USDA Natural Resources Conservation Service

Ecological site F114XA203IN
Wet Alluvium Forest

Last updated: 9/26/2024
Accessed: 05/14/2025

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): 114X–Southern Illinois and Indiana Thin Loess and Till Plain

MLRA 114 makes up about 4,550 square miles (11,795 square kilometers. The three parts of this MRLA are mostly in the Till Plains Section of the Central Lowland Province of the Interior Plains. The western third of the western part is in the Highland Rim Section of the Interior Low Plateaus Province of the Interior Plains. The eastern half of the eastern part is in the Kanawha Section of the Appalachian Plateaus Province of the Appalachian Highlands. Both large and small tributaries of the Ohio River dissect the nearly level to very steep glaciated uplands in this area. The major streams and rivers have well defined valleys with broad flood plains and numerous stream terraces. The flood plains along the smaller streams are narrow. Broad summits are nearly level to gently sloping. Elevation ranges from 320 feet (100 meters) on the southernmost flood plain along the Ohio River to 1,250 feet (380 meters) on the highest ridges. Local relief is mainly 10 to 50 feet (3 to 15 meters), but it can be 50 to 100 feet (15 to 30 meters) along drainageways and streams. Also, the Ohio River bluffs are as much as 300 feet (90 meters) above the river valley floor.

Classification relationships

USFS: 222 Eastern Broadleaf Forest (Continental) Province.

Homoya's Natural Regions of Indiana: Bluegrass Region

NatureServe: Scientific Name: North-Central Interior Floodplain, Unique Identifier: CES202.694

Ecological site concept

The Wet Alluvium Forest reference community is a mixed hardwood floodplain forest. The dominant species in the canopy were American sycamore, eastern cottonwood, silver maple, boxelder, red maple, green ash, sweetgum, and swamp white oak. An earlier successional phase of this site is comprised largely of young cottonwoods, willows, and dogwoods along with various water-tolerant herbaceous species. The natural dynamics of the site are controlled by flooding, channel meandering, sedimentation and erosion. These processes still occur, but in recent times have been greatly altered from pre-settlement conditions by agriculture, bank stabilization, dams, diversions, and channel straightening.

Associated sites

F114XA204IN	**Alluvium Forest** Alluvium Forest. These sites are better drained than the Wet Alluvium Forest group.

Table 1. Dominant plant species

Tree	(1) *Platanus occidentalis* (2) *Populus deltoides*
Shrub	(1) *Salix*
Herbaceous	(1) *Laportea* (2) *Vitis*

Physiographic features

These soils are in alluvial floodplains and subject to flooding and ponding. Sites have a high water table, especially seasonally. Soil series include Brids, Bonnie, Driftwood, Killbuck, Holton, Orrville, Piopolis, Stendal, Wakeland and Wilhite.

Future ESD development may result in this group being further split based on flooding and ponding regimes.

Table 2. Representative physiographic features

Landforms	(1) Alluvial plain > Flood plain (2) Alluvial plain > Flood-plain step
Runoff class	Negligible to low
Flooding duration	Extremely brief (0.1 to 4 hours) to brief (2 to 7 days)
Flooding frequency	Rare to frequent
Ponding duration	Very brief (4 to 48 hours) to very long (more than 30 days)
Ponding frequency	None to frequent
Elevation	104–311 m
Slope	0–2%
Ponding depth	0–38 cm
Water table depth	15–114 cm
Aspect	Aspect is not a significant factor

Climatic features

About 60 percent of the precipitation falls during the freeze-free period. Most of the rainfall occurs as high-intensity, convective thunderstorms during summer. Snowfall is common in winter. The freeze-free period averages about 180 days.

Table 3. Representative climatic features

Frost-free period (characteristic range)	153-158 days
Freeze-free period (characteristic range)	178-181 days
Precipitation total (characteristic range)	1,168-1,219 mm
Frost-free period (actual range)	153-159 days
Freeze-free period (actual range)	177-181 days
Precipitation total (actual range)	1,168-1,219 mm
Frost-free period (average)	156 days
Freeze-free period (average)	179 days
Precipitation total (average)	1,194 mm

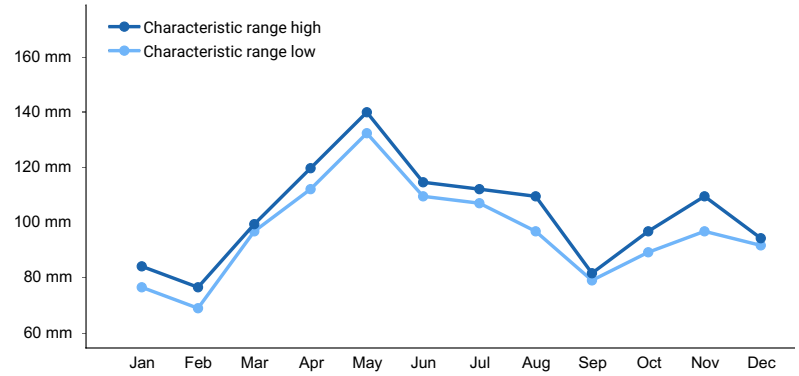


Figure 1. Monthly precipitation range

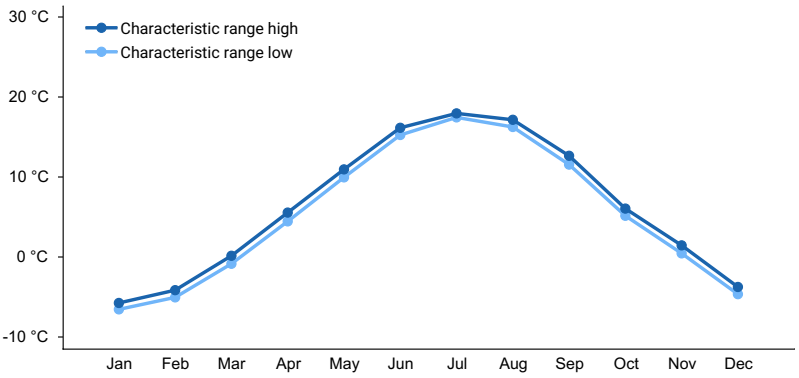


Figure 2. Monthly minimum temperature range

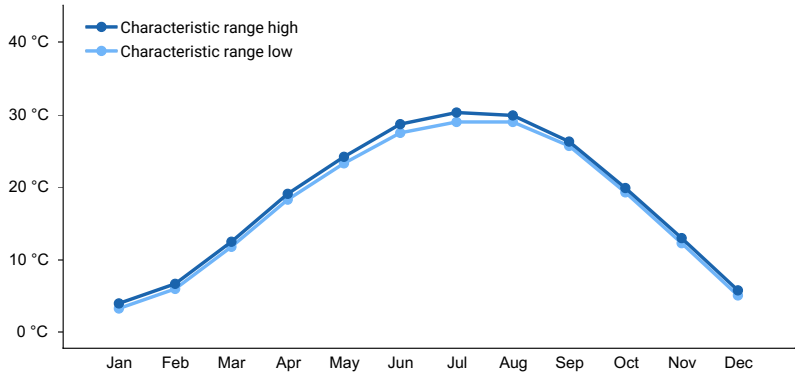


Figure 3. Monthly maximum temperature range

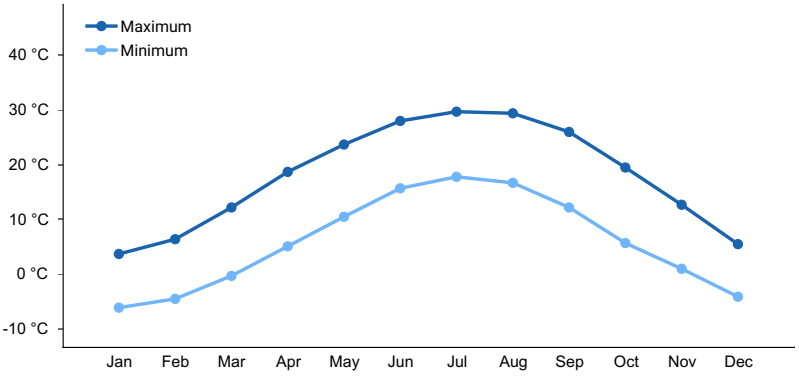


Figure 4. Monthly average minimum and maximum temperature

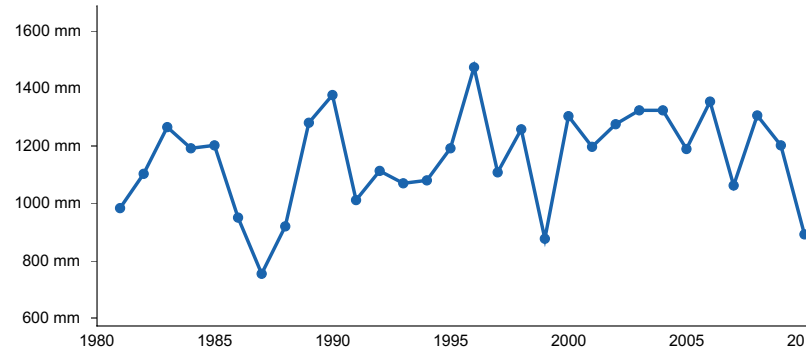


Figure 5. Annual precipitation pattern

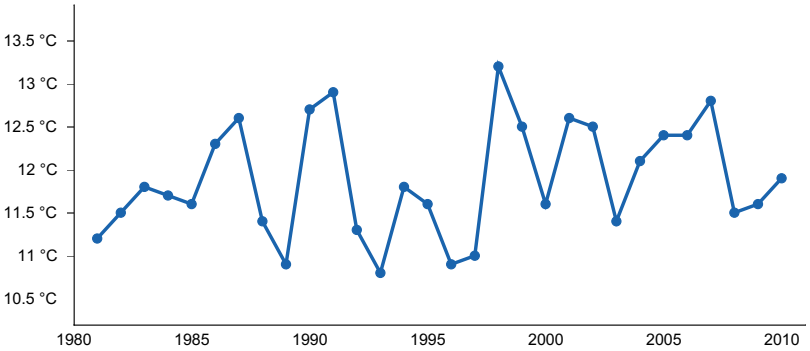


Figure 6. Annual average temperature pattern

Climate stations used

- (1) SEYMOUR 2 N [USC00127935], Seymour, IN
- (2) LEXINGTON 3N [USC00124977], Lexington, IN
- (3) NORTH VERNON 2 ESE [USC00126435], North Vernon, IN
- (4) MILFORD [USC00335268], Milford, OH

Influencing water features

These sites are routinely influenced by stream and river flooding and ponding.

The hydro-geographic model classification for this site is Riverine: alluvial plain, backswamp, floodplain, forested. This site has a Cowardin classification of PFO6An: it is a forested palustrine system that can be temporarily flooded/ponded on mineral soil.

Soil features

Soils in this group are very deep, poorly drained and very poorly drained and formed in silty alluvium on flood plains.

Table 4. Representative soil features

Parent material	(1) Alluvium
Surface texture	(1) Silt loam (2) Silty clay loam (3) Clay loam
Drainage class	Somewhat poorly drained to poorly drained
Permeability class	Slow to moderate
Depth to restrictive layer	203 cm
Soil depth	203 cm

Surface fragment cover <=3"	0%
Surface fragment cover >3"	0%
Available water capacity (Depth not specified)	19.56–23.11 cm
Soil reaction (1:1 water) (Depth not specified)	5–6.5
Subsurface fragment volume <=3" (Depth not specified)	0–1%
Subsurface fragment volume >3" (Depth not specified)	0%

Ecological dynamics

The historic plant community is a mixed hardwood floodplain forest. The dominant species in the canopy were American sycamore, eastern cottonwood, silver maple, boxelder, red maple, green ash, sweetgum, pin oak, northern red oak, and swamp white oak. An earlier successional phase of this site is comprised largely of young cottonwoods, willows, and dogwoods along with various water-tolerant herbaceous species. The early successional phase after a large disturbance event or on the vegetating of a new bank or island of the riparian area. Cover is generally very heavy, but usually not more than 10 feet tall.

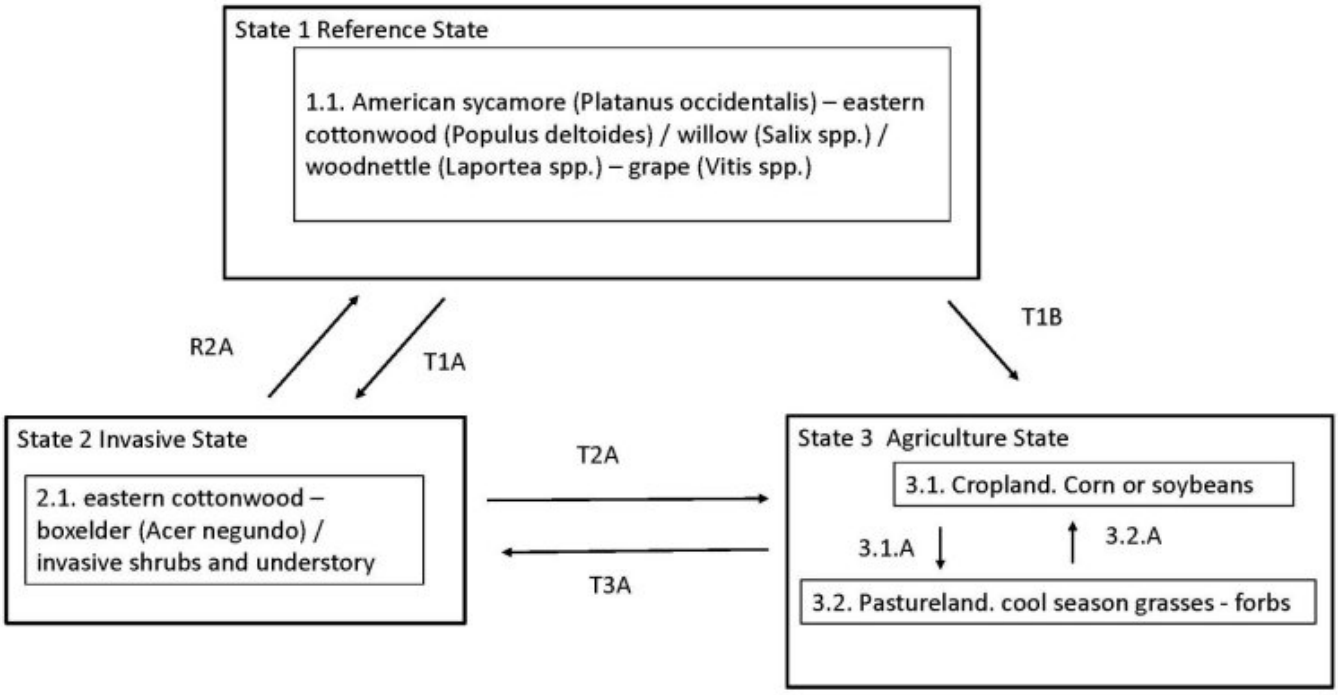
Common understory plants include small spike false nettle (*Boehmeria cylindrica*), Canadian woodnettle (*Laportea canadensis*), sedges (Carex spp.), spikerush (Eleocharis spp.), Virginia dayflower (*Commelina virginica*), green dragon (*Arisaema dracontium*), Canadian clearweed (*Pilea pumila*), indian wood oats (*Chasmanthium latifolium*) and numerous moisture loving herbs. Common vines on these sites include grape (Vitis spp.), greenbrier (Smilax spp.) poison ivy (*Toxicodendron radicans*) and trumpet creeper (*Campsis radicans*).

The natural dynamics of the site are controlled by flooding, channel meandering, sedimentation and erosion. These processes still occur, but in recent times have been greatly altered from pre-settlement conditions by agriculture, bank stabilization, dams, diversions, and channel straightening.

The major influence on these sites is the frequency, length, and depth of flooding. The hydrological regime is generally one of frequent low-intensity flooding events that influence the shrub and understory layer to a larger degree than the overstory. These regular, short-term floods and periodically punctuated by long-term, high-intensity flooding events every 100-200 years that can alter overstory composition and allow new space for successional states to develop.

Most of these sites have been greatly altered, both vegetatively (clearing, grazing, selective harvesting) and hydrologically (tiling, ditching). Few sites remain that have not been impacted by farming, urban development, or large-scale watershed modifications such as levees and dams.

State and transition model



State 1
Wet Alluvium Forest

The reference plant community is a mixed hardwood floodplain forest. The dominant species in the canopy are American sycamore, eastern cottonwood, silver maple, boxelder, red maple, green ash, sweetgum, and swamp white oak. An earlier successional phase of this site is comprised largely of young cottonwoods, willows, and dogwoods. The understory consists of water-tolerant herbaceous species.

Dominant plant species

- American sycamore (*Platanus occidentalis*), tree
- eastern cottonwood (*Populus deltoides*), tree
- silver maple (*Acer saccharinum*), tree
- oak (*Quercus*), tree
- green ash (*Fraxinus pennsylvanica*), tree
- willow (*Salix*), shrub
- pawpaw (*Asimina triloba*), shrub
- sedge (*Carex*), grass
- Canadian woodnettle (*Laportea canadensis*), other herbaceous
- grape (*Vitis*), other herbaceous
- Canadian clearweed (*Pilea pumila*), other herbaceous

Community 1.1
Hardwood Forest

Numerous water-tolerant species may be found on these sites including sycamore, cottonwood, willow, boxelder, silver maple, green ash, swamp white oak, dogwoods and elm.

Dominant plant species

- American sycamore (*Platanus occidentalis*), tree
- eastern cottonwood (*Populus deltoides*), tree
- silver maple (*Acer saccharinum*), tree
- oak (*Quercus*), tree
- green ash (*Fraxinus pennsylvanica*), tree
- willow (*Salix*), shrub
- pawpaw (*Asimina triloba*), shrub
- sedge (*Carex*), grass
- Canadian woodnettle (*Laportea canadensis*), other herbaceous
- grape (*Vitis*), other herbaceous
- Canadian clearweed (*Pilea pumila*), other herbaceous

State 2
Disturbed -Invaded State

This state is characterized by non-native species which, if left unchecked, can alter the plant composition of the natural community.

Dominant plant species

- maple (*Acer*), tree
- cottonwood (*Populus*), tree
- ash (*Fraxinus*), tree
- honeysuckle (*Lonicera*), shrub
- Nepalese browntop (*Microstegium vimineum*), grass
- garlic mustard (*Alliaria petiolata*), other herbaceous
- Japanese honeysuckle (*Lonicera japonica*), other herbaceous

Community 2.1
Disturbed - Invaded Community

Post disturbance, a number of species may be introduced to these sites. Fast growing tree such as maple, ash, and poplar are often found on these sites.

Dominant plant species

- maple (*Acer*), tree
- cottonwood (*Populus*), tree
- ash (*Fraxinus*), tree
- Amur honeysuckle (*Lonicera maackii*), shrub
- Nepalese browntop (*Microstegium vimineum*), grass
- garlic mustard (*Alliaria petiolata*), other herbaceous
- Japanese honeysuckle (*Lonicera japonica*), other herbaceous

State 3
Agricultural State

Most common agricultural row crop on these sites is a corn-soybean rotation. Other grains may be planted depending on management goals. A small percentage of the historic acres are used for forage and pasture. Most sites have had hydrological modifications installed such as tiling and ditching.

Dominant plant species

- tall fescue (*Schedonorus arundinaceus*), grass

- brome (*Bromus*), grass
- Kentucky bluegrass (*Poa pratensis*), grass
- red clover (*Trifolium pratense*), other herbaceous
- white clover (*Trifolium repens*), other herbaceous
- corn (*Zea mays*), other herbaceous
- soybean (*Glycine max*), other herbaceous

Community 3.1
Cropland

Most common practice is a corn and soybean rotation of various types. Most sites have had hydrological modifications installed such as tiling and ditching.

Dominant plant species

- corn (*Zea mays*), other herbaceous
- soybean (*Glycine max*), other herbaceous

Community 3.2
Pastureland

A small percentage of the historic acres are used for forage and pasture. Sites may have hydrological modifications installed such as tiling and ditching. Species vary depending on management goals and objectives.

Dominant plant species

- tall fescue (*Schedonorus arundinaceus*), grass
- brome (*Bromus*), grass
- Kentucky bluegrass (*Poa pratensis*), grass
- red clover (*Trifolium pratense*), other herbaceous
- white clover (*Trifolium repens*), other herbaceous

Pathway 3.1
Community 3.1 to 3.2

Management inputs (seeding, weed control) are required to transition the cropland community to pastureland. Many grasses and forbs may be planted depending on the landowner's goals and objectives.

Pathway 3.2
Community 3.2 to 3.1

Management inputs are required to transition a pasture to a row crop field. Multiple crops may be grown and species selected will depend on the landowner's goals and objectives.

Transition T1A
State 1 to 2

This transition is driven by disturbance (clearning, oak removal, hydrological modification, etc.) and the invasion of non-native plants into the natural system. Left uncontrolled, the ecological viability and species diversity of the site will likely be compromised. Management control of brush and weeds is recommended.

Transition T1B
State 1 to 3

Clearing of forest. Brush removal. Site preparation and plantings. Management activities will depend upon goals and objectives of the landowner. Landowners should seek out assistance in evaluating wetland issues potentially associated with these sites to insure compliance with federal wetland regulations.

Restoration pathway R2A
State 2 to 1

Management activities to reduce and control invasive plant species. Planting of desired species. Long-term forest management activities.

Transition T2B
State 2 to 3

Clearing of forest. Brush removal. Site preparation and plantings. Weed and brush management. Management activities will depend upon goals and objectives of the landowner. Landowners should seek out assistance in evaluating wetland issues potentially associated with these sites to insure compliance with federal wetland regulations.

Restoration pathway T3A
State 3 to 2

A site that is abandoned will revert to a mix of fast growing trees. Species will depend upon seed sources, but common to these disturbed sites are maples, ashes, and poplar. Disturbances such as selective harvest, clearing, and grazing may result in the introduction of non-native vegetation.

Additional community tables

Inventory data references

No field monitoring was conducted as part of this PES development. Future ESD development may result in plant community edits, soil mapunits being added or removed from this grouping, and/or additions or modifications to the narratives, tables, vegetation descriptions and state and transition model.

Other references

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Approval

Greg Schmidt, 9/26/2024

Acknowledgments

PES documents developed for adjacent MLRAs in Indiana and Ohio served as a source of information as these MLRAs often shared similar soil series with MLRA 114A. NRCS county soil surveys where a valuable reference including tree species observed on site by NRCS staff. Soil Survey and NRCS Indiana resource soil scientists contributed field observation, field notes, and extensive soil mapping expertise.

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)	A Arends, ESI Specialist
Contact for lead author	
Date	05/14/2025
Approved by	Greg Schmidt
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:**

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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:**
