USDA Natural Resources Conservation Service

Ecological site F131BY002AR
Sandy Flood Plain

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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): 131B–Arkansas River Alluvium

Major Land Resource Area (MLRA) 131B, the Arkansas River Alluvium, is in Arkansas (67 percent) and Louisiana (33 percent). It makes up about 3,955 square miles. The towns of Montrose, Dumas, and England, Arkansas, and Monroe, Louisiana, are in this MLRA. Interstate 20 passes through Monroe, Louisiana. Most parts of the Overflow National Wildlife Refuge, the Upper Ouachita National Wildlife Refuge, and the D'Arbonne National Wildlife Area are in this MLRA.

Classification relationships

USDA-Natural Resources Conservation Service, 2006.
-Major Land Resource Area (MLRA) 131B

Ecological site concept

The Sandy Floodplain is a rapidly-changing ecological site adjacent to streams and rivers. The sandy point bars and splays are influenced by flooding and the meandering water currents. Vegetative species change as flooding adds and removes sediments.

Associated sites

F131BY004AR	**Clay Cap Flood Plain** Sites on similar landforms, but have clay surface textures over loamy subsurface textures.

F131BY006AR	**Clayey Flood Plain** Landforms are similar, but have clayey-textured soils.
F131BY003AR	**Loamy Flood Plain** Sites on same landform, but have loamy textures.

Similar sites

F131CY001LA	**Sandy Flood Plain** Site is very similar, except in different MLRA.

Table 1. Dominant plant species

Tree	(1) *Salix nigra* (2) *Populus deltoides*
Shrub	(1) *Cephalanthus occidentalis*
Herbaceous	(1) *Saururus cernuus*

Physiographic features

This site occurs on level to gently sloping and recent, sparsely vegetated point bar deposits on floodplains. They flood rarely to frequently and have little to very low runoff.

Table 2. Representative physiographic features

Landforms	(1) Alluvial plain > Flood plain (2) Alluvial plain > Point bar
Runoff class	Negligible to low
Flooding duration	Very brief (4 to 48 hours) to brief (2 to 7 days)
Flooding frequency	Rare to frequent
Ponding frequency	None
Elevation	49–223 ft
Slope	0–5%
Water table depth	42–80 in
Aspect	Aspect is not a significant factor

Climatic features

The average annual precipitation is 56 inches, which increases from north to south. Most of the rainfall occurs as frontal storms during late fall, winter, and early spring, although an appreciable amount of precipitation also occurs as convective thunderstorms during the early part of the growing season. The total amount of the precipitation that occurs as snow

ranges from less than one percent in the southern part of the MLRA to five percent in the northern part. Temperatures range from highs in the low 90's during the summer to lows in the low 30's during the winter. The frost-free period averages 222 days, while the freeze-free period averages 256 days.

Table 3. Representative climatic features

Frost-free period (average)	222 days
Freeze-free period (average)	256 days
Precipitation total (average)	56 in

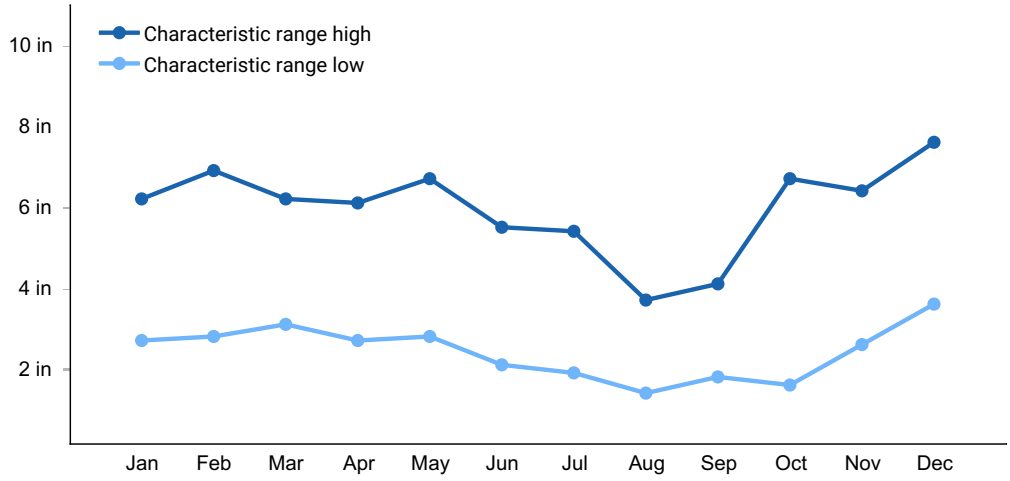


Figure 1. Monthly precipitation range

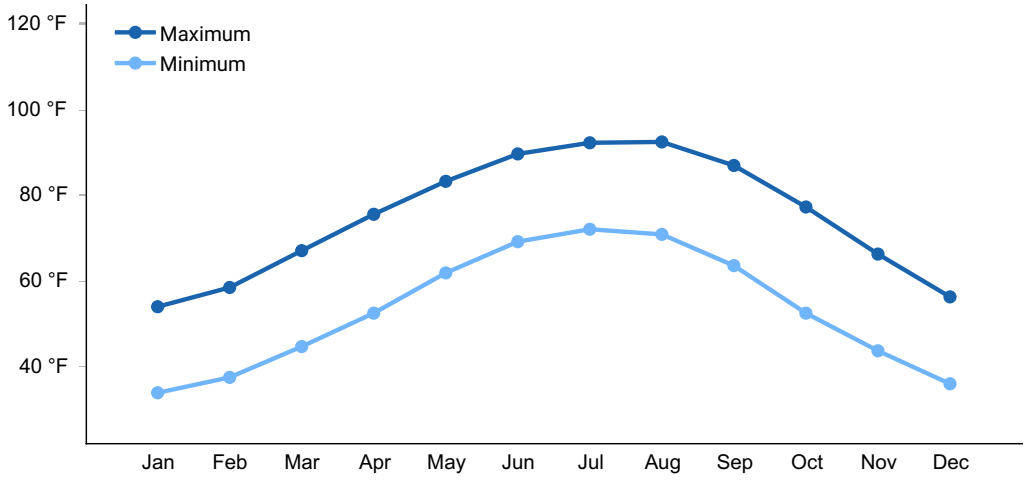


Figure 2. Monthly average minimum and maximum temperature

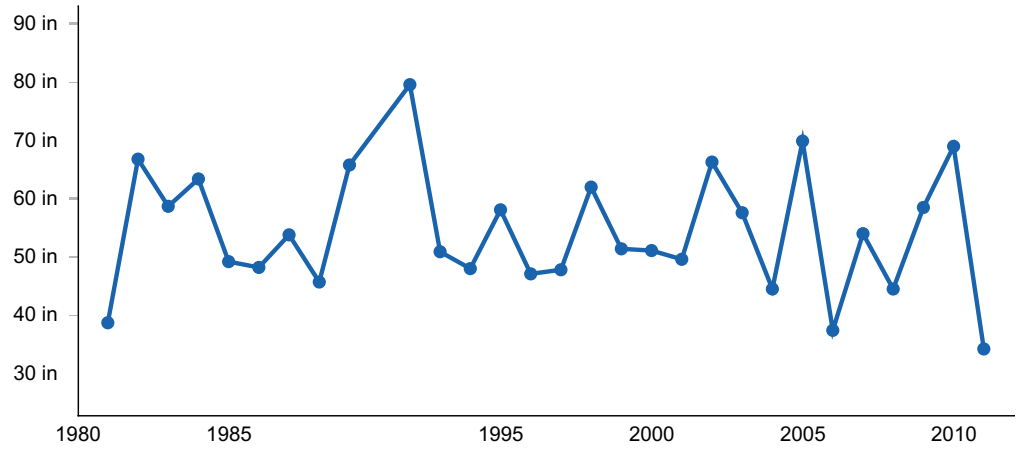


Figure 3. Annual precipitation pattern

Climate stations used

- (1) DUMAS [USC00032148], Dumas, AR
- (2) BASTROP [USC00160537], Bastrop, LA
- (3) RAYVILLE [USC00167691], Rayville, LA
- (4) MONROE RGNL AP [USW00013942], Monroe, LA
- (5) DERMOTT 3 NE [USC00031962], Dermott, AR
- (6) KEO [USC00033862], England, AR
- (7) ROHWER 2 NNE [USC00036253], Pickens, AR
- (8) PORTLAND [USC00035866], Portland, AR
- (9) COLUMBIA LOCK [USC00161979], Columbia, LA
- (10) MONROE ULM [USC00166314], Monroe, LA

Influencing water features

Sites have a rare to frequent flooding regime and a high water table through parts of the year.

Wetland description

The soil included within this site is considered hydric. An on site wetland determination are recommended to determine local conditions.

Soil features

Crevasse is the only soil correlated to the ecological site. The Crevasse series consists of very deep, excessively drained, rapidly permeable soils that formed in sandy alluvium. The taxonomic classification is mixed, thermic Typic Udipsamment. Very little horizon development exists and all are sandy throughout the entire profile.

Table 4. Representative soil features

Parent material	(1) Alluvium–igneous and sedimentary rock
Surface texture	(1) Loamy fine sand
Family particle size	(1) Sandy
Drainage class	Excessively drained
Permeability class	Moderately rapid to rapid
Soil depth	80 in
Surface fragment cover <=3"	0%
Surface fragment cover >3"	0%
Available water capacity (0-40in)	2–4 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)	5.6–8.4
Subsurface fragment volume <=3" (Depth not specified)	0–2%
Subsurface fragment volume >3" (Depth not specified)	0%

Ecological dynamics

The information in this ecological site description (ESD), including the state-and-transition model (STM), was developed using archeological and historical data, professional experience, and scientific studies. The information is representative of a complex set of plant communities. Not all scenarios or plants are included. Key indicator plants, animals, and ecological processes are described to inform land management decisions.

Introduction - This Arkansas River Alluvium (MLRA 131B) is on the alluvial plains along the lower Arkansas River in Arkansas and the Ouachita River in Louisiana and Arkansas. The landforms in the area are level or depressional to very gently undulating alluvial plains, backswamps, oxbows, natural levees, and terraces. Landform shapes range from convex on natural levees and undulating terraces, to concave in oxbows. Landform shapes differentiate water-shedding positions from water-receiving positions, both of which affect soil formation and hydrology. Average elevations start at about 50 feet in the southern part of the area and gradually rise to about 250 feet in the northwestern part. Maximum local

relief is about 10 feet, but relief is considerably lower in most of the area.

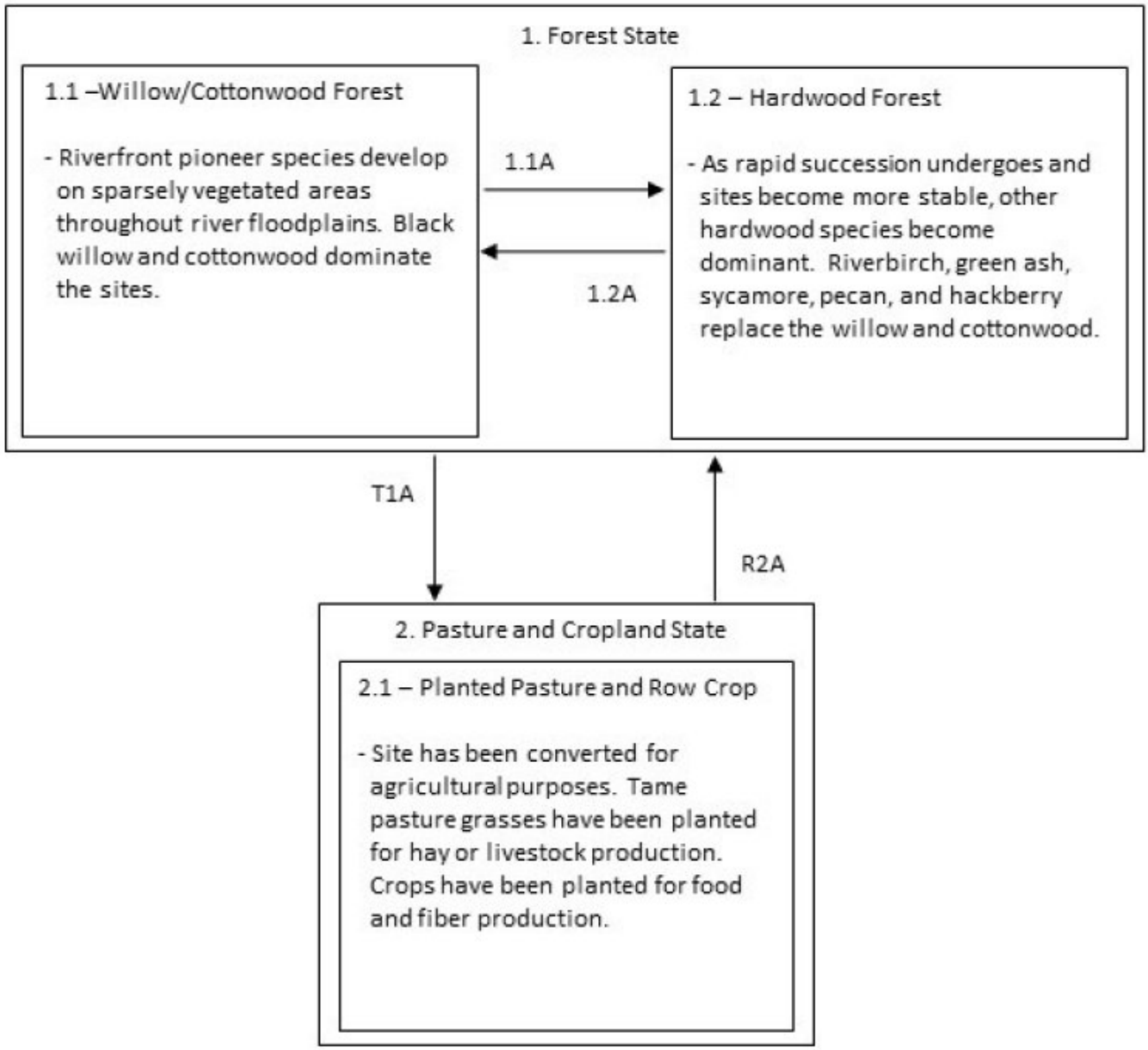
Geology - Bedrock in this area consists of Tertiary and Cretaceous sands formed as beach deposits during the retreat of the Cretaceous ocean from the midsection of the United States. Alluvial deposits from flooding and lateral migration of the Arkansas and Ouachita Rivers typically lie above the bedrock. These sediments are sandy to clayey fluvial deposits of Holocene to late Pleistocene age and are many feet thick. The geologic surfaces are identified as the Arkansas Lowlands, which extend from the Yazoo Basin up the Arkansas River to the margin of the Coastal Plain, and the parts of the Tensas Basin west of Macon Ridge. The deposits on both of these surfaces are of Holocene age. In some areas late Pleistocene terrace deposits are within several feet of the present surfaces, but they do not crop out in the MLRA.

Biological Resources - This area once consisted entirely of bottomland hardwood deciduous forest and mixed hardwood and cypress swamps pocked with areas of prairies on the terraces. The major tree species in the native plant communities in the areas of bottomland hardwoods formerly were and currently are water oak (*Quercus nigra*), Nuttall oak (*Quercus texana*), cherrybark oak (*Quercus pagoda*), pecan (Carya illinoensis), red maple (*Acer rubrum*), sweetgum (*Liquidambar styraciflua*), eastern cottonwood (*Populus deltoides*), and hickory (Carya sp.). The major tree species in the native plant communities in the swamps formerly were and currently are bald cypress (*Taxodium distichum*), water tupelo (*Nyssa aquatica*), green ash (*Fraxinus pennsylvanica*), and black willow (*Salix nigra*). The important native understory species are palmetto (*Sabal minor*), greenbrier (Smilax sp.), wild grape (Vitis sp.), and poison ivy (*Toxicodendron radicans*) in the areas of bottomland hardwoods and buttonbush (*Cephalanthus occidentalis*), lizardtail (*Saururus cernuus*), waterlily (Nymphaea sp.), sedges (Carex sp.), and rushes (Juncus sp.) in the swamps. Switchgrass (*Panicum virgatum*), big bluestem (*Andropogon gerardii*), little bluesetm (*Schizachyrium scoparium*), Indiangrass (*Sorghastrum nutans*), and eastern gamagrass (*Tripsacum dactyloides*) vegetate the prairie terraces.

Land Use - Migratory waterfowl are harvested throughout the area. Hardwood timber is harvested on some forested wetlands, and most forested areas are managed for wildlife.

Conservation - The major resource concerns are control of surface water, management of soil moisture, and maintenance of the content of organic matter and productivity of the soils. Conservation practices include maintaining vegetative cover to prevent erosion and manage areas for wildlife and migratory waterfowl habitat.

State and transition model



Code	Practice
1.1A	Secondary succession of species as site becomes more stable and vegetatively colonized.
1.2A	Site returns to primary succession via long inundation or other natural disturbance.
T1A	Site is prepared and planted to grass or crops.
R2A	Tree planting and return to natural flooding intervals.

Figure 5. STM

State 1
Forest

The Sandy Floodplain is a rapidly-changing state due to its proximity to rivers and streams. Sands and silts are dumped each time the area floods, as evidenced in the soil's weakly formed horizons. The Forest State has two communities, the 1.1 Willow/Cottonwood Forest Community and the 1.2 Hardwood Forest Community.

Dominant plant species

- black willow (*Salix nigra*), tree
- eastern cottonwood (*Populus deltoides*), tree
- lizard's tail (*Saururus cernuus*), grass

Community 1.1
Willow/Cottonwood Forest

The Willow/Cottonwood Forest Community represents primary succession and the earliest vegetative colonization of newly-formed point bars and splays. Black willow (*Salix nigra*) is the immediate colonizer, while cottonwood (*Populus deltoides*) is a secondary associate. The willows will eventually give way as cottonwoods age and secondary colonizers arrive.

Community 1.2
Hardwood Forest

After the initial colonization by willows and cottonwood, many other hardwoods take root. Cottonwood will remain the primary associate, but consociates include: riverbirch (*Betula nigra*), green ash, American sycamore (*Platanus occidentalis*), pecan, hackberry (*Celtis laevigata*), red maple, swamp privet (Forestiera acuminate), water elm (Planera aquatic), and American elm (Ulmus Americana). The successional sequence largely relies on river and stream meandering. As soils are deposited and removed, the community moves back and forth between 1.1 and 1.2.

Pathway 1.1A
Community 1.1 to 1.2

Secondary succession occurs as willow and cottonwood are replaced by hardwoods. The 1.1 vegetative community stabilizes the site and provides good growing conditions for the community 1.2 plants.

Pathway 1.2A
Community 1.2 to 1.1

Rivers and streams can shift or meander and remove or dump new sediments. These sandy sites have loose horizons and large floods can remove all vegetation. Site returns to community 1.1 by long inundation by flooding or other natural disturbance.

State 2
Pasture and Cropland

The Pasture and Cropland State is a result of conversion activities. The landowner has maximized agriculture production by planting a monoculture of introduced grass species or

agricultural row crops.

Dominant plant species

- Bermudagrass (*Cynodon*), grass
- bahiagrass (*Paspalum notatum*), grass

Community 2.1
Planted Pasture and Row Crop

Typical perennial warm-season grasses include Bermudagrass, bahiagrass, dallisgrass, and Johnsongrass. Spring and fall forages may include legumes such as clover. The grasses are grown for livestock production through direct grazing or baling hay for later use. Agricultural row crops are grown for food and fiber production. Typical crops include cotton, soybeans, milo, corn, rice, and sugarcane. Many farmers use herbicides to reduce unwanted plant competition which yields a plant community unrepresentative of State 1 or subsequent vegetative states.

Transition T1A
State 1 to 2

The transition is due to the land manager maximizing agricultural production. If present, merchantable timber is harvested by clearcut, then the site is prepared and planted to either a tame grass or row crop.

Restoration pathway R2A
State 2 to 1

This restoration path can be accomplished by planting a mix of native species to their natural frequencies. Management will be required to control unwanted species by burning, mowing, and/or herbicides. Controlling introduced pasture grasses is difficult, with complete control likely not attainable. The herbaceous understory will take time to develop, but this process can be expedited if adapted plant material seed is available.

Additional community tables

Inventory data references

These site descriptions were developed as part of the provisional ecological site initiative using historic soil survey manuscripts and low intensity field sampling.

Other references

Allen, J. A., B. D. Keeland, J. A. Stanturf, and A. F. Kennedy Jr. 2001. A guide to bottomland hardwood restoration. Technical report, USGS/BRD/ITR-2000-0011.

Louisiana Natural Heritage Program. 2009. The Natural Communities of Louisiana. Baton Rouge, LA, U.S.A. Data current as of August 2009.

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Randall, J. M., and J. Marinelli. 1996. Invasive plants: weeds of the global garden. Volume 149. Brooklyn Botanic Garden, Brooklyn, NY.

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Stanturf, J. A., S. H. Schoenholtz, C. J. Schweitzer, and J. P. Shepard. 2001. Achieving restoration success: Myths in bottomland hardwood forests. Restoration Ecology, 9:189-200.

Stringham, T. K., W. C. Krueger, and P. L. Shaver. 2003. State and transition modeling: An ecological process approach. Journal of Range Management 56:106-113.

U.S. Army Corps of Engineers. 2010. Regional supplement to the Corps of Engineers Wetland Delineation Manual: Atlantic and Gulf Coastal Plain Region (Version 2.0). U.S. Army Corps of Engineers, Engineer Research and Development Center, Environmental Laboratory ERDC/EL TR-10-20.

USDA-NRCS Ag Handbook 296 (2006).

Contributors

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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	03/19/2021

Approved by	Bryan Christensen
Approval date	
Composition (Indicators 10 and 12) based on	Annual Production

Indicators

1. **Number and extent of rills:**

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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:**

17. **Perennial plant reproductive capability:**