

# Ecological site F122XY027TN

## Loamy Terraces

Accessed: 04/25/2024

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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” (Talbot 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, Lynnvill, 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). Udufts 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

Scientific Name: Southern Interior Low Plateau Dry-Mesic Oak Forest, Unique Identifier: CES202.898

### 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.

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.

State 1. Phase 1.1. (Reference): Provisional Ecological Site (PES)

Plant species dominants:

white oak (*Quercus alba*)- northern red oak / spicebush (*Lindera benzoin*) - wild hydrangea (*Hydrangea arborescens*) / bursting heart (*Euonymus americanus*)

Understory plants will likely include vacciniums, hawthorns, hydrangeas, grapes, euonymuses, Virginia creeper, bedstraws, ferns, and an array of spring wildflowers.

State: 2. Phase 2.1. Pasture

Plant species dominants: *Schedonorus arundinaceus* (tall fescue)

Pasture plant species are dependent on seeding, weed control, concurrent land uses, on-going levels of disturbance, and landowner goals.

State: 3. Phase 3.1: Transitional (Abandoned) Field

Plant species dominants: maples (*Acer* spp.) - tulip poplar (*Liriodendron tulipifera*) / multiflora rose (*Rosa multiflora*) - berries (*Rubus* spp.) / tall fescue (*Schedonorus arundinaceus*)

Tree species regeneration on these sites will depend on the disturbances, adjacent plant communities and aspect.

State 4: Phase 4.1. Abandoned Croplands

Plant species dominant:

henbit deadnettle (*Lamium amplexicaule*) – mouse-eared chickweed (*Cerastium* L. )

State 5: Phase 5.1. Cropland

Phase 4.1: Plant species dominants: *Zea* spp. – *Glycine* spp.

Plants on these sites will be dependent upon seeding and management.

**Table 1. Dominant plant species**

Tree	(1) <i>Quercus alba</i> (2) <i>Quercus rubra</i>
Shrub	(1) <i>Asimina triloba</i> (2) <i>Hydrangea arborescens</i>
Herbaceous	(1) <i>Euonymus americanus</i>

## Physiographic features

These sites are located on terraces in MLRA 122.

**Table 2. Representative physiographic features**

Landforms	(1) Terrace
Flooding duration	Extremely brief (0.1 to 4 hours) to brief (2 to 7 days)
Flooding frequency	None to occasional
Ponding frequency	None
Elevation	360–1,800 ft
Slope	0–25%

Water table depth	14–66 in
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### Climatic features

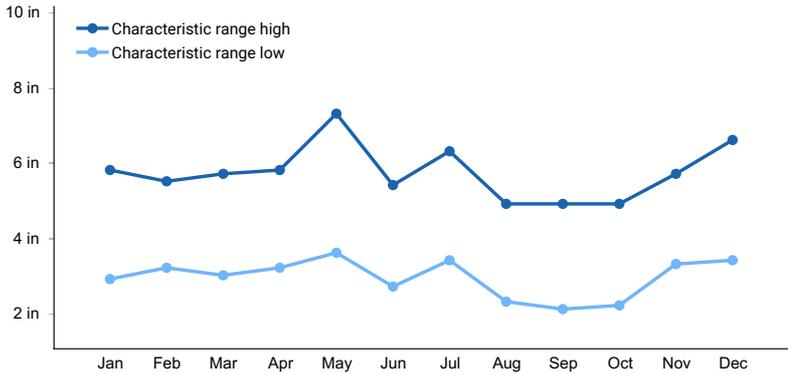
#### Climate

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.

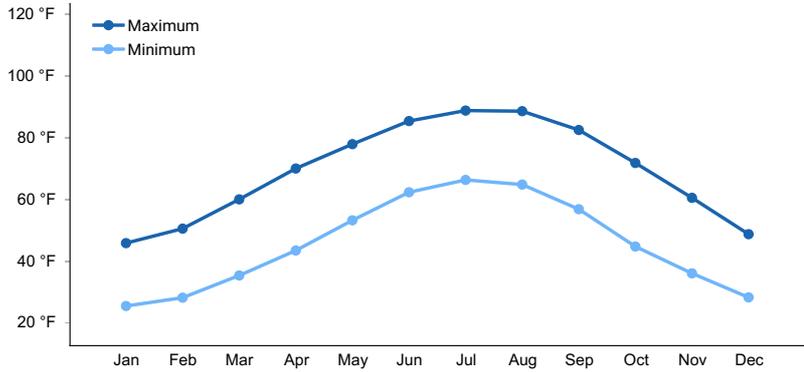
(Excerpt from United States Department of Agriculture, Natural Resources Conservation Service. 2006. Land Resource Regions and Major Land Resource Areas of the United States, the Caribbean, and the Pacific Basin. U.S. Department of Agriculture Handbook 296.)

**Table 3. Representative climatic features**

Frost-free period (average)	175 days
Freeze-free period (average)	198 days
Precipitation total (average)	56 in



**Figure 1. Monthly precipitation range**



**Figure 2. Monthly average minimum and maximum temperature**

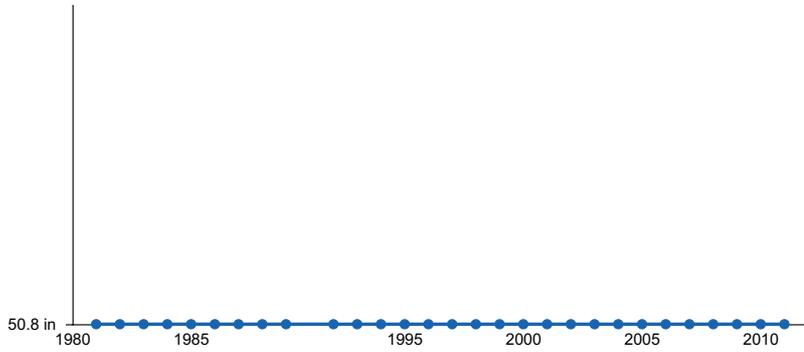


Figure 3. Annual precipitation pattern

### Climate stations used

- (1) GREENSBURG [USC00153430], Greensburg, KY
- (2) HOPKINSVILLE [USC00153994], Hopkinsville, KY
- (3) COOKEVILLE [USC00402009], Cookeville, TN
- (4) WAYNESBORO [USC00409502], Waynesboro, TN

### Influencing water features

These sites have no influencing water features.

### Soil features

These soils are very deep, moderately well drained to well drained, loamy and located on terraces in MLRA 122.

Table 4. Representative soil features

Parent material	(1) Alluvium–cherty limestone
Surface texture	(1) Very gravelly fine sandy loam (2) Loam (3) Silt loam
Family particle size	(1) Loamy
Drainage class	Well drained
Permeability class	Moderate to rapid
Soil depth	80 in
Surface fragment cover <=3"	0%
Surface fragment cover >3"	0%
Available water capacity (0-40in)	4–7 in
Calcium carbonate equivalent (0-40in)	0%
Electrical conductivity (0-40in)	0 mmhos/cm
Sodium adsorption ratio (0-40in)	0
Soil reaction (1:1 water) (0-40in)	5–5.5
Subsurface fragment volume <=3" (Depth not specified)	0–43%

Subsurface fragment volume >3" (Depth not specified)	0–5%
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## Ecological dynamics

27 – Loamy Terraces  
MLRA 122

Soil series included in this preliminary grouping: Bewleyville, Etowah, Holston, Humphreys, Pickwick, Statler, Trace, Tigrett, Whitwell.

Future ESD development will likely result in mapunits being added and removed from this initial group.

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 communities described in this document reflect plant communities that can be found on these soils but do not encompass the entire complexity or diversity of these sites. Field work is required to delineate and develop a full ecological site description which can be utilized for conservation uses.

The PES reference community was determined by information gathered from NASIS, NRCS county soil surveys (trees on site, common trees) and 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."

NASIS data and county soil surveys list additional trees on site as northern red oak, hickories, sugar maple, elm, American beech, tulip poplar, sassafras, and pines. White oak and southern red oak are the predominant trees in NASIS.

Forest trees listed in OSDs are as follows:

Bewleyville: Original vegetation was oaks, hickory, tulip poplar, elm, beech, and shortleaf, and Virginia pine.

Etowah: Original vegetation was oaks, hickory, tulip poplar, elm, beech, and shortleaf, and Virginia pine.

Holston: Originally, forests were mixed hardwoods and pines chiefly oak species, hickory, dogwood, yellow-poplar, elm, beech, and shortleaf, loblolly, and Virginia pines.

Pickwick: Mostly cleared and used for growing cotton, corn, small grains, hay, and pasture. A small acreage is in forest of oaks, hickory, poplar, beech, gum, and elm.

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 2: Broad Ridges-North Aspect

Dominant soils include: Bewleyville

Vegetation-White oak, southern red oak, black oak, northern red oak, hickories, blackgum, shortleaf pine, and loblolly pine; occasional eastern redcedar, chestnut oak, post oak, yellow-poplar, red maple, black walnut, white ash, black cherry, and Virginia pine. Flowering dogwood, scarlet oak, sassafras, persimmon, vacciniums, and winged elm are common in the understory.

Description of Landtype 3: Broad Ridge South Aspect

Dominant soils include: Bewleyville

Vegetation-Southern red oak, scarlet oak, post oak, white oak, chestnut oak, hickories, blackgum, shortleaf pine, loblolly pine, and Virginia pine; occasional black oak, red maple, yellow-poplar, and eastern redcedar. Sassafras, flowering dogwood, vacciniums, persimmon, and winged elm are common in the understory.

Description of Landtype 8: Footslopes, Terraces, and Stream bottoms- Good Drainage

Dominant soils include non-cherty Etowah, Humphreys.

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 14: Hilly Redlands-North Aspect

Dominant soils include: Bewleyville

Vegetation-Southern red oak, scarlet oak, white oak, chestnut oak, black oak, red maple, hickories, yellow-poplar, northern red oak, and eastern redcedar. Occasional. American beech, elms, white ash, black walnut, black cherry, bur oak, sugar maple, loblolly pine, shortleaf pine, hackberry, and Virginia pine. Flowering dogwood, persimmon, sassafras, sourwood, eastern hophornbeam, wild plum, and red mulberry are common in the understory.

#### Description of Landtype 15: Hilly Redland South Aspect

Dominant soils include: Bewleyville

Vegetation: southern red oak, scarlet oak, white oak, black oak, and eastern redcedar, occasional chestnut oak, bur oak, post oak, red maple, elms, hackberry, white ash, sugar maple, black walnut, black cherry, shortleaf pine, Virginia pine, and loblolly pine. Flowering dogwood, persimmon, sassafras, sourwood, eastern hophornbeam, wild plum, winged elm, and vacciniums are common in the understory.

#### Description of Landtype 21: Foothills, Terraces, and Stream bottoms With Good Drainage in Coves

Dominant soils include Etowah.

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, 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 46: Terraces and Floodplains with Good Drainage

Dominant soils include Pickwick.

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, pin oak, hackberry, sugarberry, boxelder, Shumard oak, cottonwood, black oak, northern red oak, black cherry, white ash, black walnut, yellow buckeye, honey locust, and sassafras. Dogwoods, cane, hawthorns, American hornbeam, eastern hophornbeam, American holly, vacciniums, grape, euonymuses, paw paw, bladdernut, willows, and red mulberry are common in the understory.

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): Provisional Ecological Site (PES)

Plant species dominants:

white oak (*Quercus alba*)- northern red oak / spicebush (*Lindera benzoin*) - wild hydrangea (*Hydrangea arborescens*) / bursting heart (*Euonymus americanus*)

Understory plants will likely include vacciniums, hawthorns, hydrangeas, grapes, euonymuses, Virginia creeper, bedstraws, ferns, and an array of spring wildflowers.

#### State: 2. Phase 2.1. Pasture

Plant species dominants: *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 (Abandoned) Field

Plant species dominants: maples (*Acer* spp.) - tulip poplar (*Liriodendron tulipifera*) / multiflora rose (*Rosa multiflora*) - berries (*Rubus* spp.) / tall fescue (*Schedonorus arundinaceus*)

Tree species regeneration on these sites will depend on the severity and duration of disturbance, soil characteristics, adjacent plant communities and seed sources, post-disturbance management inputs, presence or absence of continued site disturbances (grazing), slope, and aspect. Other successional tree species may include hackberry, boxelder, ashes, elms, sycamore, cottonwood, and tulip poplar.

Transitioning this state to a reference condition would require timber stand improvement practices.

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: Phase 5.1. Cropland

Phase 4.1: Plant species dominants: *Zea* spp. – *Glycine* spp.

Plants on these sites will be dependent upon seeding and management. Most common crops are corn and soybeans. Due to the drainage issues on these soil, many have been tilled extensively to facilitate crop production.

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

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**

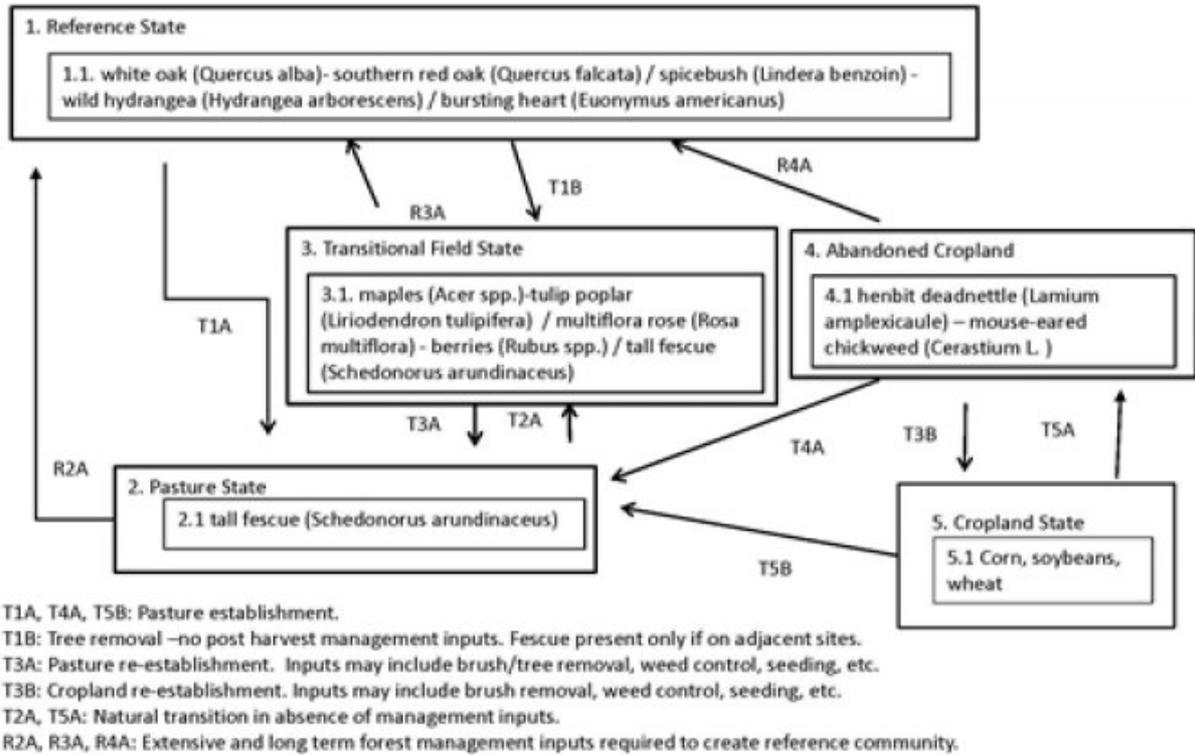


Figure 5. 27 Loamy Terraces

**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:**

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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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