USDA Natural Resources Conservation Service

Ecological site F111XE204OH
Dry Alluvium Forest

Last updated: 5/28/2020
Accessed: 05/04/2024

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): 111X–Indiana and Ohio Till Plain

111E – Indiana and Ohio Till Plain, Eastern Part. Most of this area is in the Till Plains Section of the Central Lowlands Province of the Interior Plains. The northeast tip of the area is in the Southern New York Section of the Appalachian Highlands. The entire area has been glaciated. It is dominated by ground moraines that are broken in places by kames, lake plains, outwash plains, terraces, and stream valleys. Narrow, shallow valleys commonly are along the few large streams in the area. Elevation ranges from 580 to 1,400 feet (175 to 425 meters), increasing gradually from west to east. Relief is mainly a few meters, but in some areas hills rise as much as 100 feet (30 meters) above the adjoining plain.

The extent of the major Hydrologic Unit Areas (identified by four-digit numbers) that make up this MLRA is as follows: Scioto (0506), 33 percent; Muskingum (0504), 31 percent; and Western Lake Erie (0410), 28 percent; Upper Ohio (0503), 5 percent; and Southern Lake Erie (0411), 3 percent. The headwaters of many rivers in central Ohio, including the Vermillion, Black Fork, Sandusky, Little Scioto, and Olentangy Rivers, are in this MLRA.

This MLRA is underlain by late Devonian shale and sandstone. Surficial materials include glacial deposits of till, glaciolacustrine sediments, and outwash from Wisconsin and older glacial periods.

Classification relationships

Major Land Resource Area (USDA-Natural Resources Conservation Service, 2006)

USFS Ecological Regions (USDA, 2007):
Sections –Central Till Plains, Beech Maple (222H), Western Glaciated Allegheny Plateau (221F)

Subsections – Allegheny Plateau (221Fa), Bluffton Till Plains (222Ha), Miami-Scioto Plain – Tipton Till Plain (222Hb)

NatureServe Systems anticipated (NatureServe, 2011): Agriculture - Cultivated Crops and Irrigated Agriculture, Agriculture – Pasture/Hay, North-Central Interior Floodplain

LANDFIRE Biophysical Settings anticipated (USGS, 2010): Central Interior and Appalachian Floodplain Systems

Ecological site concept

This site is a wetland/riparian site formed on soils with alluvial parent materials that are moderately well to well drained that a have a light (lighter than 3/2 Munsell) surface color. It is located along the floodplain, often on steps, natural levees, and terraces, of lotic systems in sandy alluvial deposits overlaying coarser materials. The site is generally constrained to a narrow landscape position that is influenced by the adjacent uplands and riparian areas. Flooding can be very rare to frequent, depending on the riparian system with durations up to 7 days. Landscape

position and internal drainage preclude ponding from occurring on this site.

The characteristic vegetation of the site is that of a riparian forest dominated principally by sugar maple and basswood. Additional canopy level species include black walnut, silver maple, and elm. Active hydrologic and geomorphic process, along with windthrow of established trees, drive the long interval disturbance regime of this tree dominated site. These macro and micro scale disturbance events creates mixed-aged forests that contains both late and early seral species. These dynamics have been drastically changed due to the installation of levees, dams, and channelization of the system. Establishment woody non-native, invasive species, followed by no management to control them, can alter the state of the site. The invasive species can persist in the understory as a component and then spread rapidly with an opening in the canopy. They can come to dominate the understory of the site, while the canopy level species remain, relatively, unchanged. Removal of the woody species, installation of tile, and agricultural practices move this site to a new state. Much of the historic acres of this site have been transitioned to agriculture with the bulk of those acres being in corn and soybean rotations.

Associated sites

F111XE201OH	**Wet Alluvium Floodplain** Soils are very poorly drained; surface dark in color (mollic)
F111XE202OH	**Dry Alluvium Floodplain** Soils are moderately well to well drained; surface dark in color (mollic)
F111XE203OH	**Wet Alluvium Forest** Soils are poorly to somewhat poorly drained

Similar sites

F111XE102OH	**Lacustrine Forest** Located on lacustrine parent materials; soils are somewhat poorly drained or drier.
F111XE301OH	**Wet Restricted** Located on residuum parent materials; soils are somewhat poorly drained; soils have a restrictive layer within 36 inches of the surface.
F111XE403OH	**Outwash Upland** Located on outwash parent materials; soils are very poorly to somewhat poorly drained.
F111XE502OH	**Wet Till Ridge** Located on glacial till parent materials; site located on a convex landscape position; soils are somewhat poorly drained.
F111XE503OH	**Till Ridge** Located on glacial till parent materials; site located on a convex landscape position; soils are moderately well to well drained.

Table 1. Dominant plant species

Tree	(1) *Acer saccharum* (2) *Tilia americana*
Shrub	Not specified
Herbaceous	Not specified

Physiographic features

This site is located in the 111E - Indiana and Ohio Till Plain, Eastern Part MLRA. It is classified as a wetland/riparian site. This site was formed in loamy alluvium on natural levees, low terraces, and bars on flood plains. This creates a long, linear expression of the site on the landscape with slopes ranging from 0 to 2 percent. Attribute Minimum Maximum

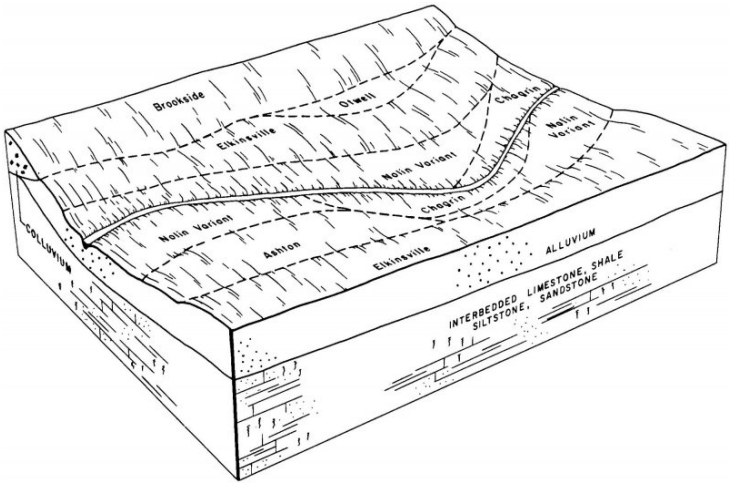

Figure 1. block diagram showing soils on landscape

Table 2. Representative physiographic features

Landforms	(1) Valley > Flood plain
Flooding duration	Extremely brief (0.1 to 4 hours) to brief (2 to 7 days)
Flooding frequency	Very rare to frequent
Ponding frequency	None
Elevation	90–549 m
Slope	0–2%
Water table depth	46–152 cm
Aspect	Aspect is not a significant factor

Climatic features

The average annual precipitation in this area is 35 to 41 (890 to 1,040 millimeters). Most of the rainfall occurs as convective thunderstorms during the growing season. About half or more of the precipitation occurs during the freeze-free period. Snowfall is common in winter. The average annual temperature is 48 to 52 degrees F (9 to 11 degrees C). The freeze-free period averages about 185 days and ranges from 165 to 205 days.

Table 3. Representative climatic features

Frost-free period (characteristic range)	136-147 days
Freeze-free period (characteristic range)	171-182 days
Precipitation total (characteristic range)	991-1,041 mm
Frost-free period (actual range)	133-149 days
Freeze-free period (actual range)	167-183 days
Precipitation total (actual range)	965-1,067 mm
Frost-free period (average)	142 days
Freeze-free period (average)	176 days
Precipitation total (average)	1,016 mm

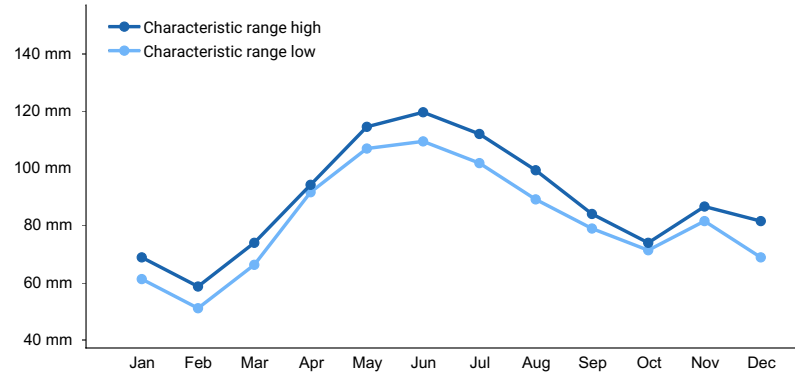

Figure 2. Monthly precipitation range

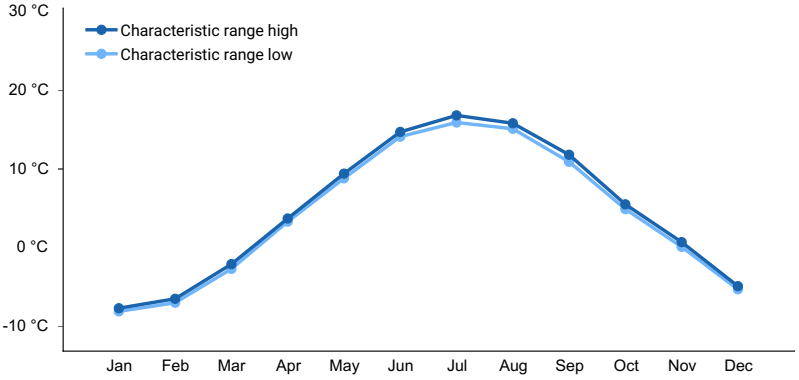

Figure 3. Monthly minimum temperature range

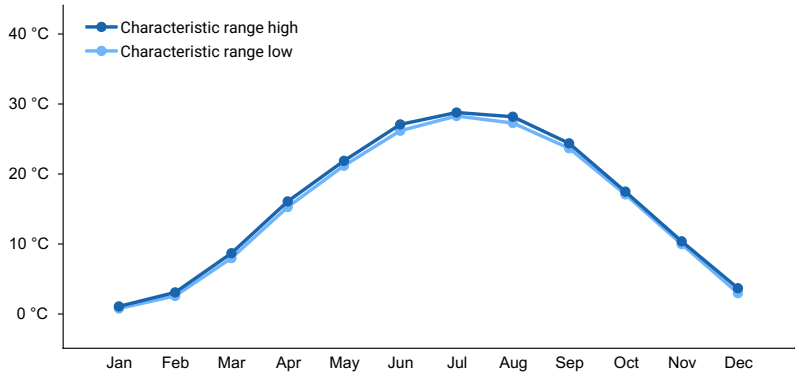

Figure 4. Monthly maximum temperature range

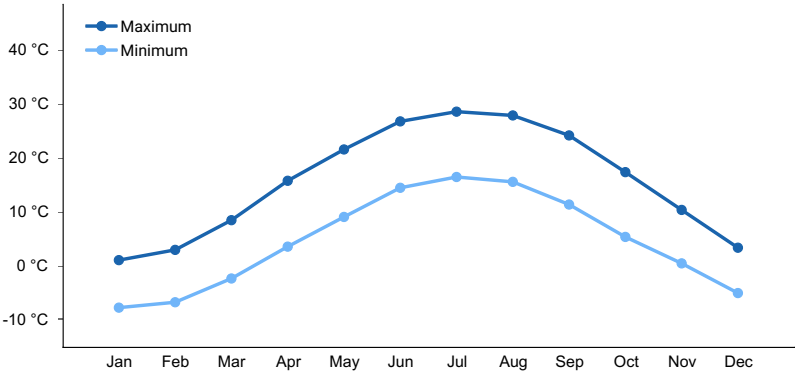

Figure 5. Monthly average minimum and maximum temperature

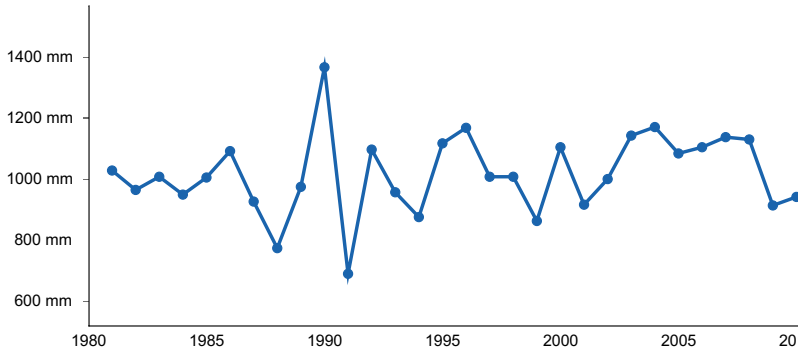

Figure 6. Annual precipitation pattern

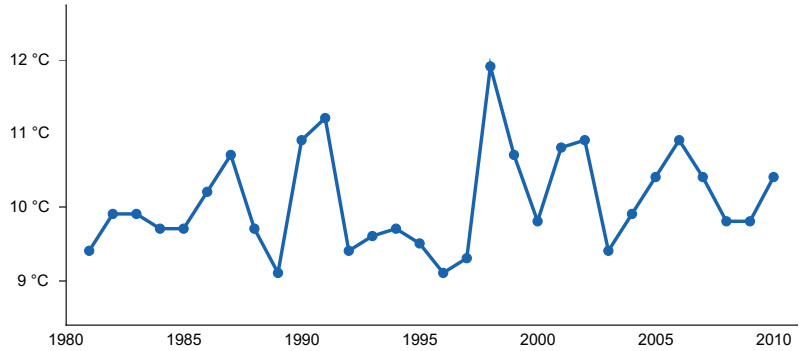

Figure 7. Annual average temperature pattern

Climate stations used

- (1) ASHLAND 2 SW [USC00330256], Ashland, OH
- (2) CENTERBURG 2 SE [USC00331404], Centerburg, OH
- (3) GALION WTR WKS [USC00333021], Galion, OH
- (4) NORWALK WWTP [USC00336118], Norwalk, OH

Influencing water features

This site is characterized by its location in a floodplain of a perennial stream and therefore is most affected by the flooding, scouring, and channel movement of the adjacent lotic system. Flooding can be very rare to frequent with a brief (2 to 7 day) duration depending on the riverine system. Ponding does not occur on the site largely due to drainage of the soil, but also due to landform position. The proximity of the site to a perennial stream/river and therefore low topographic location result in a seasonally high water table in the spring that recedes during the summer. Levees, dams, and channelization have greatly altered the hydrology and flooding of the riparian systems in many places.

The hydrogeographic model classification for this site is RIVERINE: Alluvial Plain, Stream Terrace, Flood Plain; forested. This site has a Cowardin Classification of PFO6An; it is a forested palustrine system that is temporarily flooded on mineral soil.

Soil features

Representative Soil Features
The soil series associated with this site are: Tioga, Lobdell, Lindside, Genesee, and Chagrin. They are very deep, moderately well drained to well drained, and moderate to rapid permeable soils, with slightly acidic to neutral soil reaction, that formed in alluvium.

Parent Materials Kind: alluvium
Surface Texture: loam, silt loam
Subsurface Texture group: loamy

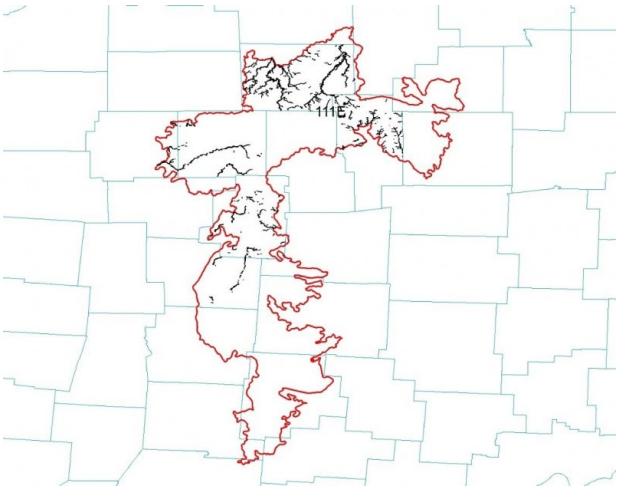

Figure 8. location of mapunits in the MLRA

Table 4. Representative soil features

Parent material	(1) Alluvium
Surface texture	(1) Loam (2) Silt loam
Drainage class	Moderately well drained to well drained
Permeability class	Moderate to rapid
Soil depth	203 cm
Surface fragment cover <=3"	0%
Surface fragment cover >3"	0%
Available water capacity (Depth not specified)	13.72–20.57 cm
Calcium carbonate equivalent (Depth not specified)	0–5%
Electrical conductivity (Depth not specified)	0 mmhos/cm
Sodium adsorption ratio (Depth not specified)	0
Soil reaction (1:1 water) (Depth not specified)	6.2–7
Subsurface fragment volume <=3" (Depth not specified)	2–8%
Subsurface fragment volume >3" (Depth not specified)	2–3%

Ecological dynamics

The historic plant community of the Dry Alluvium Forest ecological site is an alluvium riparian forest. The dominant species in the canopy are sugar maple and basswood, with black walnut, silver maple, and elm being common as well. This site is the result of hydrologic and geomorphic process at the macro scale and windthrow on a more local scale. The disturbance regime is one of somewhat frequent low intensity flooding events punctuated by high intensity events (ie. 100+ year floods, tornados, or ice storms). Micro scale disturbance such as windthrow or localized mortality lead the site to being a mixed-age forest.

State and transition model

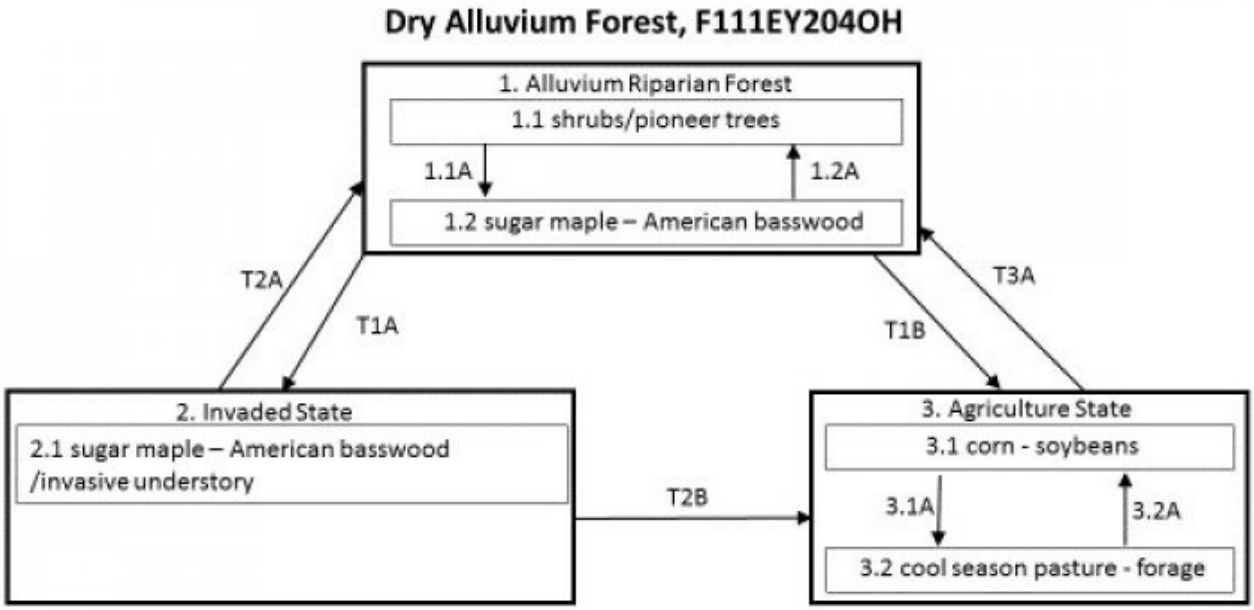

Figure 9. STM

Dry Alluvium Forest, F111EY204OH

Diagram Legend

T1A	Invasive species establishment, no management
T1B	Remove woody species, drainage (if needed), site preparation, planting
T2A	Chemical/mechanical treatment of invasive species, timber stand improvements practices
T2B	Remove woody species, drainage (if needed), site preparation, planting
T3A	Drainage removal (if needed), planting, timber stand improvement practices
1.1A	Succession
1.2A	Disturbance that removes canopy trees
3.1A	Pasture/forage planting and management
3.2A	Conventional/no-till planting and management of row crops

Figure 10. Legend

State 1
Alluvium Riparian Forest

This is the diagnostic plant community for this site. In reference condition, this site was dominated by sugar maple, basswood, and black walnut. An earlier successional phase of this site is comprised largely of shrubs and pioneering species. Stand replacing events were very uncommon. Small gap disturbance was the most common disturbance event that allowed propagation of these species.

Dominant plant species

- sugar maple (*Acer saccharum*), tree
- American basswood (*Tilia americana*), tree
- black walnut (*Juglans nigra*), tree

Community 1.1
shrubs/ pioneer trees

This phase in characterized by pioneering woody species that respond rapidly to increased light availability. Cover is generally very heavy, but not usually very tall. As time and succession progress, the trees become larger and less dense.

Community 1.2
sugar maple - American basswood

This phase in characterized by tree dominance, particularly sugar maple, basswood, and tulip-tree. Additional canopy species include black walnut, silver maple, and elm.

Dominant plant species

- sugar maple (*Acer saccharum*), tree
- American basswood (*Tilia americana*), tree

Pathway P1.1A
Community 1.1 to 1.2

Time and succession will move the site from this phase to the full expression of Community Phase 1.2

Pathway P1.2A
Community 1.2 to 1.1

Disturbance, whether natural or as management, that removes a large portion of the trees will move the site towards phase 1.

State 2
Invaded State

This state is characterized by the establishment and eventual dominance of invasive species in the understory. This greatly reduces the species richness and diversity of the site as a whole. Common invasives for this site include, but are not limited to, species of Asian bush honeysuckle, Callery pear, autumn olive and ailanthus.

Dominant plant species

- sugar maple (*Acer saccharum*), tree
- American basswood (*Tilia americana*), tree
- tree of heaven (*Ailanthus altissima*), tree
- Callery pear (*Pyrus calleryana*), tree
- honeysuckle (*Lonicera*), shrub
- autumn olive (*Elaeagnus umbellata*), shrub

Community 2.1
sugar maple - American basswood

This phase is characterized by the understory being dominated by woody, mostly non-native, invasive species.

Dominant plant species

- sugar maple (*Acer saccharum*), tree

- American basswood (*Tilia americana*), tree
- honeysuckle (*Lonicera*), shrub
- autumn olive (*Elaeagnus umbellata*), shrub

State 3
Agricultural State

This state is characterized by the conversion of the site to agricultural use. Most common practice is a corn and soybean rotation of various types. A small portion of the historic acres are used for forage and pasture.

Community 3.1
Corn - soybeans

This phase is characterized by row crop agriculture of small grains, primarily corn and soybeans.

Community 3.2
cool season forage - pasture

This phase is characterized by forage or grazing agriculture. Different mixes of, generally, cool season grasses and forbs, largely clovers, are grown.

Pathway P3.1A
Community 3.1 to 3.2

Planting of cool season pasture/forage species and management to maintain them.

Pathway P3.2A
Community 3.2 to 3.1

Planting, either by conventional or no-till methods, of row crops. Management that keeps the site in row crop production

Transition T1A
State 1 to 2

Establishment of invasive species with not management to control them will move the site towards the Invaded State.

Transition T1B
State 1 to 3

The site is converted to the Agriculture State (#3) after the woody species are removed, the crops planted, and implementation of agricultural practices. For this site, cool season forage and pasture is more common than row crop agriculture.

Restoration pathway R2A
State 2 to 1

Chemical and mechanical treatment of the invasive species. Planting of desired species may be needed if they are not enough left to recolonize the site.

Transition T2B
State 2 to 3

Removal of trees and other woody species. Install drainage system (if warranted), prepare the site for planting the agricultural crop, and regular agricultural practices.

Restoration pathway R3A
State 3 to 1

Removal of drainage system (if warranted), site preparation, and tree planting.

Additional community tables

Inventory data references

Site concept developed through expert opinion, review of the literature, and field work.

Other references

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Approval

Chris Tecklenburg, 5/28/2020

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)	TYLER STAGGS
Contact for lead author	
Date	05/04/2024
Approved by	Chris Tecklenburg
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):**

8. **Soil surface (top few mm) resistance to erosion (stability values are averages - most sites will show a range of values):**

9. **Soil surface structure and SOM content (include type of structure and A-horizon color and thickness):**

10. **Effect of community phase composition (relative proportion of different functional groups) and spatial distribution on infiltration and runoff:**

11. **Presence and thickness of compaction layer (usually none; describe soil profile features which may be mistaken for compaction on this site):**

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:

13. **Amount of plant mortality and decadence (include which functional groups are expected to show mortality or decadence):**

14. **Average percent litter cover (%) and depth (in):**

15. **Expected annual annual-production (this is TOTAL above-ground annual-production, not just forage annual-production):**

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:**

17. **Perennial plant reproductive capability:**