USDA Natural Resources Conservation Service

Ecological site R055BY067ND
Choppy Sands

Accessed: 05/11/2025

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.

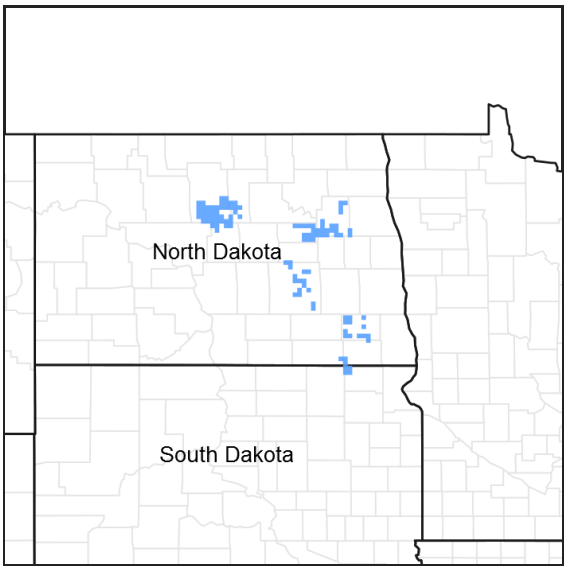


Figure 1. Mapped extent

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.

Classification relationships

Level IV Ecoregions of the Conterminous United States: 42a – Missouri Coteau; 42b – Collapsed Glacial Outwash; 42c – Missouri Coteau Slope; 42d – Northern Missouri Coteau; 42f – Southern Missouri Coteau Slope; 42g – Ponca Plains; and 42h – Southern River Breaks.

Associated sites

R055BY061ND	**Sands**
R055BY062ND	**Sandy**

Similar sites

R055BY061ND	**Sands** (053BY061ND – Sands (Sa) [Does not receive additional moisture. Found on dry uplands, upslope from Loamy Overflow site, down slope from Thin Upland or Shallow Loamy sites. Similar landscape position as Loamy, Sandy, and Clayey sites. Won't form a ribbon; indicator species are sand bluestem and prairie sandreed evenly mixed, some Canada wildrye, penstemon, and leadplant and western snowberry. This site has more production, thicker "A" horizon and a mollic epipedon, less needleandthread, less choppy landscape.]

R055BY062ND	**Sandy** (055BY062ND) – Sandy (Sy) [Does not receive additional moisture. Found on dry uplands upslope from Loamy Overflow sites, down slope from Choppy Sands sites. Similar landscape position as Loamy and Sands sites; will ribbon up to 1 inch. Indicator species are prairie sandreed with western wheatgrass and green needlegrass intermixed. This site has less sand bluestem and prairie sandreed; more sideoats grama, green needlegrass and western wheatgrass, less production, flatter landscape position, different soil texture.]

Table 1. Dominant plant species

Tree	Not specified
Shrub	Not specified
Herbaceous	(1) *Andropogon hallii* (2) *Calamovilfa longifolia*

Physiographic features

This site typically occurs on gently rolling to strongly sloping uplands

Table 2. Representative physiographic features

Landforms	(1) Lake plain
Flooding frequency	None
Ponding frequency	None
Elevation	1,000–2,100 ft
Slope	0–45%
Water table depth	60–80 in
Aspect	Aspect is not a significant factor

Climatic features

MLRA 55B is considered to have a continental climate – cold winters and hot summers, low humidity, light rainfall, and much sunshine. Extremes in temperature are characteristic. The climate is the result of this MLRA’s location in the geographic center of North America. There are few natural barriers on the northern Great Plains. The air masses move unobstructed across the plains and account for rapid changes in temperature.

Annual precipitation ranges from 16 to 21 inches per year. The normal average annual temperature is about 41.5° F. January is the coldest month with average temperatures ranging from about 2° F (Maddock, ND) to about 11° F (Mellette, SD). July is the warmest month with temperatures averaging from about 67° F (Maddock, ND) to about 73° F (Redfield 2 NE, SD). The range of normal average monthly temperatures between the coldest and warmest months is about 64° F. This large annual range attests to the continental nature of this MLRA's climate. Winds average about 11 miles per hour annually, ranging from about 13 miles per hour during the spring to about 10 miles per hour during the summer. Daytime winds are generally stronger than nighttime and occasional strong storms may bring brief periods of high winds with gusts to more than 50 miles per hour.

Growth of native cool-season plants begins in late March and continues to early to mid July. Native warm-season plants begin growth in mid May and continue to the end of August. Green up of cool-season plants can occur in September and October when adequate soil moisture is present.

Table 3. Representative climatic features

Frost-free period (average)	140 days
Freeze-free period (average)	161 days
Precipitation total (average)	21 in

Influencing water features

No significant water features influence this site.

Soil features

These soils are deep to very deep, somewhat excessive to excessively drained, and coarse textured. Saturated hydraulic conductivity is rapid to very rapid and available water capacity is very low to moderate. Salinity and sodicity is none. This site is on side slopes and ridges on moderately sloping to very steep eolian sands. Slope ranges from 0 to 45 percent. It is not uncommon to have pedestalling of plants due to the inherent instability of the soils. Water flow paths are broken, irregular in appearance or discontinuous. There is a risk of rills and eventually gullies if vegetative cover is not adequate. Wind erosion is the greatest risk.

Major soil series correlated to this ecological site can be found in Section II of the Natural Resources Conservation Service Field Office Technical Guide or the following web site:
http://www.nrcs.usda.gov/technical/efotg/

Table 4. Representative soil features

Surface texture	(1) Loamy sand (2) Loamy fine sand
Family particle size	(1) Sandy
Drainage class	Excessively drained
Permeability class	Moderately rapid to very rapid
Soil depth	80 in
Surface fragment cover <=3"	0–5%
Surface fragment cover >3"	0%
Available water capacity (0-40in)	3 in
Calcium carbonate equivalent (0-40in)	0–10%
Electrical conductivity (0-40in)	0–2 mmhos/cm
Sodium adsorption ratio (0-40in)	0
Soil reaction (1:1 water) (0-40in)	6.1–8.4
Subsurface fragment volume <=3" (Depth not specified)	0–25%
Subsurface fragment volume >3" (Depth not specified)	0–5%

Ecological dynamics

The site developed under Northern Great Plains climatic conditions, and included natural influence of large herding herbivores and frequent fire. Changes will occur in the plant communities due to weather fluctuations and/or management actions. Under adverse impacts, a slow decline in vegetative vigor and composition will occur. Under favorable conditions the site has the potential to resemble the reference state. Interpretations for this site are based on the Reference State. The Reference State has been determined by study of rangeland relic areas, areas protected from excessive disturbance, and areas under long-term rotational grazing regimes. Trends in plant community dynamics ranging from heavily grazed to lightly grazed areas, seasonal use pastures, and historical accounts also have been considered. Community phases, community pathways, states, transitions, thresholds and restoration pathways have been determined through similar studies and experience.

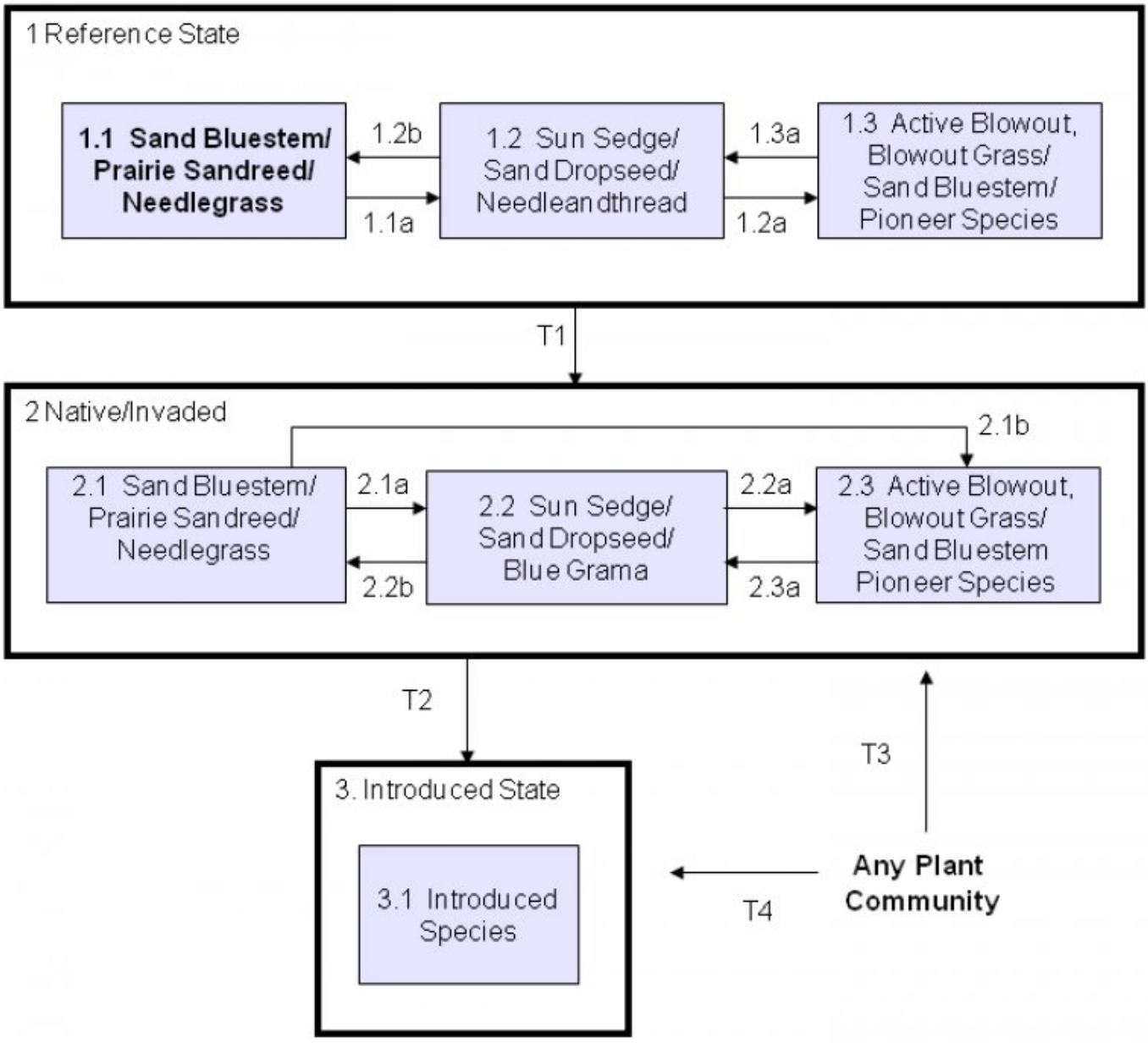
The natural disturbance regime consisted of frequent fires caused both by natural and Native American ignition sources. These fires occurred during any season of the year, but were concentrated in the spring and late summer or early fall. Lightening fires occurred most frequently in July and August while fires started by Native Americans occurred in April, September and October. Large ungulate grazing was heavy and occurred often, but usually for short durations. Grazing may have been severe when occurring after a fire event. The grazing and fire interaction especially when coupled with drought events, set up the dynamics discussed and displayed in the following state and transition diagram and descriptions.

This ecological site has been grazed by domestic livestock since introduced into the area. The introduction of domestic livestock and the use of fencing and reliable water sources have radically changed the disturbance regime of this site. Heavy continuous grazing and/or continuous seasonal (spring) grazing, without adequate recovery periods following each grazing occurrence causes this site to depart from the reference plant community. Species such as needleandthread, blue grama and threadleaf sedge will initially increase. Species such as sand bluestem and prairie sandreed decrease in frequency and production. In time, heavy continuous grazing will likely cause blue grama, sand dropseed and threadleaf sedge to dominate and other pioneer perennials and annuals to increase. The decrease in surface cover will elevate soil surface temperatures and evapotranspiration rates will increase.

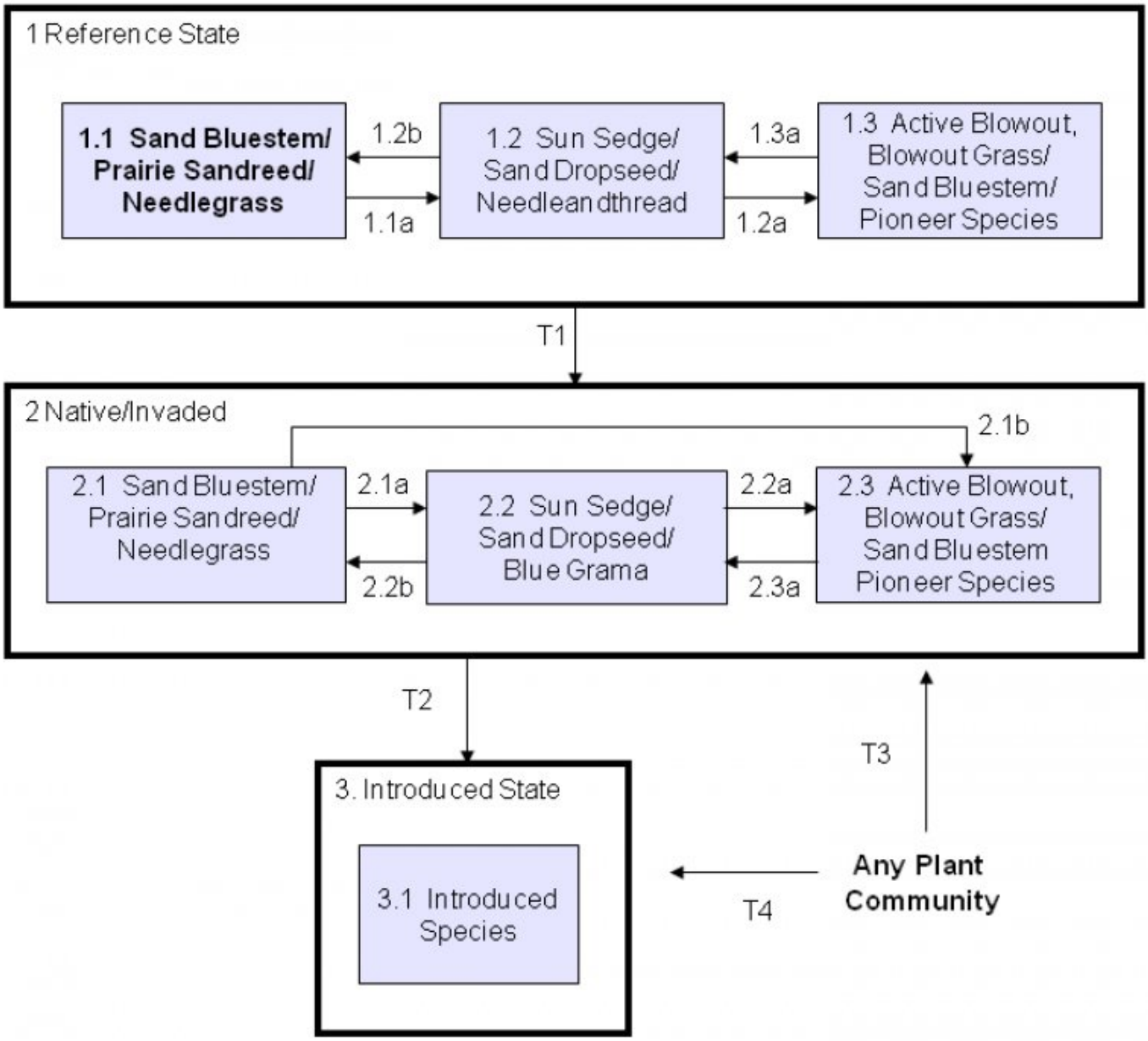
Heavy disturbance through improper grazing, wildfire, excessive defoliation or any type of physical disturbance (i.e. off road vehicle) can lead to serious erosion problems (blowout) on these fragile soils. Extended periods of non-use and/or lack of fire will result in a plant community having litter levels higher than expected for the site. This will favor an increase in Kentucky bluegrass and/or smooth bromegrass as well as shrubs species such as western snowberry. Remnant native plants may be present but are reduced in vigor.

Following the state and transition diagram are narratives for each of the described states and community phases. These may not represent every possibility, but they are the most prevalent and repeatable states/community phases. The plant composition tables shown below have been developed from the best available knowledge at the time of this revision. As more data are collected, some of these community phases and/or states may be revised or removed, and new ones may be added. The main purpose for including the descriptions here is to capture the current knowledge and experience at the time of this revision.

State and transition model



1.1a – Periods of below normal precipitation; **1.2a** – Periods of prolonged drought and/or animal concentration; **1.2b, 1.3a** – Return to normal precipitation and disturbance regime; **T1** – Introduction of non-native species; **2.1a** – Season-long grazing and/or periods of below normal precipitation; **2.1b** – Excessive disturbance i.e. livestock concentration or off-road vehicle use - **2.2a** – Heavy, season-long grazing and/or prolonged drought; **2.2b** – Prescribed grazing, **2.3a** – Prescribed grazing and return to normal precipitation; T2 – Non-use, no fire; T3 – Range seeding with prescribed grazing, T4 – Cropped go-back with continuous grazing



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State 1
Reference

This state represents the natural range of variability that dominated the dynamics of this ecological site. This state was dominated by warm- and cool-season grasses. The primary disturbance mechanisms for this site in the reference condition included frequent fire and grazing by large herding ungulates. Timing of fires and grazing coupled with weather events dictated the dynamics that occurred within the natural range of variability. Mid and tall stature grass species can decline and a corresponding increase in short stature warm-season grasses and cool-season grass-like species will occur. Slight shifts would have occurred in the timing of energy capture, hydrologic function and nutrient cycling between plant community phases 1.1 and 1.2 within State 1. Hydrologic function, energy capture and nutrient cycling would have been reduced in community phase 1.3 but would not have departed beyond the point of recovery.

Community 1.1
Sand Bluestem/Prairie Sandreed/Needlegrass

This community phase was the most dominant both temporally and spatially. The prevailing climate and weather patterns favored the development of this community phase. Tall statured warm-season grasses such as sand bluestem and prairie sandreed would have been co-dominant with mid statured cool-season bunchgrass such as needleandthread and porcupine grass. Other grasses and grass-likes species would have included little bluestem, Canada wildrye, sand dropseed, prairie Junegrass, blue grama, and sedge. A variety of leguminous and non-leguminous perennial forbs including bracted spiderwort, dotted gayfeather, goldenrod, green sagewort, hairy goldaster, silky purple prairie clover and sunflower were present. Shrubs included fringed sagewort, leadplant and rose. In this community phase, grasses and grass-likes would have constituted about 85 to 95 percent, forbs 5 to 10 percent and shrub 1 to 5 percent of the annual production. This represents the plant community phase upon which interpretations are primarily based and is described in the “Plant Community Composition and Group Annual Production” portion of this ecological site description. Community dynamics, nutrient cycling, water cycle and energy flow were functioning at near optimum levels. A good component of bunchgrasses, minimal bare ground, litter in contact with the soil surface, soil texture and deep rooted plants would have resulted in high infiltration rates and minimal runoff. Due to the balance between warm and cool season grasses, energy capture would have been spread across the entire growing season. Natural plan mortality was low. The diversity in plant species allowed for high drought tolerance.

Table 5. Annual production by plant type

Plant Type	Low (Lb/Acre)	Representative Value (Lb/Acre)	High (Lb/Acre)
Grass/Grasslike	1300	1784	2270
Shrub/Vine	100	158	215
Forb	100	158	215
Total	**1500**	**2100**	**2700**

Figure 5. Plant community growth curve (percent production by month). ND5503, Central Black Glaciated Plains, cool-season/warm-season co-dominant.. Cool-season, warm-season co-dominant..

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0	0	2	6	21	40	20	6	4	1	0	0

Community 1.2
Sun Sedge/Sand Dropseed/Needleandthread

This plant community shift results from heavy, frequent grazing over a period of several years and/or several consecutive years of below normal precipitation. This increase in grazing pressure may have resulted from proximity to a water source, changes in fire frequency and/or prolonged drought. Grasses and grass-like species would have still dominated this phase but the overall productivity of these species would have been reduced and the number and amount of forbs would have increased. Needleandthread would have displaced porcupine grass to become the dominate needlegrass while blue grama, sand dropseed and sedges would have also increased. Prairie sandreed and the bluestems would have decreased but still have been present. Forb species such as green sagewort, goldenrod, western ragweed, western yarrow and prairie coneflower would have increased. The shift to

the shallower rooted, short statured blue grama and sedges coupled with an increase in bare ground results in higher soil surface temperatures as compared to plant community phase 1.1. Due to soil texture, infiltration rates would have been similar to community phase 1.1. While the timing of energy capture would have remained similar to that of plant community phase 1.1, total energy capture may have been slightly reduced due to a decrease in overall leaf area.

Figure 6. Plant community growth curve (percent production by month). ND5502, Central Black Glaciated Plains, cool-season dominant, warm-season sub-dominant.. Cool-season dominant, warm-season sub-dominant..

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0	0	3	7	23	42	15	5	4	1	0	0

Community 1.3
Active Blowout/Blowout Grass/Sand Bluestem/Pioneer Species

This plant community phase was not stable. It consisted of bare areas that were continually eroded by wind. Vegetation was spare and scattered. Patches of sand bluestem would have been scattered across the site with blowout grass and other pioneer perennial and annual species comprising the majority of the vegetation. Bare ground was common and with active wind erosion very evident. Soil deposition on leeward side of blowouts was common.

Pathway 1.1a
Community 1.1 to 1.2

Repeated heavy grazing either due to proximity to water or following short term fire intervals followed by intense grazing will reduce the dominance of tall warm-season grasses and shift the competitive advantage to the more grazing tolerant mid statured cool-season bunchgrasses such as needleandthread and sand dropseed and short statured grass-likes and warm-season short statured grasses like blue grama. This shift may have been facilitated by periods of below normal precipitation.

Pathway 1.2b
Community 1.2 to 1.1

A return to normal precipitation patterns, grazing and fire regime allows for recovery of tall statured warm-season species and mid statured cool-season porcupine grass.

Pathway 1.2a
Community 1.2 to 1.3

Excessive disturbances such as heavy grazing due to proximity to a perennial water source and/or prolonged drought would have significantly reduced perennial plant cover, reduced soil surface cover and increased basal gap distance. This, coupled with the repeated disturbances, would have increased the amount of soil erosion due to wind resulting in a “blowout” condition.

Pathway 1.3a
Community 1.3 to 1.2

Several years of above normal precipitation and a reduction or elimination of the grazing disturbance would have allowed the sand bluestem, blowout grass and pioneer annuals and perennials to increase in number and extent. This additional cover would begin to alter the wind patterns at the soil surface and the site/community would shift toward community phase 1.2.

State 2
Native/Invaded

This state is similar to the reference state in appearance and function. The invasion of introduced cool-season sodgrasses has altered the natural range of variability for this ecological site. This state still has a strong component

of warm and cool season grass species, but invasive introduced cool-season sodgrasses are now present in all community phases of this state. The primary disturbance mechanisms for this state include grazing by domestic livestock and infrequent fires.

Community 2.1
Sand Bluestem/Prairie Sandreed/Needlegrass

This community phase most closely resembles plant phase 1.1 in appearance and ecological function (e.g., hydrologic, biotic and soil/site stability). This community is maintained with grazing systems that allow for adequate recovery periods following grazing events, and potentially the combination of grazing and prescribed burning which closely mimics the natural disturbance regime. Tall statured warm-season grasses such as sand bluestem and prairie sandreed are co-dominant with mid statured cool-season bunchgrass such as needleandthread and porcupine grass. Other grasses and grass-likes species include little bluestem, Canada wildrye, sand dropseed, prairie Junegrass, blue grama, and sedge. Trace amounts of Kentucky bluegrass and/or smooth bromegrass are also present. A variety of leguminous and non-leguminous perennial forbs including bracted spiderwort, dotted gayfeather, goldenrod, green sagewort, hairy goldaster, silky purple prairie clover and sunflower are present. Shrubs include fringed sagewort, leadplant and rose. In this community phase, grasses and grass-likes constitute about 85 to 95 percent, forbs 5 to 10 percent and shrub 1 to 5 percent of the annual production. The basic difference between this community phase and 1.1 of the Reference State is the presence of minor amounts of introduced cool-season grasses and forbs. The ecological processes are functioning at levels very close to those of plant community phase 1.1. Slight departure may be noted within the functional/structural indicator due to the presence of a functional/structural group(s) not expected for the site.

Table 6. Annual production by plant type

Plant Type	Low (Lb/Acre)	Representative Value (Lb/Acre)	High (Lb/Acre)
Grass/Grasslike	1300	1784	2270
Shrub/Vine	100	158	215
Forb	100	158	215
Total	**1500**	**2100**	**2700**

Figure 8. Plant community growth curve (percent production by month). ND5503, Central Black Glaciated Plains, cool-season/warm-season co-dominant.. Cool-season, warm-season co-dominant..

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0	0	2	6	21	40	20	6	4	1	0	0

Community 2.2
Sun Sedge/Sand Dropseed/Blue Grama

Grasses and grass-like species still dominate this phase but the overall productivity of these species is reduced and the number and amount of forbs has increased. Prairie sandreed, sand bluestem and porcupine grass decrease but are still present. Short statured grasses and grass-likes as well as sand dropseed and Kentucky bluegrass increase in amount and extent. Forbs such as green sagewort, goldenrod, western ragweed, western yarrow and prairie coneflower also increase. The shift to the shallower rooted, short statured blue grama and sedges coupled with an increase in bare ground results in higher soil surface temperatures as compared to plant community phase 1.1. Due to soil texture, infiltration rates would be similar to community phase 1.1. While the timing of energy capture would remain similar to that of plant community phase 1.1, total energy capture is slightly reduced due to a decrease in overall leaf area.

Figure 9. Plant community growth curve (percent production by month). ND5503, Central Black Glaciated Plains, cool-season/warm-season co-dominant.. Cool-season, warm-season co-dominant..

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0	0	2	6	21	40	20	6	4	1	0	0

Community 2.3
Active Blowout/Blowout Grass/Sand Bluestem/Pioneer Species

This plant community phase is not stable. It consists of bare areas that were continually eroded by wind. Vegetation is spare and scattered. Patches of sand bluestem may be scattered across the site with blowout grass and other pioneer perennial and annual species like sandbur comprising the majority of the vegetation. Bare ground is common and with active wind erosion very evident. Soil deposition on leeward side of blowouts is common.

Pathway 2.1a
Community 2.1 to 2.2

Heavy continuous grazing or heavy late seasonal grazing will shift the competitive advantage away from the tall warm-season rhizomatous grasses and mid statured cool-season bunchgrasses to more grazing tolerant short statured grasses and grass-likes. Periods of below normal precipitation will intensify the impact of the grazing and further facilitate this transition. Prolonged periods of drought would also result in this shift, with or without the grazing pressure.

Pathway 2.2b
Community 2.2 to 2.1

This community pathway is initiated by implementation of prescribed grazing management which includes adequate recovery periods following each grazing event, and stocking levels which match the available resources. If properly implemented, this will shift the competitive advantage away from the introduced cool-season species and back to the tall statured warm-season rhizomatous grasses mid statured porcupine grass. The addition of properly timed prescribed burning may expedite this shift.

Pathway 2.2a
Community 2.2 to 2.3

Excessive disturbances such as heavy grazing due to proximity to a perennial water source or off road vehicle use and/or prolonged drought would significantly reduce perennial plant cover, reduce soil surface cover and increase basal gap distance. This, coupled with the repeated disturbances, increases the amount of soil erosion due to wind resulting in a “blowout” condition.

Pathway 2.3a
Community 2.3 to 2.2

Implementation of prescribed grazing management which includes adequate recovery periods following each grazing event, and stocking levels which match the available resources will allow the remaining vegetation to re-colonize and stabilize the site. Depending upon the level of grazing management, complete deferment of the site for a couple of growing seasons may be necessary to speed the transition. Variation in seasonal precipitation may speed or delay recovery.

State 3
Introduced

This state is the result of invasion and dominance of Kentucky bluegrass and/or other non-native grasses and forbs. Once the state is well established, even drastic events such as high intensity fires driven by high fuel loads of litter and thatch will not result in more than a very short term reduction of the non-native species. These events may reduce the dominance of the sodgrasses, but due to the large amount of rhizomes in the soil there is no opportunity for the native species to establish and dominate before the sodgrasses rebound and again dominate the system.

Community 3.1
Introduced Species

Although remnant populations of native grasses such as prairie junegrass and forbs such as green sagewort still

occupy this plant community phase, it is dominated by non-native species, primarily Kentucky bluegrass. The impact of transition from a diverse native plant community to an introduced cool-season rhizomatous dominated community is a reduction in infiltration, and shift to an early to mid spring energy capture timeframe and a reduction in nutrient cycling. Due to soil texture and the droughty nature of the soils, this site is not as prone to the formation of a tight Kentucky bluegrass sod like more productive sites. However, once established, this plant community phase is very resistant to change and resilient to disturbances. Since Kentucky bluegrass is not a very drought tolerant species, periods of long term severe drought may result in this community shifting to something resembling plant community phase 2.3. However, once normal moisture patterns are restored, the resilient Kentucky bluegrass will recover and once again, dominate the site.

Figure 10. Plant community growth curve (percent production by month). ND5501, Central Black Glaciated Plains, cool-season dominant. Cool-season dominant..

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0	0	3	8	24	45	10	3	5	2	0	0

Transition T1
State 1 to 2

This is the transition from the native grass dominated reference state to a state that has been invaded by introduced cool-season grass species. When propagules of Kentucky bluegrass are present, this transition occurs as natural and/or management actions favor a decline in the composition of warm season rhizomatous grasses and cool season bunch grasses and an increase in cool-season sodgrasses. This transition is compounded by a change in the historic grazing and fire regime where native herbivores would follow periodic fires with grazing. This historic grazing/fire sequence has largely been replaced chronic season-long or heavy late season grazing. Complete rest from grazing and suppression of fire can also lead to this transition. The threshold between states is crossed when Kentucky bluegrass, smooth brome, and other introduced species become established on the site. These species typically are part of functional/structural groups that were not present in the Reference State.

Transition T2
State 2 to 3

Complete rest from grazing and elimination of fire are the two major contributors to this transition, especially when Kentucky bluegrass is present. Plant litter accumulation at the base of the native plants reduces vigor of the warm season species and shifts the competitive advantage to the more shade tolerant introduced grass species. Studies indicate that soil biological activity is altered, and this shift apparently exploits the soil microclimate and encourages growth of the introduced grass species. Once the threshold is crossed, a change in grazing management alone cannot cause a reduction in sodgrass dominance. Preliminary studies would tend to indicate this threshold may exist when Kentucky bluegrass exceeds 30% of the plant community and native grasses represent less than 40% of the plant community composition.

Restoration pathway R4
State 2 to 3

It may be possible using selected introduced and/or plant materials and agronomic practices to approach something very near the functioning of the Native/Invaded State (State 2). Application of chemical herbicides and the use of mechanical seeding methods using adapted varieties of the dominant native grasses are possible and can be successful. After establishment, management objectives must include the maintenance of the established species, the associated reference state functions and continued treatment to maintain the vigor of the stand. Application of long termed prescribed grazing and prescribed burning may be the most effective management strategies for maintaining the site in State 2.

Restoration pathway R3
State 3 to 2

It may be possible using selected native plant materials and agronomic practices to approach something very near the functioning of the Native/Invaded State (State 2). Application of chemical herbicides and the use of mechanical

seeding methods using adapted varieties of the dominant native grasses are possible and can be successful. After establishment of the native grasses, management objectives must include the maintenance of those species, the associated reference state functions and continued treatment of the introduced sodgrasses. Application of long termed prescribed grazing and prescribed burning may be the most effective management strategies for maintaining the site in State 2.

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	**Tall Warm-season Grasses**			315–525	
	sand bluestem	ANHA	*Andropogon hallii*	315–420	–
	prairie sandreed	CALO	*Calamovilfa longifolia*	210–315	–
2	**Cool-season Bunchgrasses**			105–315	
	needle and thread	HECOC8	*Hesperostipa comata ssp. comata*	210–315	–
	porcupinegrass	HESP11	*Hesperostipa spartea*	21–63	–
	Canada wildrye	ELCA4	*Elymus canadensis*	21–42	–
3	**Mid Warm-season Grasses**			210–315	
	little bluestem	SCSC	*Schizachyrium scoparium*	105–210	–
	sand dropseed	SPCR	*Sporobolus cryptandrus*	21–105	–
	sideoats grama	BOCU	*Bouteloua curtipendula*	42–105	–
4	**Short Warm-season Grasses**			21–105	
	blue grama	BOGR2	*Bouteloua gracilis*	42–105	–
	hairy grama	BOHI2	*Bouteloua hirsuta*	0–63	–
5	**Other Native Grasses**			21–105	
	Grass, native	2GN	*Grass, native*	42–105	–
	prairie Junegrass	KOMA	*Koeleria macrantha*	21–63	–
	Scribner's rosette grass	DIOLS	*Dichanthelium oligosanthes var. scribnerianum*	21–42	–
6	**Grass-likes**			105–210	
	Grass-like (not a true grass)	2GL	*Grass-like (not a true grass)*	21–105	–
	sun sedge	CAINH2	*Carex inops ssp. heliophila*	42–105	–
	Schweinitz's flatsedge	CYSC3	*Cyperus schweinitzii*	0–21	–
Forb					
7	**Forbs**			105–210	
	longbract spiderwort	TRBR	*Tradescantia bracteata*	21–63	–
	field sagewort	ARCA12	*Artemisia campestris*	21–63	–
	white sagebrush	ARLU	*Artemisia ludoviciana*	21–63	–
	Forb, perennial	2FP	*Forb, perennial*	21–63	–
	rush skeletonplant	LYJU	*Lygodesmia juncea*	21–42	–
	goldenrod	SOLID	*Solidago*	0–42	–
	blazing star	LIATR	*Liatris*	21–42	–
	silky prairie clover	DAVI	*Dalea villosa*	21–42	–
	smooth horsetail	EQLA	*Equisetum laevigatum*	21–42	–

	sanddune wallflower	ERCAC	*Erysimum capitatum var. capitatum*	21–42	–
	flat-top goldentop	EUGR5	*Euthamia graminifolia*	0–42	–
	common sunflower	HEAN3	*Helianthus annuus*	0–42	–
	stiff sunflower	HEPA19	*Helianthus pauciflorus*	21–42	–
	Cuman ragweed	AMPS	*Ambrosia psilostachya*	21–42	–
	hairy false goldenaster	HEVI4	*Heterotheca villosa*	0–21	–
	milkweed	ASCLE	*Asclepias*	0–21	–
	spotted sandmat	CHMA15	*Chamaesyce maculata*	0–21	–
	thymeleaf sandmat	CHSES	*Chamaesyce serpyllifolia ssp. serpyllifolia*	0–21	–
	hoary puccoon	LICA12	*Lithospermum canescens*	0–21	–
	narrowleaf stoneseed	LIIN2	*Lithospermum incisum*	0–21	–
	Lewis flax	LILE3	*Linum lewisii*	0–21	–
	onion	ALLIU	*Allium*	0–21	–
Shrub/Vine					
8	**Shrubs**			105–210	
	leadplant	AMCA6	*Amorpha canescens*	21–42	–
	prairie sagewort	ARFR4	*Artemisia frigida*	21–42	–
	hawthorn	CRATA	*Crataegus*	0–21	–
	western sandcherry	PRPUB	*Prunus pumila var. besseyi*	0–21	–
	chokecherry	PRVI	*Prunus virginiana*	0–21	–
	sumac	RHUS	*Rhus*	0–21	–
	currant	RIBES	*Ribes*	0–21	–
	rose	ROSA5	*Rosa*	0–21	–
	blackberry	RUBUS	*Rubus*	0–21	–
	prairie willow	SAHU2	*Salix humilis*	0–21	–
	snowberry	SYMPH	*Symphoricarpos*	0–21	–
	western poison ivy	TORY	*Toxicodendron rydbergii*	0–21	–
	common pricklyash	ZAAM	*Zanthoxylum americanum*	0–21	–
	Shrub (>.5m)	2SHRUB	*Shrub (>.5m)*	0–21	–
	Saskatoon serviceberry	AMAL2	*Amelanchier alnifolia*	0–21	–

Table 8. Community 2.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production (Lb/Acre)	Foliar Cover (%)
Grass/Grasslike					
1	**Tall Warm-season Grasses**			315–525	
	sand bluestem	ANHA	*Andropogon hallii*	315–420	–
	prairie sandreed	CALO	*Calamovilfa longifolia*	210–315	–
2	**Cool-season Bunchgrasses**			105–315	
	needle and thread	HECOC8	*Hesperostipa comata ssp. comata*	210–315	–
	porcupinegrass	HESP11	*Hesperostipa spartea*	21–63	–
	Canada wildrye	ELCA4	*Elymus canadensis*	21–42	–
3	**Mid Warm-season Grasses**			210–315	
	little bluestem	SCSC	*Schizachyrium scoparium*	105–210	–

	sand dropseed	SPCR	*Sporobolus cryptandrus*	21–105	–
	sideoats grama	BOCU	*Bouteloua curtipendula*	42–105	–
4	**Short Warm-season Grasses**			21–105	
	blue grama	BOGR2	*Bouteloua gracilis*	42–105	–
	hairy grama	BOHI2	*Bouteloua hirsuta*	0–63	–
5	**Other Native Grasses**			21–105	
	Grass, native	2GN	*Grass, native*	42–105	–
	prairie Junegrass	KOMA	*Koeleria macrantha*	21–63	–
	Scribner's rosette grass	DIOLS	*Dichanthelium oligosanthes var. scribnerianum*	21–42	–
6	**Grass-likes**			105–210	
	Grass-like (not a true grass)	2GL	*Grass-like (not a true grass)*	21–105	–
	sun sedge	CAINH2	*Carex inops ssp. heliophila*	42–105	–
	Schweinitz's flatsedge	CYSC3	*Cyperus schweinitzii*	0–21	–
7	**Non-Native Grasses**			21–63	
	Kentucky bluegrass	POPR	*Poa pratensis*	21–42	–
	Grass, perennial	2GP	*Grass, perennial*	0–21	–
Forb					
8	**Forbs**			105–210	
	longbract spiderwort	TRBR	*Tradescantia bracteata*	21–63	–
	field sagewort	ARCA12	*Artemisia campestris*	21–63	–
	white sagebrush	ARLU	*Artemisia ludoviciana*	21–63	–
	Forb, perennial	2FP	*Forb, perennial*	21–63	–
	rush skeletonplant	LYJU	*Lygodesmia juncea*	21–42	–
	goldenrod	SOLID	*Solidago*	0–42	–
	blazing star	LIATR	*Liatris*	21–42	–
	silky prairie clover	DAVI	*Dalea villosa*	21–42	–
	smooth horsetail	EQLA	*Equisetum laevigatum*	21–42	–
	sanddune wallflower	ERCAC	*Erysimum capitatum var. capitatum*	21–42	–
	flat-top goldentop	EUGR5	*Euthamia graminifolia*	0–42	–
	common sunflower	HEAN3	*Helianthus annuus*	0–42	–
	stiff sunflower	HEPA19	*Helianthus pauciflorus*	21–42	–
	Cuman ragweed	AMPS	*Ambrosia psilostachya*	21–42	–
	hairy false goldenaster	HEVI4	*Heterotheca villosa*	0–21	–
	milkweed	ASCLE	*Asclepias*	0–21	–
	spotted sandmat	CHMA15	*Chamaesyce maculata*	0–21	–
	thymeleaf sandmat	CHSES	*Chamaesyce serpyllifolia ssp. serpyllifolia*	0–21	–
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	Shrub (>.5m)	2SHRUB	*Shrub (>.5m)*	0–21	–
	Saskatoon serviceberry	AMAL2	*Amelanchier alnifolia*	0–21	–

Animal community

Animal Community – Grazing Interpretations
This site is well adapted to managed grazing by domestic livestock. The predominance of herbaceous plants across all plant community phases best lends these sites to grazing by cattle but other domestic grazers with differing diet preferences may also be a consideration depending upon management objectives. Often, the current plant community does not entirely match any particular plant community (as described in the ecological site description). Because of this, a resource inventory is necessary to document plant composition and production. Proper interpretation of this inventory data will permit the establishment of a safe, initial stocking rate for the type and class of animals and level of grazing management. More accurate stocking rate estimates should eventually be calculated using actual stocking rate information and monitoring data.

Hydrological functions

Water is the principal factor limiting herbage production on this site. The site is dominated by soils in hydrologic group A. Infiltration varies from rapid to very rapid and runoff potential varies from negligible to very low depending on soil hydrologic group and ground cover. In many cases, areas with greater than 75% ground cover have the greatest potential for high infiltration and lower runoff. Areas where ground cover is less than 50% have the greatest potential to have reduced infiltration and higher runoff (refer to Section 4, NRCS National Engineering Handbook for runoff quantities and hydrologic curves).

Recreational uses

This site provides hunting opportunities for upland game species. The wide variety of plants which bloom from spring until fall have an esthetic value that appeals to visitors.

Wood products

No appreciable wood products are present on the site.

Other products

Seed harvest of native plant species can provide additional income on this site.

Inventory data references

Information presented here has been derived from NRCS and other federal/state agency clipping and inventory data. Also, field knowledge of range-trained personnel was used. All descriptions were peer reviewed and/or field-tested by various private, state and federal agency specialists. Those involved in developing this site description include: Stan Boltz, NRCS Range Management Specialist; Michael D. Brand, State Land Dept., Director Surface Management; David Dewald, NRCS State Biologist; Paul Drayton, NRCS District Conservationist; Jody Forman, NRCS Range Management Specialist; Dennis Froemke, NRCS Range Management Specialist; Jeff Printz, NRCS State Range Management Specialist; Kevin Sedivec, Extension Rangeland Management Specialist; Shawn Dekeyser, North Dakota State University; Rob Self, The Nature Conservancy and Lee Voigt, NRCS Range Management Specialist.

Other references

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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)	Jeff Printz, Stan Boltz, Lee Voigt, Jody Forman
Contact for lead author	Jeff.printz@nd.usda.gov 701-530-2080
Date	02/10/2012
Approved by	Jeff Printz
Approval date	
Composition (Indicators 10 and 12) based on	Annual Production

Indicators

1. **Number and extent of rills:** Few rills visible, short (6 to 8 inches in length) and associated with steeper slopes. Generally visible following severe rainfall events.

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2. **Presence of water flow patterns:** Few. Very short (2 to 3 feet) and disconnected.

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3. **Number and height of erosional pedestals or terracettes:** Bunchgrasses may be pedestalled but roots will not be exposed.

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4. **Bare ground from Ecological Site Description or other studies (rock, litter, lichen, moss, plant canopy are not bare ground):** 10 to 15% occurring in small (6 inches or less), non-connected patches.

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5. **Number of gullies and erosion associated with gullies:** None.

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6. **Extent of wind scoured, blowouts and/or depositional areas:** Not present in community phase 1.1. Blowouts and associated depositional areas may be present but limited in size following long term drought.

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7. **Amount of litter movement (describe size and distance expected to travel):** None. Short movement (several inches) may be visible in association with water flow patterns.

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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):** Soil aggregate stability should be 5 or greater. Aggregate stability

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9. **Soil surface structure and SOM content (include type of structure and A-horizon color and thickness):** Use soil series description for depth, color and structure of A horizon/surface layer.

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10. **Effect of community phase composition (relative proportion of different functional groups) and spatial distribution on infiltration and runoff:** Combination of shallow and deep rooted species (mid & tall rhizomatous and tufted perennial cool- and warm-season grasses) with fine and coarse roots positively influences infiltration.

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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):** None.

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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: Tall warm-season grasses >

    Sub-dominant: Mid cool-season bunchgrasses = mid warn-season grasses >

    Other: Grass-likes = forbs = shrubs > short warm season grasses > trees > short cool-season grasses

    Additional: Due to differing root structure and distribution, Kentucky bluegrass and smooth bromegrass do not fit into reference plant community F/S groups.

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13. **Amount of plant mortality and decadence (include which functional groups are expected to show mortality or decadence):** None.

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14. **Average percent litter cover (%) and depth (in):** In contact with soil surface.

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15. **Expected annual annual-production (this is TOTAL above-ground annual-production, not just forage annual-production):** Representative value = 1900 lbs/ac air dry with a range of 1300 to 2500 lbs./acre air dry depending upon growing conditions.

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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:** State/local noxious weeds , Kentucky bluegrass, smooth bromegrass

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17. **Perennial plant reproductive capability:** All species exhibit high vigor relative to climatic conditions. Do not rate based solely on seed production. Perennial grasses should have vigorous rhizomes or tillers.
