTP [USC00401790], Clarksville, TN
- (4) SCOTTSVILLE [USC00157215], Scottsville, KY

Influencing water features

Some mapunits in this group may experience very brief to brief flooding or ponding.

Soil features

These soil are alluvium and moderately well drained.

Table 4. Representative soil features

Parent material	(1) Alluvium – limestone
Surface texture	(1) Silt loam (2) Loam (3) Silty clay loam
Family particle size	(1) Loamy
Drainage class	Moderately well drained to well drained
Permeability class	Moderately slow to moderately rapid
Soil depth	200 cm
Surface fragment cover <=3"	Not specified
Surface fragment cover >3"	Not specified
Available water capacity (0-101.6cm)	10.41 – 19.05 cm
Calcium carbonate equivalent (0-101.6cm)	Not specified
Electrical conductivity (0-101.6cm)	Not specified
Sodium adsorption ratio (0-101.6cm)	Not specified
Soil reaction (1:1 water) (0-101.6cm)	5.3 – 6.5

Subsurface fragment volume <=3" (Depth not specified)	0 – 50 %
Subsurface fragment volume >3" (Depth not specified)	Not specified

Ecological dynamics

30-Moderately Well Drained Loamy Alluvium
MLRA 122
Soil series included in this preliminary grouping: Hamblen, Lobelville, Tigrett (Houston Co. TN only)

Future field work may determine that this grouping be modified or split into multiple ecological site descriptions (ESDs). Additional soils may be added pending field verification.

The natural vegetation of these sites will vary in relationship to the setting, patterns of drainage, disturbances, and previous vegetation communities. Individual sites deserve a detailed understanding before conservation and restoration practices are implemented. The provisional ecological site (PES) communities described in this document reflect plant communities that are likely to be found but do not encompass the entire complexity or diversity of these sites. Future field work is required develop a full ESD which can be utilized for conservation planning purposes.

NASIS data list trees on site for mapunits in this group include: white oak, southern red oak, yellow poplar, sweetgum, pines, and black walnut. Other mapunits list swamp white oak, eastern cottonwood, American sycamore, and yellow poplar.

The NRCS county soil surveys list various hardwoods on site, including both upland and bottomland species. Multiple counties list uplands species such as white oak, southern red oak, tulip poplar, white ash, black walnut, and various pines. Perry, Clay and Lewis County soil surveys describe a bottomland ecological community that includes swamp white oak, American sycamore, eastern cottonwood, sweetgum, and tulip poplar. Field verification is needed to evaluate and determine not only the appropriate mapunits for this group, but also the actual forest composition prior to conservation planning or restoration on these sites.

Vegetation in the official soil series description (OSD):
Hamblen: Most of the acreage is cleared and used for crops, hay and pasture. The native vegetation was hardwood forest consisting chiefly of oaks, hickories, maples, elm, yellow-poplar, and sycamore.
Lobelville: Most of the soil is cleared and is cultivated or used for pasture. The main crops are corn, soybeans, and hay. The natural vegetation was mixed hardwoods.
Tigrett: no OSD found.

The following information is from Glendon Smalley’s U.S. Forest Service technical report SO-43 entitled, “Classification and Evaluation of Forest Sites on the Eastern Highland Rim and Pennyroyal.”

Description of Landtype 8: Footslopes, Terraces, and Stream bottoms With Good Drainage
Dominant soils include Hamblen, Lobelville
Vegetation: white oak, yellow-poplar, northern red oak, blackgum, hickories, sweetgum, red maple, and American sycamore; occasional cottonwood, elms, American beech, hackberry, black oak, eastern redcedar, black walnut, black cherry, white ash, sugar maple, loblolly pine, river birch, shortleaf pine, and Virginia pine, Dogwoods, cane, persimmon, American hornbeam, spicebush, eastern redbud, vacciniums, sassafras, boxelder, pawpaw, euonymuses, hawthorns, and hydrangea are common in the understory.

Description of Landtype 18: Upland Flats, Depressions, and Sinkholes With Good Drainage
Dominant soils include Lobelville
Vegetation- white oak, black oak, hickories, red maple, northern red oak, sweetgum, yellow-poplar, and elms. Occasional - black cherry, black walnut, white ash, sugar maple, American sycamore, southern red oak, scarlet oak, hackberry, sugarberry, American beech, loblolly pine, shortleaf pine, and eastern redcedar. Dogwoods, euonymuses, vacciniums, cane, sassafras, and elms are common in the understory.

Description of Landtype 21: Footslopes, Terraces, and Stream bottoms With Good
Drainage in Coves
Dominant soils include Hamblen
Vegetation- white oak, yellow-poplar, northern red oak, blackgum, hickories, sweetgum, red maple, and American sycamore. Occasional trees: cottonwood, elms, American beech, hackberry, black oak, eastern redcedar, black walnut, black cherry, white ash, sugar maple,

loblolly pine, shortleaf pine southern red oak, boxelder, and Virginia pine. Flowering dogwood, cane, persimmon, American hornbeam, eastern redbud, vacciniums, sassafras, sourwood, pawpaw, euonymuses, hawthorns, and hydrangeas are common in the understory,

Description of Landtype 44: Terraces and Floodplains with Good Drainage
Dominant soils include Hamblen
Vegetation-White oak, southern red oak, sweetgum, yellow-poplar, blackgum, elms, red maple, and hickories; occasional willow oak, water oak, river birch, American sycamore, American beech, silver maple, black willow, hackberry, sugarberry, boxelder, black oak, Shumard oak, cherrybark oak, cottonwood, northern red oak, black cherry, white ash, black walnut, white basswood, loblolly pine, honey locust, persimmon, and sassafras. Dogwoods, cane, hawthorns, sumacs, American hornbeam, eastern hophornbeam, American holly, vacciniums, grape, pawpaw, euonymuses, bladdernut, willows, and red mulberry are common in the understory.

Description of Landtype 48: Terraces and Floodplains with Good Drainage
Dominant soils include Hamblen.
Vegetation-- oak, southern red oak, sweetgum, yellow-poplar, blackgum, elms, red maple, and hickories; occasional willow oak, water oak, river birch, American sycamore, American beech, silver maple, black willow, pin oak, hackberry, boxelder, Shumard oak, cottonwood, black oak, northern red oak, black cherry, white ash, black walnut, honey locust, sugar maple, yellow buckeye, persimmon, and sassafras, dogwoods, cane, hawthorns, sumacs, American hornbeam, eastern hophornbeam, vacciniums, grape, pawpaw, euonymuses, bladdernut, American holly, willows, and red mulberry are common in the understory.

Ecological Dynamics

Only two tree species can be selected for entry into the ESIS/EDIT database as dominants; however, multiple tree species may be co-dominant on these sites and it will vary depending on aspect, soil depth, seed sources, management, and disturbance history.

State 1. Phase 1.1. (Reference): Forestland Plant species dominants: northern red oak (Quercus rubra)- white oak (Quercus alba) / paw (Asimina triloba) - hawthorns (Crataegus spp.) / grape (Vitis spp.) - Virginia creeper (Parthenocissus quinquefolia

Trees on these sites will vary depending on age of stand, previous disturbances, on-going levels of disturbance (such as grazing or logging), aspect, and soil depth. Other trees possible for these sites include: Acer saccharum (sugar maple), Acer rubrum (red maple), tulip poplar (Liriodendron tulipifera), Fraxinus spp. (ash), Juglans nigra (black walnut), Tilia americana (basswood), Carya cordiformis (bitternut hickory), Carya tomentosa (mockernut hickory), and Ulmus americana (American elm).

Without disturbances, a rich herb and forb layer would be present. Spring wildflowers are prolific on undisturbed, old-growth locations.

State: 2. Phase 2.1. Pasture
Plant species dominant: Schedonorus arundinaceus (tall fescue)

Pasture plant species are dependent on seeding, weed control, concurrent land uses, on-going levels of disturbance, and landowner goals. Individual site and soil characteristics, along with management activities, will influence production levels.

Many species of grass, both warm and cool season, are available and suitable for these sites. Common forage species include tall fescue, orchard grass, Kentucky bluegrass, Johnson grass, timothy, and various species of clover. Depending on levels of management, dozens of weed species may be present.

Management of pasture sites should follow conservation planning standards and protocols which include watershed protection, soil health, and adequate forage species.

Transitioning this state to a reference condition would require long-term timber stand improvement practices to control non-native vegetation and manage for desired hardwood species.

State: 3. Phase 3.1. Transitional Field
Plant species dominants: maple (Acer spp.) –tulip poplar (Liriodendron tulipifera)/ berries (Rubus spp.) – roses (Rosa spp.) / ironweed (Vernonia gigantea) –tall fescue (Schedonorus arundinaceus)

State 3 is a successional state that would occur after pasture management ceases. Typified by a variety of grasses, forbs, herbs, and young trees, these sites are usually wildlife friendly, pollinator beneficial, and are often maintained by landowners to maximize wildlife habitat.

Trees found on site are a mix depending on seed sources and age of the site. Hardwood seedlings and saplings are abundant depending on seed sources. Multiflora rose, briars, berries and brambles a frequent component. Likely species included Queen Anne’s lace (Daucus carota), mullein (Verbascum thapsus) thistles (Cirsium spp.), lambs quarters (Chenopodium album), horse nettle (Solanum carolinense) and pigweed (Amaranthus albus). Native species may include giant ironweed (Vernonia gigantea), common milkweed (Asclepias syriaca), goldenrods (Solidago spp.), sunflowers (Helianthus spp.), white crownbeard (Verbesina virginica), yellow crownbeard (V. occidentalis), lowland wingstem (Verbesina alternifolia) and blue mist-flower (Conoclinium coelestinum).

Transitioning this state to a reference condition will require management inputs including timber stand improvement practices and control of non-native vegetation.

State 4: Phase 4.1. Abandoned Croplands
Plant species dominant:
henbit deadnettle (Lamium amplexicaule) – mouse-eared chickweed (Cerastium L.)

Abandonment of cropland would result in many weed species taking over the site. Initially, annual weeds would be predominate followed by grasses, shrubs and finally, pioneers trees.

It would require years of management, plantings, and weed control to establish successional communities that could transition to a reference community.

State 5.0. Phase 5.1. Cropland

Plant species dominants: dependent upon seeding and management. Most common crops are corn and soybeans.

This state can be transitioned to any of the other states with sufficient management inputs: forest restoration and timber stand management, pasture plantings, long-term weed control, etc. Transitioning this state to a reference condition will require extensive timber stand improvement practices to control non-native vegetation and manage for desired species.

TO VALIDATE THE INFORMATION IN THIS PROVISIONAL ECOLOGICAL SITE DESCRIPTION FUTURE FIELD WORK IS NEEDED. This will include detail field inspections and monitoring and multi-site data collection including medium to high intensity vegetation sampling, soil correlations, and an in-depth analysis of gathered data. A final field review, peer review, quality control, and quality assurance reviews of the ESD will be needed to produce a document to be utilized for accurate on-site conservation planning.

State and transition model

Figure 7. 30-MWD Loamy Alluvium

Additional community tables

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

Matthew Duvall, 5/14/2025

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	08/30/2026
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:**
