Ecological site R080AY050OK
Loamy Bottomland

Last updated: 9/19/2023
Accessed: 04/27/2024

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.

Figure 1. Mapped extent

Areas shown in blue indicate the maximum mapped extent of this ecological site. Other ecological sites likely occur within the highlighted areas. It is also possible for this ecological site to occur outside of highlighted areas if detailed soil survey has not been completed or recently updated.

MLRA notes

Major Land Resource Area (MLRA): 080A–Central Rolling Red Prairies

MLRA 80A is characterized by dark red Permian rocks that are exposed on gently sloping plains. These plains are dissected by rivers that flow from northwest to southeast. Major rivers of this MLRA include the Chickaskia and Bluff rivers in KS, the Salt Fork, Cimarron,North and South Canadian,Washita, Cache, Red River in OK, and branches of the Wichita River in TX. Soils are generally well drained, loamy or clayey deposits overlying Permian sandstones or shales.

Classification relationships

This ecological site is correlated to soil components at the Major Land Resource Area (MLRA) level which is further described in USDA Ag Handbook 296.

Ecological site concept

This site occurs on deep, loamy soils on floodplains. The sites are periodically flooded and also receive run-on water from adjacent uplands. The reference plant community is dominated by tallgrasses mixed with midgrasses and forbs. Shrubs may be present and small amounts and there may be a mixture of bottomland hardwood trees scattered across the landscape. In the absence of fire, various woody species including elm, hackberry, and eastern

redcedar may dominate the landscape.

Associated sites

R080AY056OK	**Loamy Upland** Loamy soils on uplands.
R080AY001OK	**Alkali Bottomland** Localized sodic areas on floodplains
R080AY045OK	**Clay Bottomland** Clay soils. Similar landscape positions.

Similar sites

R080AY045OK	**Clay Bottomland** Clay soils. Similar landscape positions.
R080AY068OK	**Sandy Bottomland** Sandy soils. Similar landscape positions.

Table 1. Dominant plant species

Tree	(1) *Carya illinoinensis*
Shrub	Not specified
Herbaceous	(1) *Tripsacum dactyloides*

Physiographic features

These sites are deep, productive, alluvial, loamy bottomlands subject to frequent or occasional overflow from streams and runoff from hillsides. This site ranges from gently sloping and level bottomlands with slopes from 0% to 2%.

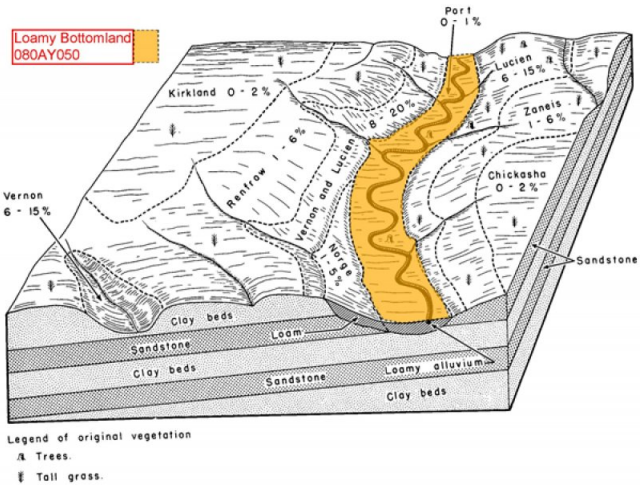

Figure 2. R080AY050OK

Table 2. Representative physiographic features

Landforms	(1) Alluvial plain > Flood plain
Runoff class	Negligible to medium
Flooding duration	Very brief (4 to 48 hours) to brief (2 to 7 days)
Flooding frequency	Rare to frequent
Elevation	500–1,500 ft
Slope	0–2%

Water table depth	60 in
Aspect	Aspect is not a significant factor

Climatic features

The climate is characterized by moist, cool, springs; hot, often dry summers; mild autumns; and mild to cold winters. Variation in timing and amounts of precipition from year to year is quite common. Drought cycles range from three to five years duration with occasionally longer periods occurring at unpredictable intervals. Above normal rainfall cycles are usually just as random, but shorter in duration.

Table 3. Representative climatic features

Frost-free period (characteristic range)	174-188 days
Freeze-free period (characteristic range)	194-212 days
Precipitation total (characteristic range)	33-39 in
Frost-free period (actual range)	161-191 days
Freeze-free period (actual range)	190-223 days
Precipitation total (actual range)	31-43 in
Frost-free period (average)	180 days
Freeze-free period (average)	205 days
Precipitation total (average)	37 in

Climate stations used

- (1) PAWHUSKA [USC00346935], Pawhuska, OK
- (2) PERRY [USC00347012], Perry, OK
- (3) PONCA CITY MUNI AP [USW00013969], Ponca City, OK
- (4) OKEENE [USC00346629], Okeene, OK
- (5) GEARY [USC00343497], Calumet, OK
- (6) CARNEGIE 5 NE [USC00341504], Carnegie, OK
- (7) CHICKASHA EXP STATION [USC00341750], Chickasha, OK
- (8) NORMAN 3SSE [USC00346386], Norman, OK
- (9) PAULS VALLEY 4 WSW [USC00346926], Pauls Valley, OK
- (10) CUSHING [USC00342318], Cushing, OK
- (11) MEEKER 5 W [USC00345779], Meeker, OK
- (12) RALSTON [USC00347390], Ralston, OK
- (13) JEFFERSON [USC00344573], Medford, OK
- (14) ANTHONY [USW00013980], Anthony, KS

Influencing water features

These sites occur on floodplains and drainageways on deep, alluvial soils. These areas receive run-on water from adjacent upland sites. Run off is usually slow due to the low slopes of the floodplain. The presence of deep rooted tallgrasses can help facilitate percolation of water into the soil profile.

Wetland description

NA

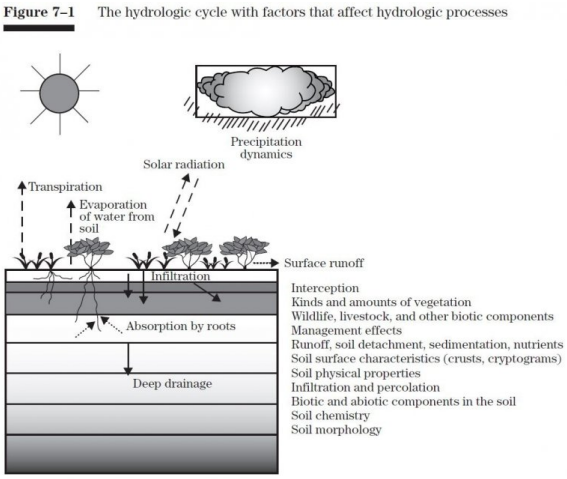

Figure 9.

Soil features

Soils are mapped for each county within the MLRA. Mapunits are representations of the major soil series component(s) and named accordingly. Each Mapunit is spatially represented on a digital soils map as polygons of different shapes and sizes. Within these Mapunits, there are often minor soil series components included. These minor components are soils that occur within a Mapunit polygon but are of small extent (15% or less of the Mapunit area). However, it is difficult to separate these minor soils spatially due to the scale of soil mapping.

Ecological sites are correlated at the component level of the soil survey. Therefore, a single Mapunit may contain multiple Ecological Sites just as it may contain multiple soil components. This is important to understand when investigating soils and Ecological Sites. A soil survey Mapunit may be correlated to a single Ecological Site based on the major component; however, there may be inclusional areas of additional Ecological Sites which are correlated to the minor components of that particular soil Mapunit.

Representative soil components for this site include:
Port, Dale, and Yahola

These are deep, dark, loamy alluvial soils on the level floodplains of larger streams. Surface soils are loams and silt over deep, sometimes stratified alluvial deposits of loams, sandy loams, or clay loams. The soils are neutral to calcareous and are both friable and permeable. They are fertile and have a good infiltration rate as well as a high moisture storage capacity. They are occasionally overflowed and sometimes receive excess water from adjacent slopes. Soils in this site are very productive.

Table 4. Representative soil features

Parent material	(1) Alluvium–sandstone and shale
Surface texture	(1) Loam (2) Sandy loam (3) Silt loam
Drainage class	Moderately well drained to well drained
Permeability class	Moderate to moderately rapid
Soil depth	60 in
Surface fragment cover <=3"	0–1%
Surface fragment cover >3"	0–1%
Available water capacity (0-40in)	9–12 in
Calcium carbonate equivalent (0-40in)	0–1%

Electrical conductivity (0-40in)	0–1 mmhos/cm
Sodium adsorption ratio (0-40in)	0–1
Soil reaction (1:1 water) (0-40in)	6.5–7.5
Subsurface fragment volume <=3" (Depth not specified)	0–4%

Ecological dynamics

The information contained in the State and Transition Diagram (STD) and the Ecological Site Description was developed using archaeological and historical data, professional experience, and scientific studies. The information presented is representative of a very 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.

The reference plant community is tallgrass dominated with midgrasses and forbs. This site occurs on broad bottoms adjacent to streams and rivers and along narrower upland drainageways. Loamy Bottomland soils have deep, fertile, loamy surfaces that often receive extra moisture from overflow or run-in from adjacent slopes. Plant community dominance in the plains usually oft-times depends on fire and grazing histories of the site. Historically, a major portion of this site was subjected to occasional fire and large animal herbivory (i.e. bison, elk, deer). The resultant plant community was usually dominated by deep rooted, warm season, perennial, tallgrasses. All the major grasses, and most of the dominant forbs, are rhizomatous. The rhizomes of grasses saturate the upper four to five inches of soil and are usually tightly intertwined and intermixed with numerous deep rooted perennial warm season forbs. Because of this site's deep soils and high rainfall averages, the plant community is very productive. For centuries, the reference plants of this community have withstood sporadic rainfall; flooding and sedimentation; long rainy periods and extended drouths. Some narrow areas, located adjacent to streams and rivers, along with a few larger areas such as oxbows, were historically protected from fire. These protected areas developed savannah or woodland type plant communities dominated by an overstory of large hardwood trees and a understory of predominately cool season grasses and other shade tolerant plants.

In addition to the reference state, several other plant communities can exist on Loamy Bottomland sites. These communities usually reflect historical management practices. There are various recognizable stages of degradation on this site. Each stage may result in a plant community that may, or may not, remain stable for many years. Loamy Bottomland is a favored grazing area by most large herbivores, so long term overgrazing is common unless prescribed grazing regimes are implemented. Long term overgrazing by cattle results in a gradual decrease of the tallgrasses and preferred forbs. As these preferred species decline, they are replaced by midgrasses and less palatable forbs. For various reasons, as degradation continues on the site, woody species such as eastern redcedar begin to invade the plant community.

Fire was a major influence in the development of this site. With the suppression of fire, over time, shrubs and trees usually invade the grassland portions of Loamy Bottomlands and may eventually become the dominant species on site. Shrub invasion can occur, regardless of the grazing regime, in the absence of fire.

State and Transition Diagram:
A State and Transition Diagram for the Loamy Bottomland (R080AY050OK) site is depicted below. Thorough descriptions of each state, transition, and pathway follow the model. Experts base this model on available experimental research, field observations, professional consensus, and interpretations. It is likely to change as knowledge increases.
Plant communities will differ across the MLRA because of the natural variability in weather, soils, and aspect. The Reference Plant Community is not necessarily the management goal; other vegetative states may be desired plant communities as long as the Range Health assessments are in the moderate and above category.

The biological processes on this site are complex. Therefore, representative values are presented in a land management context. The species lists are representative and are not botanical descriptions of all species occurring, or potentially occurring, on this site. They are not intended to cover every situation or the full range of

conditions, species, and responses for the site.

Composition by dry weight and percent canopy cover are provided to describing the functional groups. Most observers find it easier to visualize or estimate percent canopy for woody species (trees and shrubs).

The following diagram suggests some pathways that the vegetation on this site might take. There may be other states not shown on the diagram. This information is intended to show what might happen in a given set of circumstances. It does not mean that this would happen the same way in every instance. Local professional guidance should always be sought before pursuing a treatment scenario.

State and transition model

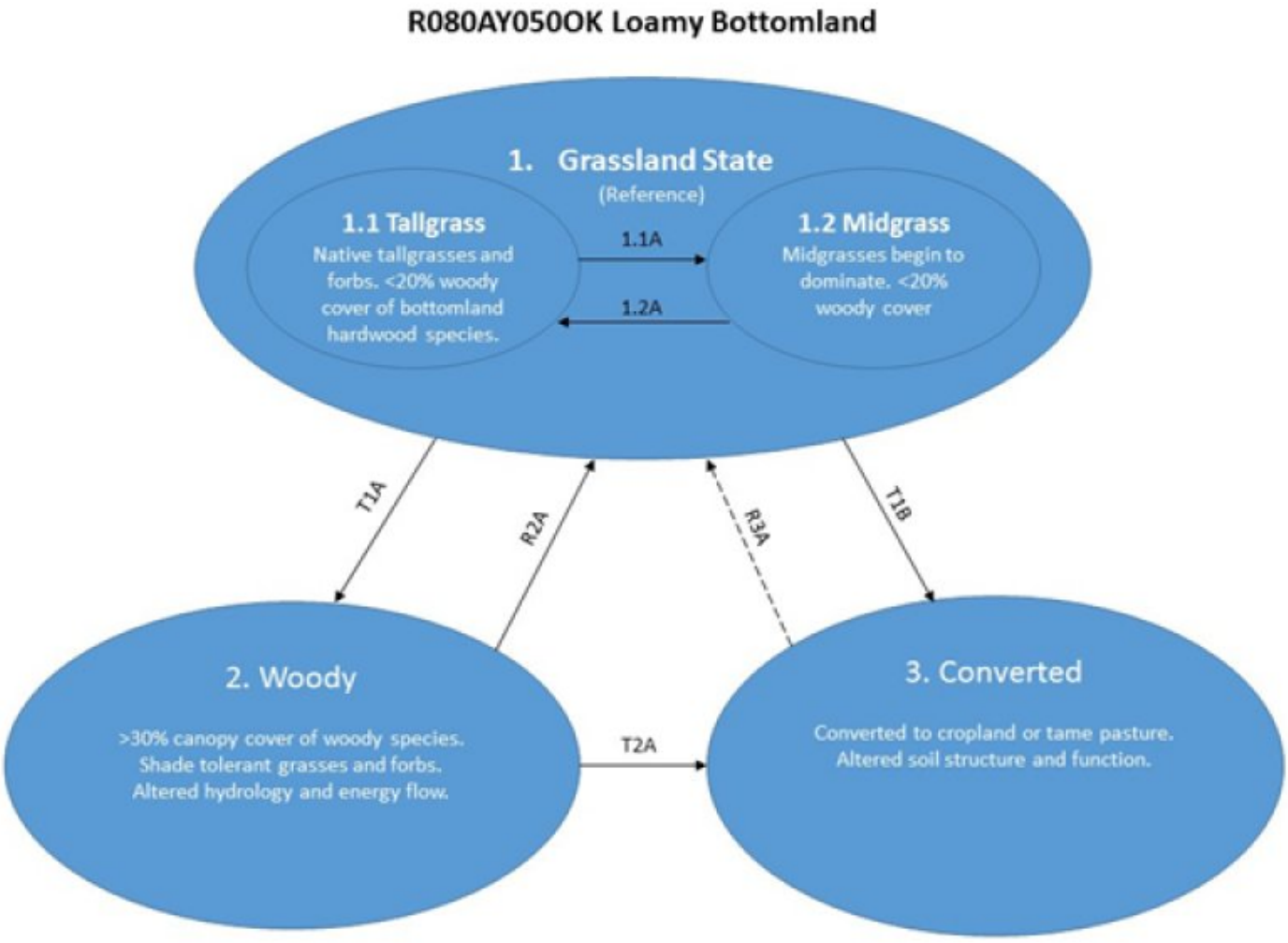

Figure 10. R080AY050OK

Legend

1.1A: Abusive grazing over multiple growing seasons.
1.2A: Prescribed grazing including growing season deferment.
T1A: No Fire; No Brush Management.
T1B,T2A: Cultivation; Land Use Change
R2A: Prescribed Fire; Brush Management.
R3A: Range Planting; Prescribed Grazing; Time.

Figure 11. R080AY050OK

State 1
Grassland

This is the reference or diagnostic community for the site. The description is based on early range site descriptions, clipping data, professional consensus of experienced range specialists, and analysis of field work

Dominant plant species

- pecan (*Carya illinoinensis*), tree
- eastern gamagrass (*Tripsacum dactyloides*), grass

Community 1.1
Tallgrass

Figure 12. Loamy Bottomland #1, HPC

Figure 13. Loamy Bottomland, Talgrass Dominant

The reference community is dominated by a composite of tall, warm season grasses. Big bluestem, eastern gamagrass, Indiangrass, prairie cordgrass and switchgrass comprise approximately 80 percent of the vegetation. Secondary grasses occur in minor amounts. These secondary grasses include tall dropseed, Florida paspalum, beaked panicum, little bluestem and knotroot bristlegrass. Cool season grasses and grasslike plants such as Canada wildrye, Virginia wildrye and sedges may contribute up to five percent of the total vegetation on site. Most of the major grasses grow during the months April through June. In a typical year, approximately 75 to 80 percent of the annual herbage production is completed by the first of July. Both eastern gamagrass and prairie cordgrass have been observed emerging through several inches of sediment deposited on the site by flood waters. Numerous forbs prevail on this site. The more abundant forbs are wholeleaf rosinweed, Maximilian sunflower, sawtooth sunflower and Illinois bundleflower. Other common forbs are cupleaf rosinweed, stiffleaf sunflower, ashy sunflower, Canada goldenrod, heathaster, smooth oxeye, prairie acacia and roundhead lespedeza. Under moderate levels of grazing, the major HPC grasses on this site will remain very durable and plant composition proportions can be maintained almost indefinitely. Most of the palatable forbs will decrease with light to moderate continuous grazing, however, it is possible to maintain these palatable forbs under periodic deferment by using prescribed grazing. Overgrazing by livestock will eventually have major impacts on vegetation composition. A decrease in vigor of the more palatable grasses will encourage a gradual increase in secondary plants such as tall dropseed, purpletop, silver bluestem and sideoats grama. Many of the forbs are very palatable and readily selected by livestock. Forbs that increase with overgrazing include heathaster, tall goldenrod, Missouri goldenrod, western ragweed and Louisiana sagewort. Woody plants such as buckbrush, blackberry, roughleaf dogwood, smooth sumac, persimmon, hawthorn, elm, oak and ash also increase under Long term overgrazing, especially if there is also absence of fire. Often, the total elimination of fire on this site, regardless of grazing intensity implemented, can result in the transformation of a herbaceous dominated plant community to a community almost closed by tree canopy. Major tree species that encroach on the site are oak, ash, elm, hackberry, pecan, sycamore and cottonwood.

Table 5. Annual production by plant type

Plant Type	Low (Lb/Acre)	Representative Value (Lb/Acre)	High (Lb/Acre)
Grass/Grasslike	7300	9000	12400
Forb	500	800	1400
Shrub/Vine	100	100	100
Tree	100	100	100
Total	**8000**	**10000**	**14000**

Figure 15. Plant community growth curve (percent production by month). OK0001, Native, Warm Season Grasses. Typically, the summer growing season for warm season grasses begins April 5 to 15 and ends October 15 to 25. Nearly three-fourths of the season production will occur before the first of July. This varies from year to year depending upon temperatures and precipitation..

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0	1	5	10	20	30	10	5	10	6	2	1

Community 1.2
Midgrass/Tallgrass

This plant community is dominated by a mixture of midgrasses and tallgrasses with the midgrasses more prevelant than the tallgrasses. There has been a decrease in the more palatable grasses such as eastern gamagrass, big bluestem and Indiangrass. These grasses have been replaced by an increase in secondary grasses including purpletop, knotroot bristlegrass, and tall dropseed. Western wheatgrass is more abundant in northern counties. Shortgrasses such as buffalograss and fall witchgrass are found in some areas. These changes have resulted in a reduction in herbage production on the site. The dominant perennial forbs are heathaster, Canada goldenrod, Baldwin ironweed and tall eupatorium. Heavy stands of annuals often occur after periods of close grazing. These annuals include seacoast sumpweed, common sunflower, giant ragweed, annual ragweed and marestail. Continuous overgrazing has reduced the fuel load and lessened the occurrence and subsequent benefits of prescribed burning. Shrubs, including buckbrush, blackberry, sumac and roughleaf dogwood are common. Tree species such as elm, hackberry, Osage orange and eastern redcedar are often scattered across the site. Prescribed burning coupled with prescribed grazing, involving deferment during all or a part of the growing season, will increase the desirable grasses. This site can be restored to near reference conditions in eight to twelve years.

Table 6. Annual production by plant type

Plant Type	Low (Lb/Acre)	Representative Value (Lb/Acre)	High (Lb/Acre)
Grass/Grasslike	4000	5500	6800
Forb	300	500	800
Shrub/Vine	450	600	600
Tree	250	300	300
Total	**5000**	**6900**	**8500**

Figure 17. Plant community growth curve (percent production by month). OK0001, Native, Warm Season Grasses. Typically, the summer growing season for warm season grasses begins April 5 to 15 and ends October 15 to 25. Nearly three-fourths of the season production will occur before the first of July. This varies from year to year depending upon temperatures and precipitation..

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0	1	5	10	20	30	10	5	10	6	2	1

Pathway 1.1A

Community 1.1 to 1.2

If the site is subjected to abusive grazing for multiple growing seasons and the more palatable tallgrass species are not allowed adequate recovery, the plant community will begin to transition to a Midgrass dominated plant community(1.2). This community shift may also occur as a result of long term drought as the Midgrass and Shortgrass species are better adapted to dry climates. This pathway is not a one-way street and it is important to remember that this community shift occurred often, historically, and represents the variability within this Reference Sate.

Pathway 1.2A
Community 1.2 to 1.1

With adequate rest from grazing pressure and favorable growing conditions, this plant community may be able to return to the reference plant community (1.1).

State 2
Woody

The description for this plant community is derived from analysis of limited field data and professional consensus of range trained individuals. This plant community is a result of the absence of fire. Fire was an important element in suppressing woody plants during the ecological evolution of this site. So, when fire was suppressed for many years, the vegetative composition naturally and gradually shifted towards woody plant dominance. Areas protected from both fire and grazing for 20 to 30 years, or longer, have transitioned from open grassland to closed canopy woodland. Some areas, due to their juxtaposition to streams, were historically protected from reoccurring fires. Species composition of woody plants will vary from area to area. But generally, tree species will be bur oak, hackberry, elm, ash, sycamore or pecan. Eastern redcedar is becoming more prominent in this plant community. Shrubs and vines common to the site are buckbrush, sumac, blackberry, poison ivy, grape and greenbrier. Combined trees and shrubs may form an overstory canopy of 70 to 80 percent. The understory is dominated by shade tolerant plants such as Virginia wildrye, Canada wildrye, sedges, Scribner's panicum, Indian woodoats, sweet woodreed and various muhlys. Herbage production suitable for livestock use is limited. The site provides shelter for both livestock, deer and numerous small mammals. Many species of birds frequent this site.

Dominant plant species

- pecan (*Carya illinoinensis*), tree
- elm (*Ulmus*), tree
- hackberry (*Celtis*), tree
- eastern redcedar (*Juniperus virginiana*), tree
- coralberry (*Symphoricarpos orbiculatus*), shrub
- wildrye (*Elymus*), grass

State 3
Converted

Many loamy bottomland sites have been cultivated over the past century in order to produce crops. Due to the level, deep loam soils, these sites are well suited for Ag production. Within this state, most woody species have been cleared in order to facilitate the access of farm machinery.

Dominant plant species

- wheat (*Triticum*), grass
- soybean (*Glycine max*), other herbaceous

Transition T1A
State 1 to 2

Without fire in the ecosystem, woody species may grow and reproduce unchecked. These species may be endemic (pecan, hackberry, etc.) or species introduced to the site by animals (eastern redcedar) or plantings (black locust/honey locust). These woody species have the ability to grow deep roots and locate resources within the soil

that herbaceous species may not have access to. This gives them a competitive edge for resources and allows them to expand across the landscape. As this woody encroachment occurs, the site may transition to state 2 where the woody species begin to dominate the ecological functions of the plant community.

Transition T1B
State 1 to 3

Many of these sites have been plowed for farming purposes over the last century. Once the site is cultivated, it transitions to an alternative state (3). The soils structure, organic matter, and biota have been altered and will no longer function the same as the soils in the reference state.

Restoration pathway R2A
State 2 to 1

A carefully planned program will restore the Woody state to a close resemblance to a grassland state. Because the woody community may be difficult to burn (but susceptible to wildfires), some brush management intervention will be needed. Brush management either mechanical, chemical or an integration of both, will allow sunlight energy and soil moisture to be used by tall grasses rather than invasive brush. Careful grazing management will be required for this plant community to be restored to the grassland state (1).

Transition T2A
State 2 to 3

Many of these sites have been plowed for farming purposes over the last century. Once the site is cultivated, it transitions to an alternative state (3). The soils structure, organic matter, and biota have been altered and will no longer function the same as the soils in the reference or woody state.

Restoration pathway R3A
State 3 to 1

Through carefully planned implementation of range seeding, prescribed grazing and rest, the cultivated state can be returned to a plant community similar to those in the reference state.

Context dependence. As a result of cultivation and soil erosion, soil properties are altered and ecological processes are changed. While permanent native vegetation can be re-established to a species mix similar to the reference state, often the site may never be restored ecologically to reference condition. This is especially true of sites that have experience a significant loss of the soil surface horizon. However, many sites have been restored to something very close the reference state and this should always be the target if full ecological restoration is the goal.

Additional community tables

Table 7. Community 1.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production (Lb/Acre)	Foliar Cover (%)
Grass/Grasslike					
1				6480–11200	
	big bluestem	ANGE	*Andropogon gerardii*	2000–3500	–
	Indiangrass	SORGH	*Sorghastrum*	1000–2000	–
	eastern gamagrass	TRDA3	*Tripsacum dactyloides*	1000–1500	–
	prairie cordgrass	SPPE	*Spartina pectinata*	500–1000	–
	switchgrass	PAVI2	*Panicum virgatum*	500–1000	–
2				324–560	
	Florida paspalum	PAFL4	*Paspalum floridanum*	50–100	–
	little bluestem	SCSC	*Schizachyrium scoparium*	50–100	–

	little bluestem	SCSC	*Schizachyrium scoparium*	50–100	–
	marsh bristlegrass	SEPA10	*Setaria parviflora*	50–100	–
3				324–560	
	Indian woodoats	CHLA5	*Chasmanthium latifolium*	10–50	–
	Mexican muhly	MUME2	*Muhlenbergia mexicana*	10–50	–
	vine mesquite	PAOB	*Panicum obtusum*	10–50	–
	thin paspalum	PASE5	*Paspalum setaceum*	10–40	–
	rice cutgrass	LEOR	*Leersia oryzoides*	0–30	–
	whitegrass	LEVI2	*Leersia virginica*	10–20	–
	longleaf woodoats	CHSE2	*Chasmanthium sessiliflorum*	0–20	–
	sweet woodreed	CIAR2	*Cinna arundinacea*	0–20	–
4				81–140	
	composite dropseed	SPCO16	*Sporobolus compositus*	10–70	–
	purpletop tridens	TRFL2	*Tridens flavus*	10–50	–
	fall witchgrass	DICO6	*Digitaria cognata*	10–50	–
	purple lovegrass	ERSP	*Eragrostis spectabilis*	10–50	–
	bushy bluestem	ANGL2	*Andropogon glomeratus*	10–20	–
	broomsedge bluestem	ANVI2	*Andropogon virginicus*	10–20	–
	silver bluestem	BOSA	*Bothriochloa saccharoides*	10–20	–
5				405–700	
	Canada wildrye	ELCA4	*Elymus canadensis*	100–250	–
	Virginia wildrye	ELVI3	*Elymus virginicus*	100–200	–
	western wheatgrass	PASM	*Pascopyrum smithii*	50–100	–
	Texas bluegrass	POAR	*Poa arachnifera*	50–100	–
	sedge	CAREX	*Carex*	50–100	–
	common spikerush	ELPA3	*Eleocharis palustris*	20–60	–
	Kentucky bluegrass	POPR	*Poa pratensis*	20–60	–
	Scribner's rosette grass	DIOLS	*Dichanthelium oligosanthes var. scribnerianum*	20–60	–
	porcupinegrass	HESP11	*Hesperostipa spartea*	20–50	–
	Texas wintergrass	NALE3	*Nassella leucotricha*	20–50	–
	deertongue	DICL	*Dichanthelium clandestinum*	20–40	–
	winter bentgrass	AGHY	*Agrostis hyemalis*	20–40	–
Forb					
6				441–1260	
	wholeleaf rosinweed	SIIN2	*Silphium integrifolium*	200–300	–
	sawtooth sunflower	HEGR4	*Helianthus grosseserratus*	100–300	–
	Maximilian sunflower	HEMA2	*Helianthus maximiliani*	100–300	–
	compassplant	SILA3	*Silphium laciniatum*	100–200	–
	cup plant	SIPE2	*Silphium perfoliatum*	50–150	–
	ashy sunflower	HEMO2	*Helianthus mollis*	20–50	–
	stiff sunflower	HEPA19	*Helianthus pauciflorus*	20–50	–
	Jerusalem artichoke	HETU	*Helianthus tuberosus*	20–50	–
	whitest evening primrose	OEAL	*Oenothera albicaulis*	10–50	–

	cobaea beardtongue	PECO4	*Penstemon cobaea*	10–50	–
	azure blue sage	SAAZ	*Salvia azurea*	10–50	–
	fringeleaf wild petunia	RUHU	*Ruellia humilis*	10–30	–
	prairie blazing star	LIPY	*Liatris pycnostachya*	10–30	–
	devil's bite	LISC2	*Liatris scariosa*	10–30	–
	prairie spiderwort	TROC	*Tradescantia occidentalis*	10–30	–
	Culver's root	VEVI4	*Veronicastrum virginicum*	10–30	–
7				441–1260	
	Canada goldenrod	SOCA6	*Solidago canadensis*	10–60	–
	white heath aster	SYER	*Symphyotrichum ericoides*	10–60	–
	Missouri goldenrod	SOMI2	*Solidago missouriensis*	10–50	–
	tall thoroughwort	EUAL3	*Eupatorium altissimum*	10–50	–
	Appalachian mountainmint	PYFL	*Pycnanthemum flexuosum*	10–50	–
	white crownbeard	VEVI3	*Verbesina virginica*	10–50	–
	wingstem	VEAL	*Verbesina alternifolia*	10–50	–
	groovestem Indian plantain	ARPL4	*Arnoglossum plantagineum*	10–50	–
	false boneset	BREU	*Brickellia eupatorioides*	10–50	–
	Philadelphia fleabane	ERPH	*Erigeron philadelphicus*	10–50	–
	largeflower tickseed	COGR5	*Coreopsis grandiflora*	10–30	–
	Indian paintbrush	CASTI2	*Castilleja*	10–30	–
	tall thistle	CIAL2	*Cirsium altissimum*	10–30	–
	swamp milkweed	ASIN	*Asclepias incarnata*	10–30	–
	prairie milkweed	ASSU3	*Asclepias sullivantii*	10–30	–
	common milkweed	ASSY	*Asclepias syriaca*	10–30	–
	butterfly milkweed	ASTU	*Asclepias tuberosa*	10–30	–
	whorled milkweed	ASVE	*Asclepias verticillata*	10–30	–
	green antelopehorn	ASVI2	*Asclepias viridis*	10–30	–
	Virginia threeseed mercury	ACVI	*Acalypha virginica*	10–30	–
	Cuman ragweed	AMPS	*Ambrosia psilostachya*	10–30	–
	Arkansas ironweed	VEAR3	*Vernonia arkansana*	10–30	–
	Baldwin's ironweed	VEBA	*Vernonia baldwinii*	10–30	–
	golden zizia	ZIAU	*Zizia aurea*	10–30	–
	pinnate prairie coneflower	RAPI	*Ratibida pinnata*	10–30	–
	rough coneflower	RUGR	*Rudbeckia grandiflora*	10–30	–
	browneyed Susan	RUTR2	*Rudbeckia triloba*	10–30	–
	stiff goldenrod	OLRI	*Oligoneuron rigidum*	10–30	–
	downy phlox	PHPI	*Phlox pilosa*	10–30	–
	shorthair goldenrod	SOCAG	*Solidago canadensis var. gilvocanescens*	10–30	–
	skyblue aster	SYOO	*Symphyotrichum oolentangiense*	10–30	–
	white arrowleaf aster	SYUR	*Symphyotrichum urophyllum*	10–30	–
	Canada germander	TECA3	*Teucrium canadense*	10–30	–

	Nuttall's prairie parsley	PONU4	*Polytaenia nuttallii*	10–20	–
	stiff marsh bedstraw	GATI	*Galium tinctorium*	10–20	–
	cardinalflower	LOCA2	*Lobelia cardinalis*	10–20	–
	great ragweed	AMTR	*Ambrosia trifida*	10–20	–
	white doll's daisy	BOAS	*Boltonia asteroides*	10–20	–
	spotted water hemlock	CIMA2	*Cicuta maculata*	10–20	–
	wavyleaf thistle	CIUN	*Cirsium undulatum*	10–20	–
	poison hemlock	COMA2	*Conium maculatum*	10–20	–
	Queen Anne's lace	DACA6	*Daucus carota*	10–20	–
	field horsetail	EQAR	*Equisetum arvense*	10–20	–
	prairie fleabane	ERST3	*Erigeron strigosus*	10–20	–
8				126–360	
	Illinois bundleflower	DEIL	*Desmanthus illinoensis*	20–150	–
	American licorice	GLLE3	*Glycyrrhiza lepidota*	20–100	–
	littleleaf sensitive-briar	MIMI22	*Mimosa microphylla*	20–100	–
	prairie acacia	ACAN	*Acacia angustissima*	20–100	–
	Canadian milkvetch	ASCA11	*Astragalus canadensis*	20–50	–
	white wild indigo	BAAL	*Baptisia alba*	20–50	–
	longbract wild indigo	BABR2	*Baptisia bracteata*	20–50	–
	white prairie clover	DACA7	*Dalea candida*	20–50	–
	purple dalea	DALA4	*Dalea lasiathera*	20–50	–
	slimflower scurfpea	PSTE5	*Psoralidium tenuiflorum*	20–50	–
	roundhead lespedeza	LECA8	*Lespedeza capitata*	20–50	–
	sessileleaf ticktrefoil	DESE	*Desmodium sessilifolium*	20–50	–
Shrub/Vine					
9				0–100	
	leadplant	AMCA6	*Amorpha canescens*	20–100	–
	winged sumac	RHCO	*Rhus copallinum*	20–100	–
	smooth sumac	RHGL	*Rhus glabra*	20–100	–
	climbing rose	ROSE2	*Rosa setigera*	20–100	–
	western poison ivy	TORY	*Toxicodendron rydbergii*	20–100	–
	rusty blackhaw	VIRU	*Viburnum rufidulum*	20–50	–
	grape	VITIS	*Vitis*	20–50	–
	blackberry	RUBUS	*Rubus*	20–50	–
	elderberry	SAMBU	*Sambucus*	20–50	–
	saw greenbrier	SMBO2	*Smilax bona-nox*	20–50	–
	Ohio buckeye	AEGL	*Aesculus glabra*	20–50	–
	false indigo	AMORP	*Amorpha*	20–50	–
	pawpaw	ASTR	*Asimina triloba*	20–50	–
	buckbrush	CECU	*Ceanothus cuneatus*	20–50	–
	common buttonbush	CEOC2	*Cephalanthus occidentalis*	20–50	–
	Carolina coralbead	COCA	*Cocculus carolinus*	20–50	–
	limber honeysuckle	LODI2	*Lonicera dioica*	20–50	–
	yellow honeysuckle	LOFL	*Lonicera flava*	20–50	–

	Virginia creeper	PAQU2	*Parthenocissus quinquefolia*	20–50	–
	American plum	PRAM	*Prunus americana*	20–50	–
Tree					
10				0–100	
	river birch	BENI	*Betula nigra*	50–100	–
	pecan	CAIL2	*Carya illinoinensis*	50–100	–
	hybrid hickory	CARYA	*Carya*	50–100	–
	common hackberry	CEOC	*Celtis occidentalis*	50–100	–
	hawthorn	CRATA	*Crataegus*	50–100	–
	white ash	FRAM2	*Fraxinus americana*	50–100	–
	black walnut	JUNI	*Juglans nigra*	50–100	–
	Osage-orange	MAPO	*Maclura pomifera*	50–100	–
	American sycamore	PLOC	*Platanus occidentalis*	50–100	–
	eastern cottonwood	PODE3	*Populus deltoides*	50–100	–
	bur oak	QUMA2	*Quercus macrocarpa*	50–100	–
	post oak	QUST	*Quercus stellata*	50–100	–
	black oak	QUVE	*Quercus velutina*	50–100	–
	black willow	SANI	*Salix nigra*	50–100	–
	gum bully	SILAL3	*Sideroxylon lanuginosum ssp. lanuginosum*	50–100	–
	American elm	ULAM	*Ulmus americana*	50–100	–
	cedar elm	ULCR	*Ulmus crassifolia*	50–100	–
	slippery elm	ULRU	*Ulmus rubra*	50–100	–

Table 8. Community 1.2 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production (Lb/Acre)	Foliar Cover (%)
Grass/Grasslike					
1				1606–2640	
	big bluestem	ANGE	*Andropogon gerardii*	600–1200	–
	switchgrass	PAVI2	*Panicum virgatum*	200–500	–
	Indiangrass	SORGH	*Sorghastrum*	200–500	–
	prairie cordgrass	SPPE	*Spartina pectinata*	50–100	–
	eastern gamagrass	TRDA3	*Tripsacum dactyloides*	20–50	–
2				1640–2400	
	composite dropseed	SPCO16	*Sporobolus compositus*	300–900	–
	purpletop tridens	TRFL2	*Tridens flavus*	200–500	–
	blue panicum	PAAN4	*Panicum antidotale*	200–500	–
	little bluestem	SCSC	*Schizachyrium scoparium*	200–400	–
	marsh bristlegrass	SEPA10	*Setaria parviflora*	100–400	–
	Florida paspalum	PAFL4	*Paspalum floridanum*	100–300	–
	broomsedge bluestem	ANVI2	*Andropogon virginicus*	100–300	–
	silver bluestem	BOSA	*Bothriochloa saccharoides*	100–300	–
	purple lovegrass	ERSP	*Eragrostis spectabilis*	100–300	–

	vine mesquite	PAOB	*Panicum obtusum*	25–100	–
	longspike tridens	TRST2	*Tridens strictus*	25–100	–
3				219–360	
	windmill grass	CHLOR	*Chloris*	25–200	–
	fall witchgrass	DICO6	*Digitaria cognata*	25–200	–
4				511–840	
	western wheatgrass	PASM	*Pascopyrum smithii*	100–500	–
	Texas bluegrass	POAR	*Poa arachnifera*	50–200	–
	sedge	CAREX	*Carex*	100–200	–
	Canada wildrye	ELCA4	*Elymus canadensis*	100–200	–
	Virginia wildrye	ELVI3	*Elymus virginicus*	50–200	–
	Scribner's rosette grass	DIOLS	*Dichanthelium oligosanthes var. scribnerianum*	50–100	–
	winter bentgrass	AGHY	*Agrostis hyemalis*	50–100	–
5				146–240	
	cheatgrass	BRTE	*Bromus tectorum*	20–100	–
Forb					
6				365–600	
	tall thoroughwort	EUAL3	*Eupatorium altissimum*	25–100	–
	Canada goldenrod	SOCA6	*Solidago canadensis*	25–100	–
	Missouri goldenrod	SOMI2	*Solidago missouriensis*	25–100	–
	false gaura	STLI2	*Stenosiphon linifolius*	25–100	–
	white heath aster	SYER	*Symphyotrichum ericoides*	25–100	–
	wingstem	VEAL	*Verbesina alternifolia*	25–100	–
	Arkansas ironweed	VEAR3	*Vernonia arkansana*	25–100	–
	Baldwin's ironweed	VEBAB	*Vernonia baldwinii ssp. baldwinii*	25–100	–
	Cuman ragweed	AMPS	*Ambrosia psilostachya*	50–100	–
	white sagebrush	ARLU	*Artemisia ludoviciana*	50–100	–
	groovestem Indian plantain	ARPL4	*Arnoglossum plantagineum*	50–100	–
	green antelopehorn	ASVI2	*Asclepias viridis*	50–100	–
	white crownbeard	VEVI3	*Verbesina virginica*	25–100	–
	blue wild indigo	BAAU	*Baptisia australis*	20–50	–
	hoary verbena	VEST	*Verbena stricta*	25–50	–
7				73–120	
	annual ragweed	AMAR2	*Ambrosia artemisiifolia*	50–100	–
	great ragweed	AMTRT2	*Ambrosia trifida var. trifida*	50–100	–
	field horsetail	EQAR	*Equisetum arvense*	50–100	–
Shrub/Vine					
8				450–600	
	buckbrush	CECU	*Ceanothus cuneatus*	50–400	–
	roughleaf dogwood	CODR	*Cornus drummondii*	50–300	–
	winged sumac	RHCO	*Rhus copallinum*	50–300	–
	smooth sumac	RHGL	*Rhus glabra*	50–300	–
	blackberry	RUBUS	*Rubus*	50–300	–

	common buttonbush	CEOC2	*Cephalanthus occidentalis*	500–100	–
Tree					
9				249–300	
	common hackberry	CEOC	*Celtis occidentalis*	25–100	–
	white ash	FRAM2	*Fraxinus americana*	25–100	–
	eastern redcedar	JUVI	*Juniperus virginiana*	25–100	–
	Osage-orange	MAPO	*Maclura pomifera*	25–100	–
	American sycamore	PLOC	*Platanus occidentalis*	25–100	–
	bur oak	QUMA2	*Quercus macrocarpa*	25–100	–
	elm	ULMUS	*Ulmus*	25–100	–
	gum bully	SILAL3	*Sideroxylon lanuginosum ssp. lanuginosum*	25–50	–

Animal community

Numerous animal and bird species utilize this site as habitat. Small mammals, song birds, predators, along with traditional game species such as turkey, bobwhite quail, whitetail deer, mule deer, and others frequent this site. The combination of grasses, forbs, trees and woody shrubs that occur in the presumed historic plant community provide suitable habitat for all the above species, at least at some time during the year. Surface water, in the form of ponds, springs, and flowing streams provide water for species that require daily watering. Many different species move in and out of the site. Predators such as coyotes and bobcats may utilize the site for hunting prey and hiding during the day.

Hydrological functions

These sites occur on floodplains and drainageways on deep, alluvial soils. These areas receive run-on water from adjacent upland sites. Run off is usually slow due to the low slopes of the floodplain. The presence of deep rooted tallgrasses can help facilitate percolation of water into the soil profile.

Recreational uses

Hunting, Fishing, Camping, Hiking, Bird Watching, Photography, Horseback Riding, etc..

Wood products

There are limited wood products taken from this site. Trees can be used for most wood products indigenous to the species. Several species of trees are found on this site, but there is seldom any harvesting of wood products other than firewood for cooking, heat and fence posts.

Other products

Fruits, blackberries, other berries and pecans are harvested from this site.

Other information

NA

Inventory data references

The OK 551 Data Records are forms used in Oklahoma that preceded the 417 form. Data below is arranged in columns of:
Data Source Form Number: Number of Records: Sample Period: State: County:
551 5 1957 OK Osage
551 1 1958 OK Osage

551 4 1959 OK Osage
551 12 1960 OK Washington
551 1 1960 OK Osage
551 9 1961 OK Washington
551 1 1961 OK Osage
551 1 1962 OK Washington
551 5 1962 OK Osage
551 1 1962 OK Bryan
551 1 1963 OK Jefferson
551 3 1963 OK Washington
551 1 1963 OK Osage
551 2 1964 OK Washington
551 2 1964 OK Osage
551 3 1965 OK Osage
551 1 1965 OK Washington
551 1 1966 OK Washington
551 2 1966 OK Osage
417 1 1968 OK Osage
417 1 1971 OK Noble
417 1 1972 OK Grant

Type locality

Location 1: Lincoln County, OK	
General legal description	Lincoln County, Oklahoma; about 1 mile east of Harrah; about 4,000 feet south and 900 feet east of northwest corner of sec. 30, T. 12 N., R. 2 E

References

Scholtz, R. and . 2018. Grassland fragmentation and its influence on woody plant cover in the southern Great Plains, USA. Landscape Ecology 33:1785–1797.

Other references

This “Approved” site was included in an update project during 2013. The State&Transition model was re-formatted and the ESD was edited to fit the new ESIS format. The concepts and vegetative data contained therein was not altered. The entire ESD will be reviewed, updated, and subjected to the QC/QA processes as part of a future project. CW

USDA-NRCS (Formerly Soil Conservation Service) Range Site Descriptions (1960s)

USDA-NRCS (Formerly Soil Conservation Service) Ag Handbook 296 (2006)

Contributors

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Approval

Bryan Christensen, 9/19/2023

Acknowledgments

Site Development and Testing Plan

Future work, as described in a Project Plan, to validate the information in this Provisional Ecological Site Description is needed. This will include field activities to collect low, medium and high intensity sampling, soil correlations, and analysis of that data. Annual field reviews should be done by soil scientists and vegetation specialists. A final field review, peer review, quality control, and quality assurance reviews of the ESD will be needed to produce the final document.
Annual reviews of the Project Plan are to be conducted by the Ecological Site Technical Team.

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)	Mark Moseley, Kay Anderson, Jack Eckroat, Harry Fritzler, Steve Glasgow
Contact for lead author	100 USDA Suite 206 Stillwater, OK 74074
Date	04/01/2005
Approved by	Colin Walden
Approval date	
Composition (Indicators 10 and 12) based on	Annual Production

Indicators

1. **Number and extent of rills:** This site usually has flatter slopes. There are few, if any, rills (only in lowest area where flooding occurs) and there is no active headcutting and sides are covered with vegetation

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2. **Presence of water flow patterns:** There is some evidence of soil deposition or erosion (particularly after a flood event). Water generally flows evenly over the entire landscape.

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3. **Number and height of erosional pedestals or terracettes:** There should not be any evidence of erosional pedestals or terracettes on this site.

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4. **Bare ground from Ecological Site Description or other studies (rock, litter, lichen, moss, plant canopy are not bare ground):** There is 0-5% bare ground on this site. Bare areas are small and not connected.

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5. **Number of gullies and erosion associated with gullies:** Usually none. Most drainages are represented as natural stable channels; vegetation is common with no signs of erosion. Some nick points can occur where trees are uprooted from floods.

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6. **Extent of wind scoured, blowouts and/or depositional areas:** None

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7. **Amount of litter movement (describe size and distance expected to travel):** Uniform distribution of litter. Litter rarely moves >12 inches on flatter slopes and may be as much as doubled on steeper slopes, then only during high intensity storms.

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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):** Surface soil is stabilized (Stability Score 5 – 6). Stability scores based on a minimum of 6 samples tested.

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9. **Soil surface structure and SOM content (include type of structure and A-horizon color and thickness):** Ap horizon: 0 to 7 inches; dark grayish brown silt loam, weak fine granular structure. A horizon: 7 to 21 inches; dark grayish brown silt loam, moderate fine and medium granular structure.

   Refer to specific description for component sampled.

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10. **Effect of community phase composition (relative proportion of different functional groups) and spatial distribution on infiltration and runoff:** Infiltration and runoff are not affected by any changes in plant community composition and distribution. (Tallgrass dominated). Any changes in infiltration and runoff can be attributed to other factors (e.g. compaction)

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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):** There is usually no compaction layer.

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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: Tallgrasses Midgrasses

    Sub-dominant: Forbs Cool-Season Perennial Grasses

    Other: Shortgrasses, Shrubs, Trees

    Additional:

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13. **Amount of plant mortality and decadence (include which functional groups are expected to show mortality or decadence):** There is some plant mortality and decadence on the perennial grasses, especially in the absence of fire and herbivory, but usually <5%.

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14. **Average percent litter cover (%) and depth (in):** Litter should cover 50 - 75% of the area between plants with accumulations of .5 - 1 inches deep.

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15. **Expected annual annual-production (this is TOTAL above-ground annual-production, not just forage annual-production):** Reference production is 8,000-14,000 pounds per year.

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:** No invasive species. Invasives might include: eastern redcedar, locust, salt cedar, Russian olive, annuals and non-natives. Also mesquite in the south.

17. **Perennial plant reproductive capability:** All plants capable of reproducing at least every year. Seed stalks, stalk length and seedheads are numerous and what would be expected. Overall health of plants is what would be expected.