

## United States Department of Agriculture Natural Resources Conservation Service

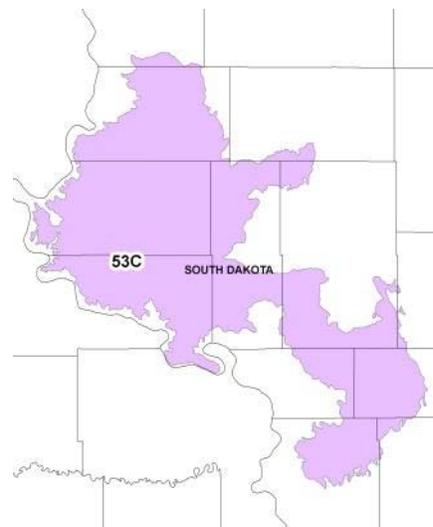
### Ecological Site Description

**Site Type:** Rangeland

**Site Name:** Sandy

**Site ID:** R053CY009SD

**Major Land Resource Area (MLRA):** 53C – Southern Dark Brown Glaciated Plains



### Physiographic Features

This site occurs on nearly level to steeply sloping uplands.

**Landform:** plain, terrace, or drainageway      **Aspect:** N/A

	<u>Minimum</u>	<u>Maximum</u>
<b>Elevation (feet):</b>	1,300	2,300
<b>Slope (percent):</b>	0	23
<b>Water Table Depth (inches):</b>	80	80
<b>Flooding:</b>		
<b>Frequency:</b>	None	None
<b>Duration:</b>	None	None
<b>Ponding:</b>		
<b>Depth (inches):</b>	None	None
<b>Frequency:</b>	None	None
<b>Duration:</b>	None	None
<b>Runoff Class:</b>	Negligible	Medium

### Climatic Features

MLRA 53C is considered to have a continental climate – cold winters and hot summers, low humidity, light rainfall, and much sunshine. Extremes in temperature may also abound. The climate is the result of this MLRA's location near the geographic center of North America. There are few natural barriers on the Northern Great Plains and air masses move freely across the plains and account for rapid changes in temperature.

Annual precipitation typically ranges from 18 to 22 inches per year. The average annual temperature is about 45°F. January is the coldest month with average temperatures ranging from about 15°F (Stephan, South Dakota (SD)), to about 16°F (Onida 4 NW, SD). July is the warmest month with temperatures averaging from about 72°F (Stephan, SD), to about 74°F (Onida 4 NW, SD). The range of normal average monthly temperatures between the coldest and warmest months is about 58°F. This large annual range attests to the continental nature of this area's climate. Hourly winds are estimated to average about 12 miles per hour (mph) annually, ranging from about 13 mph during the spring to about 11 mph 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 mph.

Growth of cool-season plants begins in early to mid-March, slowing or ceasing in late June. Warm-season plants begin growth about mid-May and continue to early or mid-September. Greenup of cool-season plants may occur in September and October when adequate soil moisture is present.

	<u>Minimum</u>	<u>Maximum</u>
<b>Frost-free period (days):</b>	125	141
<b>Freeze-free period (days):</b>	142	160
<b>Mean Annual Precipitation (inches):</b>	18	22

**Average Monthly Precipitation (inches) and Temperature (°F):**

	<b>Precip. Min.</b>	<b>Precip. Max</b>	<b>Temp. Min.</b>	<b>Temp. Max.</b>
January	0.25	0.56	3.6	26.4
February	0.37	0.57	7.8	30.9
March	1.02	1.04	19.5	43.1
April	1.68	3.01	31.0	58.7
May	2.68	3.35	42.6	70.1
June	3.17	3.41	53.3	79.1
July	2.50	3.34	58.7	88.7
August	1.73	2.06	56.8	87.6
September	1.94	2.48	47.3	77.3
October	1.35	1.67	33.7	62.3
November	0.52	0.77	20.8	42.4
December	0.21	0.34	8.5	31.2

<b>Climate Stations</b>		<b>Period</b>	
<b>Station ID</b>	<b>Location or Name</b>	<b>From</b>	<b>To</b>
SD3608	Harrold 12 SSW	1963	2008
SD6292	Onida 4 NW	1913	2008
SD7992	Stephan	1903	2008
SD9077	Wessington Springs 7 SW	1948	1998

For local climate stations that may be more representative, refer to <http://www.wcc.nrcs.usda.gov>.

### Riparian and Wetland Features

No riparian areas or wetland features are directly associated with this site.

### Representative Soil Features

The features common to all soils in this site are the loamy fine sand or fine sandy loam textured surface layers and slopes of 0 to 23 percent. The soils in this site are from well-drained to excessively drained. They formed primarily in eolian deposits or sandy alluvium. The surface layer is 8 to 17 inches thick. This site should show slight to no evidence of rills, wind scoured areas, or pedestalled plants. Water flow paths are broken, irregular in appearance, or discontinuous. The soil surface is stable and intact. Subsurface soil layers are not restrictive to water movement and root penetration.

These soils are mainly susceptible to water erosion. The hazard of water erosion increases on slopes greater than about 10 percent. Loss of 50 percent or more of the surface layer of the soils on this site can result in a shift in species composition and/or production.

Access Web Soil Survey (<http://websoilsurvey.nrcs.usda.gov/app/>) for specific local soils information.

**Parent Material Kind:** sandy eolian, loamy and/or sandy alluvium, loamy alluvium over outwash

**Parent Material Origin:**

**Surface Texture:** loam, sandy loam, fine sandy loam

**Surface Texture Modifier:** none

**Subsurface Texture Group:** fine sandy loam

**Surface Fragments ≤3" (% Cover):** 0-0

**Surface Fragments >3" (%Cover):** 0-0

**Subsurface Fragments ≤3" (% Volume):** 0-41

**Subsurface Fragments >3" (% Volume):** 0-3

	<u>Minimum</u>	<u>Maximum</u>
<b>Drainage Class:</b>	well	excessively
<b>Permeability Class:</b>	moderately slow	moderate
<b>Depth (inches):</b>	80	80
<b>Electrical Conductivity (mmhos/cm)*:</b>	0	2
<b>Sodium Absorption Ratio*:</b>	0	0
<b>Soil Reaction (1:1 Water)*:</b>	6.1	8.4
<b>Soil Reaction (0.1M CaCl<sub>2</sub>)*:</b>	NA	NA
<b>Available Water Capacity (inches)*:</b>	4	6
<b>Calcium Carbonate Equivalent (percent)*:</b>	0	30

\*These attributes represent from 0-40 inches or to the first restrictive layer.

## Plant Communities and Transitional Pathways

### Ecological Dynamics of the Site

This site developed under Northern Great Plains climatic conditions, light to severe grazing by bison and other large herbivores, sporadic natural or man-caused wildfire (often of light intensities), and other biotic and abiotic factors that typically influence soil/site development. Changes will occur in the plant communities due to short-term weather variations, impacts of native and/or exotic plant and animal species, and management actions. While the following plant community descriptions describe more typical transitions that will occur, severe disturbances, such as periods of well below average precipitation, can cause significant shifts in plant communities and/or species composition.

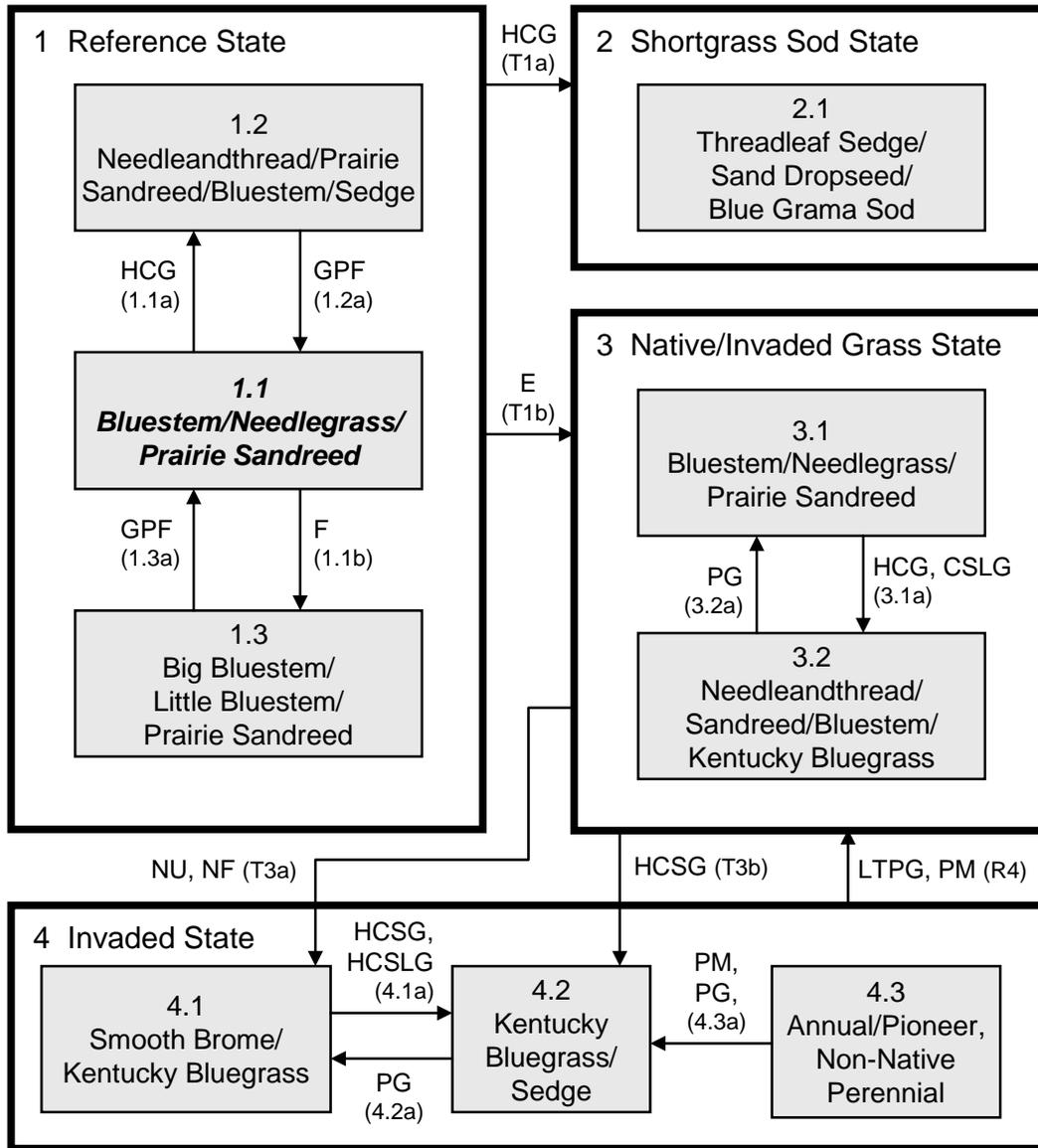
Heavy continuous grazing (season-long grazing during the typical growing season of April through October and/or repeated seasonal grazing during the same time of year each year) without adequate recovery periods following grazing events causes departure from the 3.1

Bluestem/Needlegrass/Prairie Sandreed Plant Community Phase which most typically occurs in this ecological site (ES) in MLRA 53 C. Sedge and blue grama will increase and eventually develop into a sod. Western wheatgrass will increase initially and then begin to decrease. Needleandthread, porcupine grass, sideoats grama, big bluestem, and little bluestem will decrease in frequency and production. Extended periods of nonuse and/or lack of fire will result in excessive litter and a plant community dominated by cool-season grasses such as Kentucky bluegrass, smooth brome, and cheatgrass. Today, the 3.1 Bluestem/Needlegrass/Prairie Sandreed Plant Community Phase most resembles the 1.1 Reference Plant Community Phase.

Interpretations are primarily based on the 1.1 Bluestem/Needlegrass/Prairie Sandreed Plant Community Phase. It 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 used. Plant community phases, states, transitional pathways, and thresholds have been determined through similar studies and experience. Due to a general invasion of exotic species (such as Kentucky bluegrass and smooth brome) across the MLRA within this site, returning to the 1.1 Bluestem/Needlegrass/Prairie Sandreed Plant Community Phase.

The following is a diagram that illustrates the common plant community phases that can occur on the site and the transition pathways between communities. These are the most common plant community phases based on current knowledge and experience, and changes may be made as more data is collected. Narratives following the diagram contain more detail pertaining to the ecological processes.

### Plant Communities and Transitional Pathways



Refer to narrative for details on pathways: **C** – Cropped, abandoned; **CSLG** – Continuous season-long grazing; **E** – Encroachment of introduced species; **F** – Fire; **GPF** – Grazing, precipitation, and/or fire returning to more normal disturbance regime levels and frequencies; **HCG** – Heavy continuous grazing; **HCSG** – Heavy continuous seasonal grazing; **HCSLG** – Heavy continuous season-long grazing; **LTPG** – Long-term prescribed grazing; **NU**, **NF** – Non-use, no fire; **PG** – Prescribed grazing; **PM** – Pest management (herbicide); **S** – Seeding.

**Any Plant Community**

Plant Community Composition and Group Annual Production

COMMON/GROUP NAME	SCIENTIFIC NAME	SYMBOL	1.1 Bluestem/Needlegrass/ Prairie Sandreed		
			Group	lbs./acre	% Comp
<b>GRASSES &amp; GRASS-LIKES</b>				2380 - 2660	85 - 95
<b>TALL WARM-SEASON GRASSES</b>			1	420 - 840	15 - 30
big bluestem	Andropogon gerardii	ANGE	1	280 - 560	10 - 20
prairie sandreed	Calamovilfa longifolia	CALO	1	140 - 560	5 - 20
switchgrass	Panicum virgatum	PAVI2	1	28 - 140	1 - 5
Indiangrass	Sorghastrum nutans	SONU2	1	0 - 84	0 - 3
<b>COOL-SEASON BUNCHGRASSES</b>			2	420 - 700	15 - 25
needleandthread	Hesperostipa comata ssp. comata	HECOC8	2	280 - 560	10 - 20
porcupine grass	Hesperostipa spartea	HESP11	2	56 - 280	2 - 10
green needlegrass	Nassella viridula	NAVI4	2	0 - 140	0 - 5
Canada wildrye	Elymus canadensis	ELCA4	2	0 - 84	0 - 3
<b>MID WARM-SEASON GRASSES</b>			3	140 - 420	5 - 15
little bluestem	Schizachyrium scoparium	SCSC	3	140 - 280	5 - 10
sideoats grama	Bouteloua curtipendula	BOCU	3	56 - 280	2 - 10
<b>WHEATGRASS</b>			4	140 - 280	5 - 10
western wheatgrass	Pascopyrum smithii	PASM	4	140 - 280	5 - 10
slender wheatgrass	Elymus trachycaulus	ELTR7	4	0 - 140	0 - 5
<b>SHORT WARM-SEASON GRASSES</b>			5	84 - 224	3 - 8
blue grama	Bouteloua gracilis	BOGR2	5	56 - 196	2 - 7
sand dropseed	Sporobolus cryptandrus	SPCR	5	28 - 84	1 - 3
<b>OTHER NATIVE GRASSES</b>			6	56 - 196	2 - 7
prairie junegrass	Koeleria macrantha	KOMA	6	28 - 84	1 - 3
sand lovegrass	Eragrostis trichodes	ERTR3	6	0 - 56	0 - 2
sand paspalum	Paspalum setaceum	PASE5	6	0 - 56	0 - 2
Scribner panicum	Dichanthelium oligosanthes var. scribnerianum	DIOLS	6	28 - 56	1 - 2
Wilcox panicum	Dichanthelium wilcoxianum	DIWI5	6	0 - 56	0 - 2
other grasses		2GL	6	0 - 140	0 - 5
<b>GRASS-LIKES</b>			7	140 - 280	5 - 10
threadleaf sedge	Carex filifolia	CAFI	7	56 - 224	2 - 8
other grass-likes		2GL	7	28 - 140	1 - 5
<b>FORBS</b>			9	140 - 280	5 - 10
American licorice	Glycyrrhiza lepidota	GLLE3	9	0 - 28	0 - 1
American vetch	Vicia americana	VIAM	9	28 - 56	1 - 2
cudweed sagewort	Artemisia ludoviciana	ARLU	9	28 - 56	1 - 2
curlycup gumweed	Grindelia squarrosa	GRSQ	9	0 - 28	0 - 1
dotted gayfeather	Liatris punctata	LIPU	9	28 - 56	1 - 2
false boneset	Brickellia eupatorioides	BREU	9	0 - 56	0 - 2
goldenrod	Solidago spp.	SOLID	9	28 - 56	1 - 2
hairy goldaster	Heterotheca villosa	HEVI4	9	0 - 56	0 - 2
heath aster	Symphyotrichum ericoides	SYER	9	28 - 56	1 - 2
hoary puccoon	Lithospermum canescens	LICA12	9	28 - 56	1 - 2
penstemon	Penstemon spp.	PENST	9	28 - 56	1 - 2
prairie coneflower	Ratibida columnifera	RACO3	9	28 - 56	1 - 2
prairie groundsel	Packera plattensis	PAPL12	9	0 - 28	0 - 1
purple coneflower	Echinacea angustifolia	ECAN2	9	0 - 28	0 - 1
purple prairie clover	Dalea purpurea	DAPU5	9	28 - 56	1 - 2
rush skeletonweed	Lygodesmia juncea	LYJU	9	0 - 28	0 - 1
scarlet gaura	Gaura coccinea	GACO5	9	28 - 56	1 - 2
scurfpea	Psoraleidum spp.	PSORA2	9	28 - 56	1 - 2
stiff sunflower	Helianthus pauciflorus	HEPA19	9	28 - 84	1 - 3
western ragweed	Ambrosia psilostachya	AMPS	9	0 - 28	0 - 1
western yarrow	Achillea millefolium var. occidentalis	ACMIO	9	0 - 28	0 - 1
native forbs		2FN	9	28 - 84	1 - 3
<b>SHRUBS</b>			10	56 - 140	2 - 5
fringed sagewort	Artemisia frigida	ARFR4	10	0 - 28	0 - 1
leadplant	Amorpha canescens	AMCA6	10	28 - 112	1 - 4
rose	Rosa spp.	ROSA5	10	28 - 56	1 - 2
snowberry	Symphoricarpos spp.	SYMPH	10	0 - 56	0 - 2
other shrubs		2SHRUB	10	0 - 56	0 - 2

Annual Production lbs./acre	LOW	RV	HIGH
<b>GRASSES &amp; GRASS-LIKES</b>	1820 -	2492	- 3025
<b>FORBS</b>	125 -	210	- 320
<b>SHRUBS</b>	55 -	98	- 155
<b>TOTAL</b>	2000 -	2800	- 3500

This list of plants and their relative proportions are based on near normal years. Fluctuations in species composition and relative production may change from year to year dependent upon precipitation or other climatic factors. RV = Representative value.

Plant Community Composition and Group Annual Production

COMMON/GROUP NAME	SYMBOL	1.1 Bluestem/Needlegrass/ Prairie Sandreed			3.2 Needleandthread/Sandreed/ Bluestem/Kentucky Bluegrass			4.1 Smooth Bromegrass/ Kentucky Bluegrass			4.2 Kentucky Bluegrass/ Sedge		
		Grp	lbs./acre	% Comp	Grp	lbs./acre	% Comp	Grp	lbs./acre	% Comp	Grp	lbs./acre	% Comp
<b>GRASSES &amp; GRASS-LIKES</b>			2380 - 2660	85 - 95		1760 - 1980	80 - 90		2465 - 2610	85 - 90		1530 - 1710	85 - 95
<b>TALL WARM-SEASON GRASSES</b>		1	420 - 840	15 - 30	1	110 - 440	5 - 20	1			1		
big bluestem	ANGE	1	280 - 560	10 - 20	1	0 - 220	0 - 10						
prairie sandreed	CALO	1	140 - 560	5 - 20	1	44 - 330	2 - 15						
switchgrass	PAVI2	1	28 - 140	1 - 5	1	0 - 44	0 - 2						
Indiangrass	SONU2	1	0 - 84	0 - 3									
<b>COOL-SEASON BUNCHGRASSES</b>		2	420 - 700	15 - 25	2	220 - 550	10 - 25	2	0 - 290	0 - 10	2	0 - 90	0 - 5
needleandthread	HECOC8	2	280 - 560	10 - 20	2	220 - 550	10 - 25	2	0 - 290	0 - 10	2	0 - 90	0 - 5
porcupine grass	HESPR11	2	56 - 280	2 - 10	2	0 - 110	0 - 5						
green needlegrass	NAVI4	2	0 - 140	0 - 5	2	0 - 44	0 - 2	2	0 - 87	0 - 3	2	0 - 18	0 - 1
Canada wildrye	ELCA4	2	0 - 84	0 - 3									
<b>MID WARM-SEASON GRASSES</b>		3	140 - 420	5 - 15	3	22 - 220	1 - 10	3	0 - 145	0 - 5	3	0 - 54	0 - 3
little bluestem	SCSC	3	140 - 280	5 - 10	3	0 - 220	0 - 10	3	0 - 145	0 - 5	3	0 - 54	0 - 3
sideoats grama	BOCU	3	56 - 280	2 - 10	3	22 - 110	1 - 5	3	0 - 145	0 - 5			
<b>WHEATGRASS</b>		4	140 - 280	5 - 10	4	44 - 220	2 - 10	4	0 - 290	0 - 10	4	0 - 90	0 - 5
western wheatgrass	PASM	4	140 - 280	5 - 10	4	44 - 220	2 - 10	4	0 - 290	0 - 10	4	0 - 90	0 - 5
slender wheatgrass	ELTR7	4	0 - 140	0 - 5									
<b>SHORT WARM-SEASON GRASSES</b>		5	84 - 224	3 - 8	5	110 - 286	5 - 13	5	0 - 145	0 - 5	5	36 - 360	2 - 20
blue grama	BOGR2	5	56 - 196	2 - 7	5	66 - 264	3 - 12	5	0 - 145	0 - 5	5	36 - 360	2 - 20
sand dropseed	SPCR	5	28 - 84	1 - 3	5	22 - 110	1 - 5	5	0 - 87	0 - 3	5	0 - 90	0 - 5
<b>OTHER NATIVE GRASSES</b>		6	56 - 196	2 - 7	6	22 - 110	1 - 5	6	0 - 145	0 - 5	6	0 - 72	0 - 4
prairie junegrass	KOMA	6	28 - 84	1 - 3	6	22 - 44	1 - 2	6	0 - 87	0 - 3	6	0 - 18	0 - 1
sand lovegrass	ERTR3	6	0 - 56	0 - 2	6			6			6		
sand paspalum	PASE5	6	0 - 56	0 - 2	6			6			6		
Scribner panicum	DIOLS	6	28 - 56	1 - 2	6	0 - 44	0 - 2	6	0 - 58	0 - 2	6	0 - 36	0 - 2
Wilcox panicum	DIWI5	6	0 - 56	0 - 2	6	0 - 44	0 - 2	6	0 - 29	0 - 1	6	0 - 18	0 - 1
other grasses	ZGRAM	6	0 - 140	0 - 5	6	0 - 110	0 - 5	6	0 - 116	0 - 4	6	0 - 54	0 - 3
<b>GRASS-LIKES</b>		7	140 - 280	5 - 10	7	110 - 264	5 - 12	7	29 - 174	1 - 6	7	90 - 630	5 - 35
threadleaf sedge	CAFI	7	56 - 224	2 - 8	7	66 - 264	3 - 12	7	29 - 174	1 - 6	7	90 - 630	5 - 35
other grass-like	ZGL	7	28 - 140	1 - 5	7	22 - 110	1 - 5	7	0 - 87	0 - 3	7	0 - 54	0 - 3
<b>NON-NATIVE GRASSES</b>		8			8	110 - 330	5 - 15	8	725 - 2030	25 - 70	8	180 - 810	10 - 45
annual bromegrass	BROMU				8	22 - 110	1 - 5	8	29 - 290	1 - 10	8	0 - 126	0 - 7
Kentucky bluegrass	POPR				8	110 - 330	5 - 15	8	145 - 870	5 - 30	8	180 - 810	10 - 45
quackgrass	ELRE4				8	0 - 110	0 - 5	8	0 - 435	0 - 15	8	0 - 180	0 - 10
smooth bromegrass	BRIN2				8	0 - 110	0 - 5	8	290 - 1885	10 - 65	8	0 - 126	0 - 7
cheatgrass	BRTE				8	0 - 44	0 - 2	8	0 - 58	0 - 2	8	0 - 90	0 - 5
<b>FORBS</b>		9	140 - 280	5 - 10	9	110 - 330	5 - 15	9	145 - 290	5 - 10	9	36 - 216	2 - 12
American licorice	GLLE3	9	0 - 28	0 - 1	9	0 - 22	0 - 1						
American vetch	VIAM	9	28 - 56	1 - 2	9	0 - 22	0 - 1	9	0 - 29	0 - 1			
catclaw sensitive brier	MINU6	9	0 - 28	0 - 1									
cutweed sagewort	ARLU	9	28 - 56	1 - 2	9	22 - 88	1 - 4	9	29 - 87	1 - 3	9	0 - 72	0 - 4
curlycup gumweed	GRSQ	9	0 - 28	0 - 1	9	0 - 44	0 - 2	9	0 - 58	0 - 2	9	18 - 72	1 - 4
dotted gayfeather	LIPU	9	28 - 56	1 - 2	9	0 - 22	0 - 1						
false bonaset	BREU	9	0 - 56	0 - 2	9	0 - 22	0 - 1						
goldenrod	SOLID	9	28 - 56	1 - 2	9	22 - 88	1 - 4	9	29 - 87	1 - 3	9	0 - 54	0 - 3
hairy goldaster	HEVI4	9	0 - 56	0 - 2	9	0 - 44	0 - 2	9	0 - 29	0 - 1	9	0 - 72	0 - 4
heath aster	SYER	9	28 - 56	1 - 2	9	22 - 66	1 - 3	9	29 - 58	1 - 2	9	0 - 36	0 - 2
hoary puccoon	LICA12	9	28 - 56	1 - 2	9	0 - 22	0 - 1						
penstemon	PENST	9	28 - 56	1 - 2	9	0 - 22	0 - 1						
prairie coneflower	RACO3	9	28 - 56	1 - 2	9	22 - 44	1 - 2	9	0 - 29	0 - 1			
prairie groundsel	PAPL12	9	0 - 28	0 - 1									
purple coneflower	ECAN2	9	0 - 28	0 - 1									
purple prairie clover	DAPU5	9	28 - 56	1 - 2	9	0 - 22	0 - 1	9	0 - 29	0 - 1			
rush skeletonweed	LYJU	9	0 - 28	0 - 1	9	0 - 22	0 - 1	9	0 - 29	0 - 1	9	0 - 18	0 - 1
scarlet gaura	GACO5	9	28 - 56	1 - 2	9	0 - 22	0 - 1						
scurfspea	PSORA2	9	28 - 56	1 - 2	9	22 - 88	1 - 4	9	29 - 87	1 - 3	9	0 - 36	0 - 2
stiff sunflower	HEPA19	9	28 - 84	1 - 3	9	0 - 22	0 - 1						
western ragweed	AMPS	9	0 - 28	0 - 1	9	22 - 66	1 - 3	9	29 - 116	1 - 4	9	18 - 72	1 - 4
western yarrow	ACMIO	9	0 - 28	0 - 1	9	0 - 44	0 - 2	9	0 - 58	0 - 2	9	18 - 90	1 - 5
native forbs	ZFN	9	28 - 84	1 - 3	9	0 - 44	0 - 2	9	0 - 29	0 - 1	9	18 - 54	1 - 3
introduced forbs	ZFI				9	0 - 110	0 - 5	9	29 - 145	1 - 5	9	18 - 90	1 - 5
<b>SHRUBS</b>		10	56 - 140	2 - 5	10	22 - 110	1 - 5	10	29 - 116	1 - 4	10	18 - 72	1 - 4
fringed sagewort	ARFR4	10	0 - 28	0 - 1	10	0 - 44	0 - 2	10	0 - 58	0 - 2	10	18 - 72	1 - 4
leadplant	AMCA6	10	28 - 112	1 - 4	10	0 - 22	0 - 1						
rose	ROSA5	10	28 - 56	1 - 2	10	22 - 44	1 - 2	10	0 - 58	0 - 2	10	0 - 18	0 - 1
snowberry	SYMPH	10	0 - 56	0 - 2	10	0 - 44	0 - 2	10	0 - 116	0 - 4	10	0 - 18	0 - 1
other shrubs	ZSHRUB	10	0 - 56	0 - 2	10	0 - 44	0 - 2	10	0 - 29	0 - 1	10	0 - 18	0 - 1
<b>Annual Production lbs./acre</b>			LOW RV HIGH		LOW RV HIGH		LOW RV HIGH		LOW RV HIGH		LOW RV HIGH		LOW RV HIGH
<b>GRASSES &amp; GRASS-LIKES</b>			1820 - 2492 - 3025		1280 - 1914 - 2295		1645 - 2610 - 3040		1050 - 1629 - 2380				
<b>FORBS</b>			125 - 210 - 320		100 - 220 - 385		130 - 218 - 335		35 - 126 - 245				
<b>SHRUBS</b>			55 - 98 - 155		20 - 66 - 120		25 - 73 - 125		15 - 45 - 75				
<b>TOTAL</b>			2000 - 2800 - 3500		1400 - 2200 - 2800		1800 - 2900 - 3500		1100 - 1800 - 2700				

This list of plants and their relative proportions are based on near normal years. Fluctuations in species composition and relative production may change from year to year dependent upon precipitation or other climatic factors. RV = Representative value. Refer to PLANTS database for scientific names and codes: <http://plants.usda.gov>

## Plant Community and Vegetation State Narratives

### Reference State (State 1)

This state represents the natural range of variability that dominated the dynamics of this ES. This state was codominated by cool- and warm-season grasses. In pre-European times, the primary disturbance mechanisms for this site in the reference condition included periods of below and/or above average precipitation, periodic fire, and herbivory by insects and large ungulates. Timing of fires and herbivory coupled with weather events dictated the dynamics that occurred within the natural range of variability. Cool-season and taller warm-season grasses would have declined and a corresponding increase in short, warm-season grasses would have occurred. Today, a similar state can be found on areas that are properly managed with grazing and/or prescribed burning, and sometimes on areas receiving occasional short periods of rest. These sites are differentiated by the presence of exotic species such as Kentucky bluegrass and smooth brome. On most Sandy ESs within this MLRA, these species have invaded and are now present. It is likely that attaining the reference state as it is described here (without the presence of exotic herbaceous species) is not possible.

### 1.1 Bluestem/Needlegrass/Prairie Sandreed Plant Community Phase

Interpretations are based primarily on the 1.1 Bluestem/Needlegrass/Prairie Sandreed Plant Community Phase (this is also considered to be climax). The potential vegetation was about 85 percent grasses or grass-like plants, 10 percent forbs, and 5 percent shrubs. The community was dominated by warm-season grasses with cool-season grasses subdominant. The major grasses included big bluestem, prairie sandreed, little bluestem, needleandthread, and porcupine grass. Other grass or grass-like species included sideoats grama, western wheatgrass, blue grama, threadleaf sedge, Indiangrass, switchgrass, and slender wheatgrass. This plant community was resilient and well adapted to the Northern Great Plains climatic conditions. The diversity in plant species allowed for high drought tolerance. This was a sustainable plant community in regards to site/soil stability, watershed function, and biologic integrity.

The following growth curve is an estimate of the monthly percentages of total annual growth of the dominant species expected during an average year:

Growth curve number: SD5304

Growth curve name: Southern Dark Brown Glaciated Plains, warm-season dominant, cool-season subdominant.

Growth curve description: Warm-season dominant, cool-season subdominant.

JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
0	0	3	7	17	25	25	15	7	1	0	0

Transitions or pathways leading to other plant communities were as follows:

- 1.1a – Heavy Continuous Grazing at the same time of year, each year, without adequate recovery periods or chronic heavy grazing will shift this community to the 1.2 Needleandthread/Prairie Sandreed/Bluestem/Sedge Plant Community Phase.
- 1.1b – Fire returning at shorter intervals than naturally occur or human caused will shift this plant community to the 1.3 Big Bluestem/Little Bluestem/Prairie Sandreed Plant Community Phase. This may have been accompanied with periodic light to moderate grazing with possible periodic rest.

### 1.2 Needleandthread/Prairie Sandreed/Bluestem/Sedge Plant Community Phase

This plant community evolved under heavy continuous grazing or from over utilization during extended drought periods. The potential plant community was made up of approximately 80 percent

grasses and grass-like species, 15 percent forbs, and 5 percent shrubs. Dominant grasses included needleandthread, prairie sandreed, little bluestem, western wheatgrass, threadleaf sedge, and blue grama. Grasses of secondary importance included sideoats grama, porcupine grass, and sand dropseed. Forbs commonly found in this plant community included cudweed sagewort, prairie coneflower, and western yarrow. This plant community had similar plant composition to the 3.2 Needleandthread/Sandreed/Bluestem/Kentucky Bluegrass Plant Community Phase (refer to the plant composition tables). The main difference is that this plant community phase did not have the presence of non-native invasive species such as Kentucky bluegrass and smooth brome.

When compared to the 1.1 Bluestem/Needlegrass/Prairie Sandreed Plant Community Phase, needleandthread, threadleaf sedge, and blue grama increased. Big bluestem and porcupine grass decreased, and production of mid and tall warm-season grasses was also reduced. This plant community was moderately resistant to change. The herbaceous species present were well adapted to grazing; however, species composition could be altered through long-term overgrazing. If the herbaceous component was intact, it tended to be resilient if the disturbance was not long-term.

The following growth curve is an estimate of the monthly percentages of total annual growth of the dominant species expected during an average year:

Growth curve number: SD5302

Growth curve name: Southern Dark Brown Glaciated Plains, cool-season dominant, warm-season subdominant.

Growth curve description: Cool-season dominant, warm-season subdominant.

JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
0	0	3	10	23	34	15	6	5	4	0	0

Transitions or pathways leading to other plant communities are as follows:

- 1.2a – Grazing, Precipitation, and Fire returned to normal disturbance regime levels and frequencies, along with precipitation and periodic light to moderate grazing with possible periodic rest will shift this community to the 1.1 Bluestem/Needlegrass/Prairie Sandreed Plant Community Phase.

### 1.3 Big Bluestem/Little Bluestem/Prairie Sandreed Plant Community Phase

This plant community developed with fire, usually returning in shorter-than-natural intervals. The potential plant community was made up of approximately 85 percent grasses and grass-like species, 10 percent forbs, and 5 percent shrubs. Dominant grasses included big bluestem, little bluestem, prairie sandreed, and switchgrass. Grasses of secondary importance included sideoats grama, blue grama, and sand dropseed. Forbs commonly found in this plant community included scurf pea, stiff sunflower, and hairy goldaster.

When compared to the 1.1 Bluestem/Needlegrass/Prairie Sandreed Plant Community Phase, big bluestem, little bluestem, and prairie sandreed have slightly increased and needlegrasses have decreased. This plant community was moderately resistant to change. The herbaceous species present were well adapted to grazing; however, species composition could be altered through fire return intervals returning to normal and moderate grazing use. If the herbaceous component was intact, it tended to be resilient if the disturbance was not long-term.

The following growth curve is an estimate of the monthly percentages of total annual growth of the dominant species expected during an average year:

Growth curve number: SD5305

Growth curve name: Southern Dark Brown Glaciated Plains, warm-season dominant.

Growth curve description: Warm-season dominant.

JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
0	0	2	5	15	25	30	15	7	1	0	0

Transitions or pathways leading to other plant communities are as follows:

- 1.3a – Grazing, Precipitation, and Fire returned to normal disturbance regime levels and frequencies, along with precipitation and periodic light to moderate grazing with possible periodic rest will shift this community to the 1.1 Bluestem/Needlegrass/Prairie Sandreed Plant Community Phase.

### Transitions from Reference State (State 1) to Shortgrass Sod State (State 2)

- T1a – Heavy Continuous Grazing at the same time of year, each year, without adequate recovery periods or chronic heavy grazing will shift this community to the 2.0 Shortgrass Sod State.

### Transitions from Reference State (State 1) to Native/Invaded State (State 3)

- T1b – Encroachment of nonnative species such as Kentucky bluegrass and smooth brome, in combination with the disruption of natural regimes (typically fire suppression following settlement), will shift this plant community to the 3.0 Native/Invaded State.

### Shortgrass Sod State (State 2)

#### 2.1 Threadleaf Sedge/Sand Dropseed/Blue Grama Sod Plant Community Phase

This plant community evolved under heavy continuous season grazing or from over utilization during extended drought periods. The potential plant community was made up of approximately 85 percent grasses and grass-like species, 10 percent forbs, and 5 percent shrubs. Dominant grasses typically included threadleaf sedge and blue grama and sand dropseed increases noticeably on the site. Grasses of secondary importance included western wheatgrass and needleandthread. Forbs commonly found in this plant community included cudweed sagewort, green sagewort, and western yarrow. This vegetation state was very resistant to change. The herbaceous species present were well adapted to grazing. This plant community was less productive than other phases. The thick sod prevented other species from getting established due to decreased infiltration and increased runoff.

The following growth curve is an estimate of the monthly percentages of total annual growth of the dominant species expected during an average year:

Growth curve number: SD5302

Growth curve name: Southern Dark Brown Glaciated Plains, cool-season dominant, warm-season subdominant.

Growth curve description: Cool-season dominant, warm-season subdominant.

JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
0	0	3	10	23	34	15	6	5	4	0	0

### Native/Invaded State (State 3)

This state represents the more common range of variability that exists with higher levels of grazing management but in the absence of periodic fire due to fire suppression and the presence of exotic herbaceous species (especially smooth brome and Kentucky bluegrass).

This state is dominated by cool- and warm-season grasses. It can be found on areas that are properly managed with grazing and/or prescribed burning and sometimes on areas receiving occasional short periods of rest. Taller cool-season species can decline and a corresponding increase in short statured grass will occur.

### 3.1 Bluestem/Needlegrass/Prairie Sandreed Plant Community Phase

This plant community phase is similar to the 1.1 Bluestem/Needlegrass/Prairie Sandreed Plant Community Phase, but it also contains minor amounts of nonnative invasive grass species such as Kentucky bluegrass and smooth brome (up to about 15 percent by air-dry weight). The potential vegetation is about 85 percent grasses or grass-like plants, 10 percent forbs, and 5 percent shrubs. The community is dominated by warm-season grasses with cool-season grasses subdominant. The major grasses include big bluestem, prairie sandreed, little bluestem, needleandthread, and porcupine grass. Other grass or grass-like species include sideoats grama, western wheatgrass, blue grama, threadleaf sedge, Indiangrass, switchgrass, and slender wheatgrass. This plant community is resilient and well adapted to the Northern Great Plains climatic conditions. The diversity in plant species allows for high drought tolerance. This is a sustainable plant community in regards to site/soil stability, watershed function, and biologic integrity.

The following growth curve is an estimate of the monthly percentages of total annual growth of the dominant species expected during an average year:

Growth curve number: SD5302

Growth curve name: Southern Dark Brown Glaciated Plains, cool-season dominant, warm-season subdominant.

Growth curve description: Cool-season dominant, warm-season subdominant.

JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
0	0	3	10	23	34	15	6	5	4	0	0

Transitions or pathways leading to other plant communities are as follows:

- 3.1a – Heavy Continuous Grazing at the same time of year, each year, without adequate recovery periods or chronic heavy grazing and/or Continuous Season-Long Grazing utilizing available forages through the majority of the growing season in the absence of adequate rest periods and livestock grazing returning year after year will shift this plant community to the 3.2 Needleandthread/Sandreed/Bluestem/Kentucky Bluegrass Plant Community Phase.

### 3.2 Needleandthread/Sandreed/Bluestem/Kentucky Bluegrass Plant Community Phase

This plant community is a result of heavy continuous grazing, continuous season-long grazing or from over utilization during extended drought periods. The potential plant community is made up of approximately 80 percent grasses and grass-like species, 15 percent forbs, and 5 percent shrubs. Dominant grasses include needleandthread, prairie sandreed, little bluestem, western wheatgrass, threadleaf sedge, and blue grama. Grasses of secondary importance include sideoats grama, porcupine grass, and sand dropseed. Forbs commonly found in this plant community include cudweed sagewort, prairie coneflower, and western yarrow.

When compared to the 1.1 Bluestem/Needlegrass/Prairie Sandreed Plant Community Phase, threadleaf sedge, needleandthread, and blue grama have increased. Big bluestem, little bluestem, and porcupine grass have decreased, and production of mid- and tall warm-season grasses has also been reduced. This plant community is moderately resistant to change. The herbaceous species present are well adapted to grazing; however, species composition can be altered through long-term overgrazing. If the herbaceous component is intact, it tends to be resilient if the disturbance is not long-term.

The following growth curve is an estimate of the monthly percentages of total annual growth of the dominant species expected during an average year:

Growth curve number: SD5302

Growth curve name: Southern Dark Brown Glaciated Plains, cool-season dominant, warm-season subdominant.

Growth curve description: Cool-season dominant, warm-season subdominant.

JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
0	0	3	10	23	34	15	6	5	4	0	0

Transitions or pathways leading to other plant communities are as follows:

- 3.2a – Prescribed Grazing that includes alternating season of utilization while providing adequate rest recovery periods of periodic light to moderate grazing will shift this plant community to the 3.1 Bluestem/Needlegrass/Prairie Sandreed Plant Community Phase.
- T3a – Non-use and No Fire for extended periods of time (typically for 10 or more years) can lead this state over a threshold to the 4.1 Smooth Brome/Kentucky Bluegrass Plant Community Phase within the 4.0 Invaded State.

#### Transitions from Native/ Invaded State (State 3) to Invaded State (State 4)

- T3b – Heavy Continuous Seasonal Grazing with stocking levels well above carrying capacity for extended portions of the growing season, and at the same time of year, each year, will shift this plant community to the 4.2 Kentucky Bluegrass/Sedge Plant Community Phase in the 4.0 Invaded State.

#### Invaded State (State 4)

This state is a result of encroachment mainly by invasive introduced cool-season grasses. The ecological processes are not functioning especially the biotic processes and the hydrologic functions. The introduced cool-season grasses cause reduced infiltration and increased runoff. Preliminary studies would tend to indicate this threshold may exist when Kentucky bluegrass exceeds 30 percent of the plant community and native grasses represent less than 40 percent of the plant community composition. The opportunity for high intensity spring burns is severely reduced by early greenup and increased moisture and humidity at the soil surface and grazing pressure cannot cause a reduction in sodgrass dominance. Production is limited to the sod forming species. Infiltration continues to decrease and runoff increases, energy capture into the system is restricted to early season low producing species. Nutrient cycling is limited by root depth of the dominate species.

#### 4.1 Smooth Brome/Kentucky Bluegrass Plant Community Phase

This plant community phase is a result of extended periods of nonuse and no fire. It is characterized by a dominance of smooth brome and Kentucky bluegrass. The dominance is at times so complete that other species are difficult to find on the site. A thick duff layer also accumulates at or above the soil surface. Nutrient cycling is greatly reduced and native plants have great difficulty becoming established. When dominated by smooth brome, infiltration is moderately reduced and runoff is moderate. Production can be equal to or higher than the interpretive plant community. However, when dominated by Kentucky bluegrass, infiltration is greatly reduced and runoff is high. Production in this case will likely be significantly less. In either case, the period that palatability is high is relatively short, as these cool-season species mature rapidly. Energy capture is also reduced.

The following growth curve is an estimate of the monthly percentages of total annual growth of the dominant species expected during an average year:

Growth curve number: SD5301

Growth curve name: Southern Dark Brown Glaciated Plains, cool-season dominant.  
 Growth curve description: Cool-season dominant.

JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
0	0	4	12	25	36	10	5	4	4	0	0

Transitions or pathways leading to other plant communities are as follows:

- 4.1a – Heavy Continuous Seasonal Grazing with stocking levels well above carrying capacity for extended portions of the growing season, and at the same time of year, or Heavy Continuous Season-Long Grazing with stocking levels well above carrying capacity utilizing available forage through the majority of the growing season in the absence of adequate rest periods, grazing at the same period each year will shift this plant community to the 4.2 Kentucky Bluegrass/Sedge Plant Community Phase.

#### 4.2 Kentucky Bluegrass/Sedge Plant Community Phase

This plant community phase is a result of heavy continuous seasonal grazing or heavy, continuous season-long grazing. It is characterized by a dominance of Kentucky bluegrass, sedge, and blue grama. The dominance is at times so complete that other species are difficult to find on the site. A relatively thick duff layer can sometimes accumulate at or above the soil surface. Nutrient cycling is greatly reduced, and native plants have great difficulty becoming established. Infiltration is greatly reduced and runoff is high. Production will be significantly reduced when compared to the interpretive plant community. The period that palatability is high is relatively short as Kentucky bluegrass matures rapidly. Energy capture is also reduced. Biological activity in the soil is likely reduced significantly in this phase.

The following growth curve is an estimate of the monthly percentages of total annual growth of the dominant species expected during an average year:

Growth curve number: SD5301

Growth curve name: Southern Dark Brown Glaciated Plains, cool-season dominant.

Growth curve description: Cool-season dominant.

JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
0	0	4	12	25	36	10	5	4	4	0	0

Transitions or pathways leading to other plant communities are as follows:

- 4.2a – Prescribed Grazing that includes alternating season of utilization while providing adequate rest recovery periods of periodic light to moderate grazing will shift this plant community to the 4.1 Smooth Brome/Kentucky Bluegrass Plant Community Phase.

#### 4.3 Annual/Pioneer/Non-Native

This plant community developed under continuous heavy grazing or other excessive disturbances (e.g., heavy use areas, defoliation by rodents, etc.). The potential plant community is made up of approximately 40 to 80 percent grasses and grass-like species, 20 to 60 percent forbs, and 0 to 5 percent shrubs. The species present in this phase are highly variable, but often include non-native invasive and/or early seral species. Plant diversity is low (plant richness may be high but areas are often dominated by a few species). The ecological processes are difficult to restore because of the loss of plant diversity and overall soil disturbance. Soil erosion is potentially very high because of the bare ground and shallow rooted herbaceous plant community. Water runoff will increase and infiltration will decrease due to animal related soil compaction and loss of root mass due to low plant diversity and vigor. This plant community will require significant economic inputs and time to move towards another plant community. This movement is highly variable in its succession. This is due to

the loss of diversity (including the loss of the seed bank), within the existing plant community, and the plant communities on adjacent sites.

No growth curve has been assigned to this plant community phase.

Transitions or pathways leading to other plant communities are as follows:

- 4.3a – Pest Management using chemical or mechanical treatment to control target species and/or Prescribed Grazing that includes alternating season of utilization while providing adequate rest recovery periods of periodic light to moderate grazing will shift this plant community to the 4.2 Kentucky Bluegrass/Sedge Plant Community Phase.

### **Restoration Pathway from Invaded State (State 4) to Native/Invaded State (State 3)**

- R4 – Long Term Prescribed Grazing with moderate stocking levels coupled with adequate recovery periods, or grazing systems such as high-density, low-frequency, etc., intended to treat specific species, or periodic light to moderate stocking levels including possible rest periods will shift this community to the 3.0 Native/Invaded Grass State Pest Management may also be needed to suppress invasive grasses. Success depends on whether native reproductive propagates remain intact onsite and may take a long period of time (10 years or more). Recovery may not be attainable.

## **Ecological Site Interpretations**

### **Animal Community – Wildlife Interpretations**

-- Under Development --

**Bluestem/Needlegrass/Prairie Sandreed Plant Community Phase (1.1):**

**Needleandthread/Prairie Sandreed/Bluestem/Sedge Plant Community Phase (1.2):**

**Big Bluestem/Little Bluestem/Prairie Sandreed Plant Community Phase (1.3):**

**Threadleaf Sedge/Sand Dropseed/Blue Grama Sod Plant Community Phase (2.1):**

**Bluestem/Needlegrass/Prairie Sandreed Plant Community Phase (3.1):**

**Needleandthread/Sandreed/Bluestem/Kentucky Bluegrass Plant Community Phase (3.2):**

**Smooth Brome/Kentucky Bluegrass Plant Community Phase (4.1):**

**Kentucky Bluegrass/Sedge Plant Community Phase (4.2):**

**Annual/Pioneer, Non-native Perennial Plant Community Phase (4.3):**

### Animal Preferences (Quarterly – 1,2,3,4<sup>†</sup>)

Common Name	Cattle	Sheep	Horses	Deer	Antelope	Bison	Elk
<b>Grasses and grasslikes</b>							
big bluestem	U D P D	U D U U	U D P D	U D U U	U D U U	U D P D	U D P D
Indiangrass	U D P D	U D U U	U D P D	U D U U	U D U U	U D P D	U D P D
needleandthread	U D U D	N D N U	U D U D	N D N U	N D N U	U D U D	U D U D
porcupine grass	U P U D	N D N U	U P U D	N D N U	N D N U	U P U D	U P U D
green needlegrass	U P U D	N P N P	U P U D	N P N P	N P N P	U P U D	U P U D
prairie junegrass	U D U D	N D N U	U D U D	N D N U	N D N U	U D U D	U D U D
threadleaf sedge	U D U D	U P N D	U D U D	U D U D	U D U D	U D U D	U D U D
sand dropseed	N U N N	N U N N	N U N N	N U N N	N U N N	N U N N	N U N N
prairie sandreed	U D D U	U D U U	U D D U	U U D U	U U D U	U D D U	U D D U
switchgrass	U D D U	U D U U	U D D U	N N N N	N N N N	U D D U	U D D U
Canada wildrye	U D U U	N U N N	U D U U	N U N N	N U N N	U D U U	U D U U
little bluestem	U D D U	N D N N	U D D U	N D N N	N D N N	U D D U	U D D U
sideoats grama	U D P U	U P D U	U D P U	U P D U	U P D U	U D P U	U D P U
western wheatgrass	U P D U	N D N N	U P D U	N D N N	N D N N	U P D U	U P D U
slender wheatgrass	U P U U	N D U N	U P U U	N D U N	N D U N	U P U U	U P U U
blue grama	U D P U	D P P D	U D P U	D P P D	D P P D	U D P U	U D P U
Scribner panicum	U U D U	N U N N	U U D U	N U N N	N U N N	U U D U	U U D U
Wilcox panicum	U U U U	N U N N	U U U U	N U N N	N U N N	U U U U	U U U U
<b>Forbs</b>							
American licorice	U U D U	N U U N	U U D U	N U U N	N U U N	U U D U	N U U N
American vetch	U D P U	U P P U	U D P U	U P P U	U P P U	U D P U	U P P U
cudweed sagewort	U U U U	U U D U	U U U U	U U D U	U U D U	U U U U	U U D U
curlycup gumweed	U U U U	N N N N	U U U U	N N N N	N N N N	U U U U	N N N N
dotted gayfeather	U U D U	U P P U	U U D U	U P P U	U P P U	U U D U	U P P U
false boneset	U U D U	N D U N	U U D U	N D U N	N D U N	U U D U	N D U N
goldenrod	U U D U	N U U N	U U D U	N U U N	N U U N	U U D U	N U U N
heath aster	U U D U	U U P U	U U D U	U U P U	U U P U	U U D U	U U P U
hoary puccoon	U U U U	N U U N	U U U U	N U U N	N U U N	U U U U	N U U N
penstemon	U U U U	U P P U	U U U U	U P P U	U P P U	U U U U	U P P U
prairie coneflower	U U D U	U P P U	U U D U	U P P U	U P P U	U U D U	U P P U
prairie groundsel	T T T T	T T T T	T T T T	T T T T	T T T T	T T T T	T T T T
purple coneflower	U U D U	U P P U	U U D U	U P P U	U P P U	U U D U	U P P U
purple prairie clover	U D P U	U P P U	U D P U	U P P U	U P P U	U D P U	U P P U
rush skeletonweed	U U U U	N N N N	U U U U	N N N N	N N N N	U U U U	N N N N
scarlet gaura	U U U U	N U U N	U U U U	N U U N	N U U N	U U U U	N U U N
scurfpea	U U U U	N U U N	U U U U	N U U N	N U U N	U U U U	N U U N
stiff sunflower	U D P U	U D P U	U D P U	U D P U	U D P U	U D P U	U D P U
western ragweed	U U U U	N N N N	U U U U	N N N N	N N N N	U U U U	N N N N
western yarrow	U U U U	N U U N	U U U U	N U U N	N U U N	U U U U	N U U N
<b>Shrubs</b>							
fringed sagewort	U U U U	U U U U	U U U U	U D D U	U P P D	U U U U	U U U D
leadplant	U P D U	U P D U	U P D U	U P D U	U P D U	U P D U	U P D U
rose	U D D U	U D D U	U D D U	U D D U	U D D U	U D D U	U D D U
snowberry	U U U U	U U U U	U U U U	D U D D	U U U U	U U U U	D U U U

**N** = not used; **U** = undesirable; **D** = desirable; **P** = preferred; **T** = toxic

<sup>†</sup> Quarters: 1 – Jan., Feb., Mar.; 2 – Apr., May, Jun.; 3 – Jul., Aug., Sep.; 4 – Oct., Nov., Dec.

## Animal Community – Grazing Interpretations

The following table lists annual, suggested initial stocking rates with average growing conditions. These are conservative estimates that should be used only as guidelines in the initial stages of conservation planning. Often, the current plant composition does not entirely match any particular plant community (as described in this ES description). Because of this, a resource inventory is necessary to document plant composition and production. More accurate carrying capacity estimates should eventually be calculated using the following stocking rate information along with animal preference data and actual stocking records particularly when grazers other than cattle are involved. With consultation of the land manager, more intensive grazing management may result in improved harvest efficiencies and increased carrying capacity.

Plant Community	Average Annual Production (lbs./acre, air-dry)	Stocking Rate* (AUM/acre)
Bluestem/Needlegrass/Prairie Sandreed (1.1):	2,800	0.77
Needleandthread/Sandreed/Bluestem/Kentucky Bluegrass (3.2):	2,200	0.60
Smooth Brome/Kentucky Bluegrass (4.1):	2,900	0.79
Kentucky Bluegrass/Sedge (4.2):	1,800	0.49
Annual/Pioneer, Non-native Perennial (4.3):	1,200	0.33

\*Based on 912 lbs./acre (air-dry weight) per Animal Unit Month (AUM), and on 25 percent harvest efficiency (refer to United States Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS) National Range and Pasture Handbook).

Grazing by domestic livestock is one of the major income-producing industries in the area. Rangeland in this area may provide yearlong forage. During the dormant period, the forage for livestock will likely be lacking protein to meet livestock requirements and added protein will allow ruminants to better utilize the energy stored in grazed plant materials. A forage quality test (either directly or through fecal sampling) should be used to determine the level of supplementation needed.

## Hydrology Functions

Water is the principal factor limiting forage production on this site. This site is dominated by soils in hydrologic groups A and B. Infiltration is typically high and runoff low on this site high depending on soil hydrologic group, slope and ground cover. In many cases, areas with greater than 75 percent ground cover have the greatest potential for high infiltration and lower runoff. An example of an exception would be where shortgrasses form a strong sod and dominate the site. Dominance by blue grama, sedge, bluegrass, and/or smooth brome grass will result in reduced infiltration and increased runoff. Areas where ground cover is less than 50 percent 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, hiking, photography, bird watching, and other opportunities. The wide varieties of plants that bloom from spring until fall have an esthetic value that appeals to visitors.

## Wood Products

No appreciable wood products are typically present on this site.

## Other Products

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

## Supporting Information

### Associated Sites

Loamy (R053CY010SD), Thin Upland (R053CY012SD), Loamy Overflow (R053CY020SD)

### Similar Sites

(R053CY020SD) – Loamy Overflow [more big bluestem; higher production]

(R053CY010SD) – Loamy [more green needlegrass and western wheatgrass; less needleandthread]

### Inventory Data References

Information presented here has been derived from NRCS clipping data and other inventory data. Field observations from range-trained personnel were also used. Those involved in developing this site include: Stan Boltz, Range Management Specialist (RMS), NRCS; Shane Deranleau, RMS, NRCS; and Mitch Faulkner, RMS, NRCS.

### State Correlation

This site has been correlated in SD in MLRA 53C.

### Field Offices/Counties

Chamberlain	Brule/Bufalo	Huron	Beadle	Plankinton	Aurora
Faulkton	Faulk	Miller	Hand	Selby	Walworth
Gettysburg	Potter	Onida	Sully	Wessington Springs	Jerauld
Highmore	Hyde	Pierre	Hughes		

### Relationship to Other Established Classifications

Level IV Ecoregions of the Conterminous United States: 42a – Missouri Coteau, 42e – Southern Missouri Coteau, 42f – Southern Missouri Coteau Slope.

### Other References

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USDA, NRCS, Various Published Soil Surveys.

### Site Description Approval

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SD, State Range Management Specialist

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Date