

## United States Department of Agriculture Natural Resources Conservation Service

### Ecological Site Description

**Site Name:** Sandy

**Site Type:** Rangeland

**Site ID:** R054XY026ND

**Major Land Resource Area (MLRA):** 54 – Rolling Soft Shale Plain

For more information on MLRA's, refer to the following web site: [http://www.essc.psu.edu/soil\\_info/soil\\_lrr/](http://www.essc.psu.edu/soil_info/soil_lrr/).



### Physiographic Features

This site occurs on gently undulating to rolling sedimentary uplands.

**Landform:** alluvial fan, alluvial flat, hill and knolls      **Aspect:** not applicable

	<u>Minimum</u>	<u>Maximum</u>
<b>Elevation (feet):</b>	1600	3600
<b>Slope (percent):</b>	2	20
<b>Water Table Depth (inches):</b>	48	>72
<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>	Low	Medium

### Climatic Features

MLRA 54 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 14 to 18 inches per year. The normal average annual temperature is about 42°F. January is the coldest month with average temperatures ranging from about 13°F (Beach, North Dakota (ND),) to about 16°F (Bison, South Dakota (SD)). July is the warmest month with temperatures averaging from about 69°F (Beach, ND,) to about 72°F (Timber Lake, SD). The range of normal average monthly temperatures between the coldest and warmest months is about 57°F. This large annual range attests to the continental nature of this MLRA's climate. Hourly winds are estimated to 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.

	<u>Minimum</u>	<u>Maximum</u>
<b>Frost-free period (days):</b>	119	136
<b>Freeze-free period (days):</b>	139	157
<b>Mean Annual Precipitation (inches):</b>	14	18

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

	<b>Precip. Min.</b>	<b>Precip. Max</b>	<b>Temp. Min.</b>	<b>Temp. Max.</b>
January	0.41	0.54	2.2	23.8
February	0.37	0.61	8.7	30.4
March	0.51	1.07	17.1	40.0
April	1.13	1.88	28.9	56.8
May	1.98	2.83	40.5	69.3
June	2.83	3.29	49.8	78.3
July	2.05	2.25	54.6	85.2
August	1.49	2.07	53.0	84.3
September	1.29	1.45	42.0	73.4
October	0.89	1.35	31.6	60.4
November	0.48	0.61	19.0	41.5
December	0.42	0.55	8.1	29.0

<b>Climate Stations</b>		<b>Period</b>	
<b>Station ID</b>	<b>Location or Name</b>	<b>From</b>	<b>To</b>
ND0590	Beach	1949	1999
MT7560	Sidney	1949	1999
SD8307	Timber Lake	1948	1999
ND2183	Dickinson FAA AP	1948	1999

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

**Influencing Water Features**

No significant water features influence this site.

**Representative Soil Features**

The common features of soils in this site are the loamy fine sand to fine sandy loam textured subsoils and slopes of 2 to 20 percent. The soils in this site are moderately well to well drained and formed in soft sandstone or alluvium. The fine sandy loam and sandy loam surface layer is 5 to 15 inches thick. The soils have a high to moderate infiltration rate. 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 with numerous debris dams or vegetative barriers. The soil surface is stable and intact. Subsurface soil layers are non-restrictive to water movement and root penetration.

These soils are susceptible to water and wind erosion. The hazard of water erosion increases on slopes greater than about 15 percent. Low available water capacity coupled with moderate

permeability strongly influences the soil-water-plant relationship. Loss of the soil surface layer can result in a shift in species composition and/or production.

Major soil series correlated to this ecological site can be found in Section II of the Natural Resources Conservation Service (NRCS) Field Office Technical Guide or the following web sites:

North Dakota: <http://www.nd.nrcs.usda.gov>.

South Dakota: <http://www.sd.nrcs.usda.gov>.

Montana: <http://www.mt.nrcs.usda.gov>.

**Parent Material Kind:** alluvium and residuum  
**Parent Material Origin:** sandstone, calcareous  
**Surface Texture:** fine sandy loam, sandy loam  
**Surface Texture Modifier:** none  
**Subsurface Texture Group:** sandy  
**Surface Fragments ≤ 3” (% Cover):** 0  
**Surface Fragments > 3” (%Cover):** 0  
**Subsurface Fragments ≤ 3” (% Volume):** 0-20  
**Subsurface Fragments > 3” (% Volume):** 0-10

	<u>Minimum</u>	<u>Maximum</u>
<b>Drainage Class:</b>	moderately well	well
<b>Permeability Class:</b>	moderate	moderately rapid
<b>Depth to first restrictive layer (inches):</b>	20	72
<b>Electrical Conductivity (mmhos/cm)*:</b>	0	4
<b>Sodium Absorption Ratio*:</b>	0	5
<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	7
<b>Calcium Carbonate Equivalent (percent)*:</b>	0	15

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

## Plant Communities

### Ecological Dynamics of the Site:

This site developed under Northern Great Plains climatic conditions and included natural influence of large herbivores and occasional fire. Changes will occur in the plant communities due to management actions and/or climatic conditions. Due to the nature of the soils, the site is considered moderately resilient. Under continued adverse impacts, a moderate decline in vegetative vigor and composition will occur. Under favorable vegetative management treatments the site can more readily return to the Historic Climax Plant Community (HCPC).

The plant community upon which interpretations are primarily based is the HCPC. The HCPC 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. Subclimax plant communities, states, transitional pathways, and thresholds have been determined through similar studies and experience.

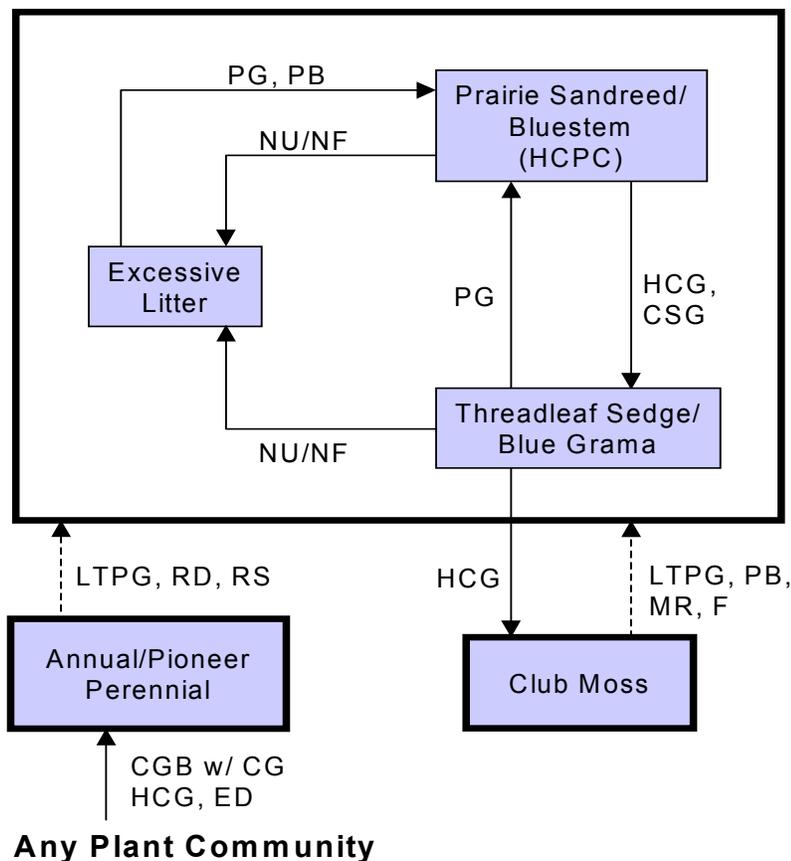
Heavy continuous grazing without adequate recovery periods following each grazing occurrence over several years causes this site to depart from the HCPC. Species such as prairie sandreed, big bluestem, and sand bluestem decrease in frequency and production. In time, heavy, continuous grazing will likely cause upland sedges and blue grama to dominate and pioneer perennials, annuals,

and club moss (in its range) to increase. This plant community is relatively stable and the competitive advantage prevents other species from establishing. This plant community is less productive than the HCPC. Runoff increases and infiltration will decrease. Soil erosion will be minimal.

Excessive defoliation or any type of physical disturbance can lead to serious erosion problems resulting in an increase in annual and pioneer perennial vegetation. Extended periods of non-use and/or lack of fire will result in a plant community having high litter levels, which favors an increase in Kentucky bluegrass and/or smooth brome grass.

The following is a diagram that illustrates the common plant communities that can occur on the site and the transition pathways between communities. The ecological processes will be discussed in more detail in the plant community descriptions following the diagram.

### Plant Communities and Transitional Pathways



**CGB w/ CG** - cropped go-back with continuous grazing; **CSG** - continuous seasonal grazing; **ED** - excessive defoliation; **F** - fertilization followed with prescribed grazing; **HCPC** - Historical Climax Plant Community; **HCG** - heavy continuous grazing; **LTPG** - long-term prescribed grazing; **MR** - mechanical renovation with prescribed grazing; **NU/NF** - extended period of non-use & no fire; **PB** - prescribed burning; **PG** - prescribed grazing; **RD** - removal of disturbance; **RS** - range seeding with prescribed grazing

**Plant Community Composition and Group Annual Production**

		Prairie Sandreed/Bluestem (HPC)			
COMMON/GROUP NAME	SYMBOL	Group	lbs./acre	% Comp	
<b>GRASSES &amp; GRASS-LIKES</b>			2040 - 2160	85 - 90	
		<b>1</b>	<b>240 - 600</b>	<b>10 - 25</b>	
prairie sandreed	CALO	1	240 - 600	10 - 25	
little bluestem	SCSC	1	0 - 120	0 - 5	
<b>BLUESTEM</b>		<b>2</b>	<b>240 - 480</b>	<b>10 - 20</b>	
sand bluestem	ANHA	2	120 - 480	5 - 20	
big bluestem	ANGE	2	120 - 480	5 - 20	
<b>NEEDLEGRASSES</b>		<b>3</b>	<b>120 - 216</b>	<b>5 - 9</b>	
needleandthread	HECOC8	3	120 - 216	5 - 9	
green needlegrass	NAV14	3	48 - 120	2 - 5	
porcupine grass	HESP11	3	0 - 72	0 - 3	
<b>GRAMA</b>		<b>4</b>	<b>120 - 192</b>	<b>5 - 8</b>	
blue grama	BOGR2	4	120 - 192	5 - 8	
hairy grama	BOHI2	4	0 - 120	0 - 5	
<b>OTHER NATIVE GRASSES</b>		<b>5</b>	<b>120 - 360</b>	<b>5 - 15</b>	
Scribner panicum	DIOLS	5	24 - 48	1 - 2	
western wheatgrass	PASM	5	72 - 144	3 - 6	
sand dropseed	SPCR	5	24 - 48	1 - 2	
sideoats grama	BOCU	5	0 - 120	0 - 5	
prairie junegrass	KOMA	5	24 - 48	1 - 2	
plains muhly	MUCU3	5	0 - 24	0 - 1	
Canada wildrye	ELCA4	5	0 - 24	0 - 1	
red threeawn	ARPUL	5	24 - 48	1 - 2	
other perennial grasses	2GP	5	0 - 48	0 - 2	
<b>GRASS-LIKES</b>		<b>6</b>	<b>96 - 168</b>	<b>4 - 7</b>	
threadleaf sedge	CAFI	6	72 - 144	3 - 6	
sun sedge	CAINH2	6	48 - 72	2 - 3	
Penn sedge	CAPE6	6	0 - 24	0 - 1	
other grass-like	2GL	6	0 - 24	0 - 1	
<b>FORBS</b>		<b>7</b>	<b>120 - 240</b>	<b>5 - 10</b>	
American vetch	VIAM	7	0 - 24	0 - 1	
cinquefoil	POTEN	7	0 - 24	0 - 1	
cudweed sagewort	ARLU	7	24 - 48	1 - 2	
false gromwell	ONMO	7	0 - 48	0 - 2	
gayfeather	LIATR	7	24 - 48	1 - 2	
goldenrod	SOLID	7	24 - 48	1 - 2	
green sagewort	ARDR4	7	24 - 48	1 - 2	
groundplum milkvetch	ASCR2	7	24 - 24	1 - 1	
hairy goldaster	HEV14	7	24 - 48	1 - 2	
Hood's phlox	PHHO	7	0 - 24	0 - 1	
Lambert crazyweed	OXLA3	7	0 - 24	0 - 1	
penstemon	PENST	7	24 - 48	1 - 2	
prairie clover	DALEA	7	24 - 48	1 - 2	
prairie coneflower	RACO3	7	24 - 24	1 - 1	
purple coneflower	ECAN2	7	0 - 24	0 - 1	
rush skeletonweed	LYJU	7	0 - 24	0 - 1	
scarlet globemallow	SPCO	7	0 - 24	0 - 1	
scurpea	PSORA2	7	24 - 48	1 - 2	
spiderwort	TRADE	7	24 - 24	1 - 1	
stiff sunflower	HEPA19	7	24 - 24	1 - 1	
wavyleaf thistle	CIUN	7	0 - 24	0 - 1	
western wallflower	ERCAC	7	24 - 24	1 - 1	
western yarrow	ACM12	7	24 - 24	1 - 1	
other perennial forbs	2FP	7	0 - 24	0 - 1	
<b>SHRUBS</b>		<b>8</b>	<b>48 - 120</b>	<b>2 - 5</b>	
rose	ROSA5	8	24 - 24	1 - 1	
leadplant	AMCA6	8	48 - 72	2 - 3	
yucca	YUGL	8	0 - 24	0 - 1	
fringed sagewort	ARFR4	8	24 - 48	1 - 2	
cactus	OPUNT	8	0 - 24	0 - 1	
western snowberry	SYOC	8	0 - 72	0 - 3	
silver sagebrush	ARCA13	8	0 - 48	0 - 2	
other shrubs	2SHRUB	8	0 - 48	0 - 2	
<b>CRYPTOGAMS</b>		<b>9</b>	<b>0 - 24</b>	<b>0 - 1</b>	
clubmoss	SEDE2	9	0 - 24	0 - 1	
<b>Annual Production lbs./acre</b>			<b>LOW</b>	<b>RV</b>	<b>HIGH</b>
<b>GRASSES &amp; GRASS-LIKES</b>			1340 -	2124	- 2800
<b>FORBS</b>			115 -	180	- 250
<b>SHRUBS</b>			45 -	84	- 125
<b>CRYPTOGAMS</b>			0 -	12	- 25
<b>TOTAL</b>			1500 -	2400	- 3300

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	Prairie Sandreed/ Bluestem (HCPC)			Threadleaf Sedge/Blue Grama			Excessive Litter			Club Moss			
		Grp	lbs./acre	% Comp	Grp	lbs./acre	% Comp	Grp	lbs./acre	% Comp	Grp	lbs./acre	% Comp	
<b>GRASSES &amp; GRASS-LIKES</b>														
		1	240 - 600	10 - 25	1	16 - 40	2 - 5	1	0 - 66	0 - 3	1	12 - 30	2 - 5	
prairie sandreed	CALO	1	240 - 600	10 - 25	1	16 - 40	2 - 5	1	0 - 66	0 - 3	1	12 - 30	2 - 5	
little bluestem	SCSC	1	0 - 120	0 - 5	1	0 - 24	0 - 3	1	0 - 44	0 - 2	1	0 - 18	0 - 3	
<b>BLUESTEM</b>		2	240 - 480	10 - 20	2			2	0 - 44	0 - 2	2			
sand bluestem	ANHA	2	120 - 480	5 - 20				2	0 - 22	0 - 1				
big bluestem	ANGE	2	120 - 480	5 - 20				2	0 - 44	0 - 2				
<b>NEEDLEGRASSES</b>		3	120 - 216	5 - 9	3	16 - 80	2 - 10	3	44 - 88	2 - 4	3	12 - 60	2 - 10	
needleandthread	HECOC8	3	120 - 216	5 - 9	3	16 - 80	2 - 10	3	44 - 88	2 - 3	3	12 - 60	2 - 10	
green needlegrass	NAV14	3	48 - 120	2 - 5					22 - 44	1 - 2				
porcupine grass	HESP11	3	0 - 72	0 - 3				3	0 - 44	0 - 2				
<b>GRAMA</b>		4	120 - 192	5 - 8	4	120 - 200	15 - 25	4	0 - 44	0 - 2	4	60 - 120	10 - 20	
blue grama	BOGR2	4	120 - 192	5 - 8	4	120 - 200	15 - 25	4	0 - 44	0 - 2	4	60 - 120	10 - 20	
hairy grama	BOH12	4	0 - 120	0 - 5	4	0 - 40	0 - 5	4	0 - 22	0 - 1	4	0 - 30	0 - 5	
<b>OTHER NATIVE GRASSES</b>		5	120 - 360	5 - 15	5	40 - 64	5 - 8	5	44 - 110	2 - 5	5	30 - 48	5 - 8	
Scribner panicum	DIOLS	5	24 - 48	1 - 2	5	16 - 24	2 - 3	5			5	12 - 18	2 - 3	
western wheatgrass	PASM	5	72 - 144	3 - 6	5	40 - 64	5 - 8	5	22 - 44	1 - 2	5	30 - 48	5 - 8	
sand dropseed	SPCR	5	24 - 48	1 - 2	5	16 - 40	2 - 5	5	22 - 22	1 - 1	5	12 - 30	2 - 5	
sideoats grama	BOCU	5	0 - 120	0 - 5	5	0 - 8	0 - 1				5	0 - 6	0 - 1	
prairie junegrass	KOMA	5	24 - 48	1 - 2	5	16 - 40	2 - 5	5	22 - 44	1 - 2	5	12 - 30	2 - 5	
plains muhly	MUCU3	5	0 - 48	0 - 2	5	0 - 8	0 - 1				5	0 - 6	0 - 1	
Canada wildrye	ELCA4	5	0 - 24	0 - 1	5	0 - 8	0 - 1	5	0 - 22	0 - 1	5	0 - 6	0 - 1	
red threeawn	ARPUL	5	24 - 48	1 - 2	5	40 - 64	5 - 8	5	0 - 22	0 - 1	5	30 - 48	5 - 8	
other perennial grasses	ZGP	5	0 - 48	0 - 2	5	0 - 8	0 - 1	5	0 - 22	0 - 1	5	0 - 6	0 - 1	
<b>GRASS-LIKES</b>		6	96 - 168	4 - 7	6	160 - 264	20 - 33	6	44 - 88	2 - 4	6	120 - 180	20 - 30	
threadleaf sedge	CAFI	6	72 - 144	3 - 6	6	120 - 264	15 - 33	6	44 - 88	2 - 4	6	90 - 180	15 - 30	
sun sedge	CAINH2	6	48 - 72	2 - 3	6	40 - 56	5 - 7	6	0 - 22	0 - 1	6	30 - 42	5 - 7	
Penn sedge	CAPE6	6	0 - 24	0 - 1				6	0 - 22	0 - 1				
other grass-likes	ZGL	6	0 - 24	0 - 1	6	8 - 24	1 - 3	6	0 - 22	0 - 1	6	6 - 18	1 - 3	
<b>NON-NATIVE GRASSES</b>		7			7	0 - 16	0 - 2	7	770 - 1210	35 - 55	7	0 - 12	0 - 2	
cheatgrass	BRTE				7	0 - 16	0 - 2	7	220 - 330	10 - 15	7	0 - 12	0 - 2	
crested wheatgrass	AOCR				7	0 - 16	0 - 2	7	550 - 1210	25 - 55	7	0 - 12	0 - 2	
smooth bromegrass	BRIN2				7	0 - 16	0 - 2	7	550 - 1210	25 - 55	7	0 - 12	0 - 2	
bluegrass	POA				7	0 - 16	0 - 2	7	550 - 1210	25 - 55	7	0 - 12	0 - 2	
<b>FORBS</b>		8	120 - 240	5 - 10	8	40 - 80	5 - 10	8	220 - 330	10 - 15	8	30 - 60	5 - 10	
American vetch	VIAM	8	0 - 24	0 - 1				8	0 - 22	0 - 1				
annual sunflower	HEAN3	8			8	8 - 16	1 - 2	8	22 - 44	1 - 2	8	6 - 12	1 - 2	
cinquefoil	POTEN	8	0 - 24	0 - 1										
common dandelion	TAOF	8			8	16 - 24	2 - 3	8	22 - 44	1 - 2	8	12 - 18	2 - 3	
cudweed sagewort	ARLU	8	24 - 48	1 - 2	8	24 - 32	3 - 4	8	22 - 44	1 - 2	8	18 - 24	3 - 4	
curlycup gumweed	GRSQ	8			8	8 - 24	1 - 3	8	0 - 22	0 - 1	8	6 - 18	1 - 3	
false gromwell	ONMO	8	0 - 48	0 - 2										
gayfeather	LIATR	8	24 - 48	1 - 2				8	0 - 22	0 - 1				
goldenrod	SOLID	8	24 - 48	1 - 2	8	8 - 8	1 - 1	8	22 - 44	1 - 2	8	6 - 6	1 - 1	
green sagewort	ARDR4	8	24 - 48	1 - 2	8	24 - 40	3 - 5	8	44 - 88	2 - 3	8	18 - 30	3 - 5	
groundplum milkvetch	ASCR2	8	24 - 24	1 - 1										
hairy goldaster	HEV14	8	24 - 48	1 - 2	8	16 - 24	2 - 3				8	12 - 18	2 - 3	
Hood's phlox	PHHO	8	0 - 24	0 - 1	8	8 - 8	1 - 1				8	6 - 6	1 - 1	
Lambert crazyweed	OXL3	8	0 - 24	0 - 1	8	8 - 16	1 - 2	8	0 - 22	0 - 1	8	6 - 12	1 - 2	
marestail	COCA5	8			8	8 - 24	1 - 3	8	0 - 22	0 - 1	8	6 - 18	1 - 3	
penstemon	PENST	8	24 - 48	1 - 2				8	0 - 22	0 - 1				
prairie clover	DALAE	8	24 - 48	1 - 2				8	0 - 22	0 - 1				
prairie coneflower	RACO3	8	24 - 24	1 - 1	8	16 - 24	2 - 3	8	22 - 44	1 - 2	8	12 - 18	2 - 3	
purple coneflower	ECA2	8	0 - 24	0 - 1	8	0 - 8	0 - 1	8	0 - 22	0 - 1	8	0 - 6	0 - 1	
pussytoes	ANTEN	8			8	8 - 16	1 - 2	8	0 - 22	0 - 1	8	6 - 12	1 - 2	
Rocky Mountain beeplant	CLSE	8			8	8 - 16	1 - 2	8	0 - 22	0 - 1	8	6 - 12	1 - 2	
rush skeletonweed	LYJU	8	0 - 24	0 - 1	8	8 - 8	1 - 1	8	0 - 22	0 - 1	8	6 - 6	1 - 1	
scarlet globemallow	SPCO	8	0 - 24	0 - 1	8	8 - 16	1 - 2	8	0 - 22	0 - 1	8	6 - 12	1 - 2	
scurfly	PSORA2	8	24 - 48	1 - 2	8	16 - 24	2 - 3	8	0 - 22	0 - 1	8	12 - 18	2 - 3	
spiderwort	TRADE	8	24 - 24	1 - 1										
stiff sunflower	HEPA19	8	24 - 24	1 - 1				8	0 - 22	0 - 1				
sweetclover	MELIL	8			8	8 - 40	1 - 5	8	0 - 220	0 - 10	8	6 - 30	1 - 5	
wayleaf thistle	CIUN	8	0 - 24	0 - 1	8	8 - 16	1 - 2	8	0 - 22	0 - 1	8	6 - 12	1 - 2	
western ragweed	AMPS	8			8	16 - 24	2 - 3	8	22 - 44	1 - 2	8	12 - 18	2 - 3	
western salsify	TRDU	8			8	8 - 16	1 - 2	8	22 - 44	1 - 2	8	6 - 12	1 - 2	
western wallflower	ERCAC	8	24 - 24	1 - 1				8	0 - 22	0 - 1				
western yarrow	ACMI2	8	24 - 24	1 - 1	8	8 - 16	1 - 2	8	0 - 22	0 - 1	8	6 - 12	1 - 2	
other perennial forbs	ZFP	8	0 - 24	0 - 1	8	0 - 8	0 - 1	8	0 - 22	0 - 1	8	0 - 6	0 - 1	
other annual forbs	ZFA	8			8	8 - 16	1 - 2	8	22 - 44	1 - 2	8	6 - 12	1 - 2	
<b>SHRUBS</b>		9	48 - 120	2 - 5	9	8 - 40	1 - 5	9	110 - 220	5 - 10	9	6 - 30	1 - 5	
rose	ROSA5	9	24 - 24	1 - 1	9	8 - 16	1 - 2	9	0 - 22	0 - 1	9	6 - 12	1 - 2	
leadplant	AMCA6	9	48 - 72	2 - 3				9	0 - 22	0 - 1				
yucca	YUGL	9	0 - 24	0 - 1	9	8 - 24	1 - 3	9	22 - 22	1 - 1	9	6 - 18	1 - 3	
fringed sagewort	ARFR4	9	24 - 48	1 - 2	9	24 - 48	3 - 6	9	22 - 44	1 - 2	9	18 - 36	3 - 6	
cactus	OPUNT	9	0 - 24	0 - 1	9	8 - 24	1 - 3	9	0 - 22	0 - 1	9	6 - 18	1 - 3	
western snowberry	SYOC	9	0 - 72	0 - 3	9	0 - 8	0 - 1	9	88 - 132	4 - 6	9	0 - 6	0 - 1	
silver sagebrush	ARCA13	9	0 - 48	0 - 2	9	0 - 16	0 - 2	9	88 - 132	4 - 6	9	0 - 12	0 - 2	
creeping juniper	JUHO2	9			9	8 - 16	1 - 2	9	0 - 22	0 - 1	9	6 - 12	1 - 2	
other shrubs	ZSHRUB	9	0 - 48	0 - 2	9	0 - 8	0 - 1	9	0 - 22	0 - 1	9	0 - 6	0 - 1	
<b>CRYPTOGAMS</b>		10	0 - 24	0 - 1	10	8 - 16	1 - 2	10			10	30 - 60	5 - 10	
clubmoss	SEDE2	10	0 - 24	0 - 1	10	8 - 16	1 - 2				10	30 - 60	5 - 10	
<b>Annual Production lbs./acre</b>			LOW	RV	HIGH	LOW	RV	HIGH	LOW	RV	HIGH	LOW	RV	HIGH
<b>GRASSES &amp; GRASS-LIKES</b>			1340	2124	2900	455	704	950	1080	1760	2425	350	492	735
<b>FORBS</b>			115	180	250	35	60	85	215	275	350	25	45	65
<b>SHRUBS</b>			45	84	125	5	24	45	105	165	225	0	18	35
<b>CRYPTOGAMS</b>			0	12	25	5	12	20				25	45	65
<b>TOTAL</b>			1500	2400	3300	500	800	1100	1400	2200	3000	400	600	900

**Plant Communities** 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.

Following are the narratives for each of the described plant communities. These plant communities may not represent every possibility, but they are the most prevalent and repeatable plant

communities. The plant composition tables shown above have been developed from the best available knowledge at the time of this revision. As more data are collected, some of these plant communities may be revised or removed, and new ones may be added. None of these plant communities should necessarily be thought of as “Desired Plant Communities” (DPC). According to the USDA NRCS National Range and Pasture Handbook, DPC’s will be determined by the decision-makers and will meet minimum quality criteria established by the NRCS. The main purpose for including any description of a plant community here is to capture the current knowledge and experience at the time of this revision.

**Prairie Sandreed/Bluestem Plant Community**

This is the interpretive plant community and is considered to be the HCPC. This community evolved with grazing by large herbivores and occasional prairie fire. It is well suited for grazing by domestic livestock and can be found on areas that are properly managed with prescribed grazing that allows for proper utilization, changes in season of use and adequate recovery periods following each grazing event.

The potential vegetation is about 85 percent grasses or grass-like plants, 10 percent forbs, and 5 percent shrubs. Dominant grasses include prairie sandreed, and sand bluestem. Other grasses and grass-likes include needleandthread, blue grama, green needlegrass, porcupine grass, western wheatgrass, and threadleaf and sun sedge. Significant forbs include penstemon, American vetch, green sagewort, silverleaf scurfpea, and spiderwort. In many areas, western snowberry is the principal shrub and occurs in patchy mosaics. In other areas, silver sagebrush is the dominant shrub and occurs more evenly dispersed across the site. Other shrubs include prairie rose, leadplant, fringed sagewort, and yucca.

This plant community is well adapted to the Northern Great Plains climatic conditions. Individual species can vary greatly in production depending on growing conditions (timing and amount of precipitation and temperature). Community dynamics, nutrient cycle, water cycle, and energy flow are functioning properly. Plant litter is properly distributed with little movement offsite and natural plant mortality is very low. The diversity in species allows for high drought tolerance. Run-off from adjacent sites and moderate or high available water capacity provides a favorable soil-water-plant relationship.

The following growth curve shows the estimated monthly percentages of total annual growth of the dominant species expected during a normal year.

Growth curve number: ND5403

Growth curve name: Missouri Slope, Native Grasslands, Warm-season dominant.

Growth curve description: Warm-season, tall/mid grass dominant.

JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
0	0	0	4	17	40	30	8	1	0	0	0

Transitional pathways and/or community pathways leading to other plant communities are as follows:

- Non-use and no fire for extended periods of time will convert this plant community to the *Excessive Litter Plant Community*.
- Heavy, continuous grazing or continuous seasonal (spring) grazing will convert the plant community to the *Threadleaf Sedge/Blue Grama Plant Community*.
- Excessive defoliation (i.e., areas of heavy animal concentration) will convert the plant community to the *Annual/Pioneer Perennial Plant Community*.
- Cropped go-back land with continuous grazing will convert this plant community to the *Annual/Pioneer Perennial Plant Community*.

### Threadleaf Sedge/Blue Grama Plant Community

This plant community is the result of long-term, heavy, continuous grazing and/or annual, early spring seasonal grazing. Threadleaf sedge and blue grama are the dominant species. Other grasses include western wheatgrass, red threeawn, sand dropseed, needleandthread, and prairie junegrass. Forbs such as western ragweed, green sagewort, hairy goldaster, cudweed sagewort, scarlet globemallow, and sweet clover may also be present.

Annual production and consequently litter amounts have been reduced substantially. Nutrient cycle, water cycle, and energy flow are becoming impaired. This plant community is at risk of losing all tall warm season grasses. Wind erosion is a concern where cover has been reduced or eliminated.

The following growth curve shows the estimated monthly percentages of total annual growth of the dominant species expected during a normal year.

Growth curve number: ND5408

Growth curve name: Missouri Slope, Sedge Dominant.

Growth curve description: Cool-season, short grasses and grass-likes.

JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
0	0	3	10	30	25	20	5	5	2	0	0

Transitional pathways and/or community pathways leading to other plant communities are as follows:

- Heavy, continuous grazing may cause further deterioration resulting in a shift to the *Club Moss Plant Community*.
- Heavy, continuous grazing and/or excessive defoliation may shift this plant community to the *Annual/Pioneer Perennial Plant Community*.
- Non-use (rest) and exclusion of fire over an extended period of time will move this plant community to the *Excessive Litter Plant Community*. This shift may take considerably longer than the corresponding transition from HCPC, depending on how much residual cool-season mid-grasses are present upon initiation of non-use or fire exclusion.
- Prescribed grazing that includes changing season of use and allowing adequate recovery periods to enhance cool season grasses will lead this plant community back to the *Prairie Sandreed/Bluestem Plant Community*.

### Excessive Litter Plant Community

This plant community develops after an extended period of 10 or more years of non-use by herbivores and exclusion of fire. Non-native grasses, such as Kentucky bluegrass, crested wheatgrass, and smooth brome grass, tend to invade and may dominate this plant community. Other grasses present include prairie sandreed, needleandthread, prairie Junegrass, western wheatgrass, and green needlegrass. The common forbs include sweetclover, green sagewort, cudweed sagewort, western salsify, and western ragweed. Western snowberry and/or silver sagebrush, and prairie rose are the principal shrubs and may increase in density and cover.

Litter buildup reduces plant vigor and density, and native seedling recruitment declines. Due to a lack of tiller stimulation and sunlight, native bunchgrasses typically develop dead centers and native rhizomatous grasses are limited to small colonies. This plant community is dispersed throughout the pasture, encircling spot grazed areas, and areas distant from water sources. This is a typical pattern found in properly stocked pastures grazed season-long.

This plant community is resistant to change without prescribed grazing and/or fire. The combination of both grazing and fire is most effective in moving this plant community towards the HCPC. Soil

erosion is low. Runoff is similar to the HCPC. Once this plant community is reached, time and external resources will be needed to see any immediate recovery in diversity.

The following growth curve shows the estimated monthly percentages of total annual growth of the dominant species expected during a normal year.

Growth curve number: ND5406

Growth curve name: Missouri Slope, Introduced Cool-season Grasses.

Growth curve description: Introduced cool-season grasses.

JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
0	0	3	10	35	35	5	2	8	2	0	0

Transitional pathways and/or community pathways leading to other plant communities are as follows:

- Prescribed grazing or prescribed burning followed by prescribed grazing will move this plant community toward the *Prairie Sandreed/Bluestem Plant Community (HCPC)*. This would require long-term management with prescribed grazing and/or prescribed burning under controlled conditions.

### Club Moss Plant Community

Grasses and grass-like plants include prairie sandreed, western wheatgrass, needleandthread, blue grama, upland sedges, and prairie junegrass. Forbs commonly found in this plant community include green sagewort and hairy goldaster. When compared to the Prairie Sandreed/Bluestem Plant Community, sedges, blue grama, and club moss have increased, while prairie sandreed, big bluestem, and sand bluestem have decreased.

This plant community typically occurs in the western portion of MLRA 54. A dense sod of club moss dominates this plant community. Club moss occupies bare soil areas within deteriorated or disturbed higher successional plant communities due to long-term repeated disturbances. Club moss cover is often 25 percent or greater. Club moss creates a more arid microclimate, resulting in extreme competition for available moisture. Initial runoff rates are low but then increase as clubmoss becomes saturated. Once clubmoss has been saturated then runoff increases and infiltration decreases as compared HCPC. Vigor and production of other species is reduced dramatically.

The following growth curve represents monthly percentages of total annual growth of the dominant species during a normal year.

Growth curve number: ND5404

Growth curve name: Missouri Slope, Warm-season Dominant, Cool-season Subdominant.

Growth curve description: Short warm-season dominant, mid cool-season subdominant, and club moss.

JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
0	0	1	5	20	38	25	8	3	0	0	0

Transitional pathways and/or community pathways leading to other plant communities are as follows:

- Fertilization combined with prescribed grazing will move this plant community to the *Threadleaf Sedge/Blue Grama Plant Community*, and subsequently through the successional stages leading toward the *Prairie Sandreed/Bluestem Plant Community*.
- Mechanical renovation followed by prescribed grazing will reduce club moss, increase western wheatgrass, and eventually shift this plant community back toward the *Prairie Sandreed/Bluestem Plant Community*.
- Prescribed burning, with sufficient amounts and continuity of fuel, will reduce club moss, and may convert this plant community back to the *Prairie Sandreed/Bluestem Plant Community*.

- Long-term prescribed grazing with adequate recovery periods following each grazing event and proper stocking over long periods of time will move this plant community toward the *Threadleaf Sedge/Blue Grama Plant Community*. It may eventually return to the *HCPC* or associated successional plant community stages assuming an adequate seed/vegetative source is available. This process may take greater than 20 years.

### **Annual/Pioneer Perennial Plant Community**

This plant community develops under severe disturbance and/or excessive defoliation. This can result from heavy livestock or wildlife concentration, and cropping abandonment (go-back land). The dominant vegetation includes pioneer annual grasses, forbs, invaders, and early successional biennial and perennial species. Grasses may include red threeawn, smooth brome, crested wheatgrass, annual brome, needleandthread, prairie Junegrass, sand dropseed, sandbur, Scribner's Panicum, and western wheatgrass. The dominant forbs include curlycup gumweed, maretail, salsify, kochia, field bindweed, thistles, western ragweed, pussytoes, prostrate verbena, and other early successional species. Shrubs that may be present include prairie rose, fringed sage, and broom snakeweed. Plant species from adjacent ecological sites may become minor components of this plant community. The community also is susceptible to invasion of nonnative species due to severe soil disturbances and relatively high percent of bare ground. Many annual and perennial forbs, including nonnative species, have invaded the site.

This plant community is resistant to change, as long as soil disturbance or severe vegetation defoliation persists, thus holding back secondary plant succession. Soil erosion is potentially high in this vegetation state.

Significant economic inputs, management, and time would be required to move this plant community toward a higher successional stage and a more productive plant community. Secondary succession is highly variable, depending upon availability and diversity of a viable seed bank of higher successional species within the existing plant community and neighboring plant communities. This plant community can be renovated to improve the production capability, but management changes would be needed to maintain the new plant community.

Transitional pathways and/or community pathways leading to other plant communities are as follows:

- Long-term prescribed grazing and/or removal of disturbance, including adequate rest periods, will move this plant community through the successional stages, and may eventually lead to the *Prairie Sandreed/Bluestem Plant Community (HCPC)*. Depending on the slope, aspect, and size, and if adequate perennial plants exist, this change can occur more rapidly. This process will likely take a long period of time (50+ years).

## **Ecological Site Interpretations**

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

-- Under Development --

**Prairie Sandreed/Bluestem Plant Community:**

**Threadleaf Sedge/Blue Grama Plant Community:**

**Excessive Litter Plant Community:**

**Club Moss Plant Community:**

**Annual/Pioneer Perennial Plant Community:**

### Animal Preferences (Quarterly – 1,2,3,4†)

Common Name	Cattle	Sheep	Horses	Deer	Antelope	Bison	Elk
<b>Grasses &amp; Grass-likes</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
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
bluegrass	U D U U	D P U D	U D U U	U P N D	U P N D	U D U U	U D U 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
crested wheatgrass	U P U D	U P N N	U P U D	U P N N	U P N N	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
hairy 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
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
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
plains muhly	U U D U	U U D U	U U D U	N N N N	N N N N	U U D U	U U D U
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
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
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
red threeawn	N N N N	N N N N	N N N N	N N N N	N N N N	N N N N	N N N N
sand 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
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
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
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
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
smooth brome	U P U U	U P U U	U P U U	U P U U	U P U U	U P U U	U P U 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
<b>Forbs</b>							
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
cinquefoil	U U D U	U U U U	U U D U	U U U U	U U U U	U U D U	U U U U
cutweed 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
false gromwell	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
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
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
green sagewort	U U U U	U U U U	U U U U	U U U U	U U U U	U U U U	U U U U
groundplum milkvetch	U D U U	U D D U	U D U U	U D D U	U D D U	U D U U	U D D U
hairy goldaster	U U D U	N N N N	U U D U	N N N N	N N N N	U U D U	N N N N
Hood's phlox	U D U U	U P P U	U D U U	U P P U	U P P U	U D U U	U P P U
Lambert crazyweed	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
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 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
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
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
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 globemallow	U U D U	U D D U	U U D U	U D D U	U D D U	U U D U	U D D U
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
spiderwort	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
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
wavyleaf thistle	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 wallflower	U D U U	N U U N	U D U U	N U U N	N U U N	U D U U	N U U 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>							
cactus	N N N N	N N N N	N N N N	N N N N	N N N N	N N N N	N N N N
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
silver sagebrush	D U U D	D U U D	D U U D	P D D P	P P P P	D U U D	D U U D
western 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
yucca	D N N D	D U U D	D N N D	D U U D	D U U D	D N N D	D U U D
<b>Cryptogams</b>							
clubmoss	N N N N	N N N N	N N N N	N N N N	N N N N	N N N N	N N N N

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

† 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 suggested initial stocking rates for cattle under continuous grazing (year long grazing or growing season long grazing) under normal growing conditions; however, *continuous grazing is not recommended*. These are conservative estimates that should be used only as guidelines in the initial stages of the conservation planning process and may need to be adjusted due to diet preferences of other types or kinds of livestock and/or other factors. Often, the current plant composition does not entirely match any particular plant community (as described in this ecological site description). Because of this, a field visit is recommended, in all cases, to document plant composition and production. More precise carrying capacity estimates should eventually be calculated using the following stocking rate information along with animal preference data, 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	Production (lbs./acre)	Carrying Capacity <sup>1</sup> (AUM/acre)
Prairie Sandreed/Bluestem (HCPC)	2400	0.76
Excessive Litter	2200	0.69 <sup>2</sup>
Threadleaf Sedge/Blue Grama	800	0.25
Club Moss	600	0.19
Annual/Pioneer Perennial	-- <sup>3</sup>	-- <sup>3</sup>

<sup>1</sup> Continuous season-long grazing by cattle under average growing conditions.

<sup>2</sup> Stocking rates may need to be adjusted due to palatability and/or availability of forage.

<sup>3</sup> Highly variable; stocking rate needs to be determined onsite.

## Hydrology Functions

Water is the principal factor limiting production on this site. The soils are dominated by hydrologic group B, and localized areas in hydrologic group C. Infiltration varies from moderate to moderately rapid and runoff potential varies from very low to low for this site depending on soil hydrologic group 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 exception would be where short grasses form a dense sod and dominate the site. Greatest potential for reduced infiltration and high runoff are areas with ground cover of less than 50 percent (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 varieties 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.

## Supporting Information

### Associated Sites

(054XY031ND) – Loamy (054XY027ND) – Sandy Claypan (054XY045ND) – Limy Sands  
(054XY023ND) – Loamy Overflow (054XY042ND) – Sandy Terrace  
(054XY025ND) – Sands (054XY043ND) – Shallow Sandy

### Similar Sites

(054XY031ND) – Loamy (Ly)

[Does not receive additional moisture. Found on dry uplands upslope from loamy terraces or loamy overflow sites, down slope from thin loamy or shallow loam sites; similar landscape position as sandy, sands, clayey sites. Will ribbon greater than one inch and up to two inches. Indicator species are western wheatgrass some green needlegrass and blue grama, with fringed sagewort and western snowberry being the dominant shrubs. This site has no prairie sandreed or sand bluestem, less needleandthread and sedges, more blue grama, green needlegrass and western wheatgrass, similar production, similar landscape position, different soil texture.]

(054XY027ND) – Sandy Claypan (SyCp)

[Well drained soils on uplands and terraces that don't receive extra moisture with a dense sodic subsoil below 6 inches with salts below 16 inches. Subsoil will ribbon up to one inch. Indicator species are western wheatgrass intermixed with areas of prairie sandreed both dominating with an understory of needleandthread and blue grama, heath aster, cudweed sagewort and western yarrow along with fringed sagewort. This site has a dense sodic subsoil below 6 inches with salts below 16 inches, far more western wheatgrass, blue grama, less prairie sandreed, and sand bluestem, less production.]

(054XY042ND) – Sandy Terrace (SyT)

[Well drained soils on a river or stream terrace in a position that will flood occasionally (once in 10 years) with no apparent water table. Indicator species are prairie sandreed evenly mixed with sand bluestem, some Canada wildrye, penstemon, and leadplant and/or western snowberry, and with possible trees. This site has more production, different landscape position and more potential to flood occasionally, similar species composition with more silver sagebrush and/or western snowberry and sporadic trees.]

(054XY025ND) – Sands (Sa)

[Does not receive additional moisture. Found on dry uplands, upslope from sandy terraces or loamy overflow sites, down slope from limy sands or shallow sandy 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 sand bluestem, needleandthread, and sedges, less blue grama, green needlegrass and western wheatgrass, slightly more production, similar landscape position.]

(054XY043ND) – Shallow Sandy (SwSy)

[Some what excessively drained soils more than 10 less than 20 inches to sedimentary sandstone bedrock and/or gravels that restricts root penetration. Surface layer will ribbon less than one inch unless above gravels than more

than one but less than two inches. Upslope from thin loamy, limy sands, sands or sandy sites and some times down slope form very shallow ecological sites. Indicator species: little bluestem, prairie sandreed, sand bluestem, and needle grasses, with dotted gayfeather, pasqueflower, purple coneflower and purple prairie clover, and shrubs like prairie rose and yucca. This site has less production, a limiting layer above 20 inches, more little bluestem, plains muhly, sideoats grama, less prairie sandreed, usually different landscape positions.]

(054XY034ND) – Thin Sands (TSa)

[Deep entisol found on knobs and ridges of level to choppy sand blown plains; will not ribbon, found upslope from sands and sandy terrace sites; won't ribbon. Indicator species: Sand bluestem, prairie sandreed, and needleandthread evenly mixed, some Canada wildrye, penstemon, lemon scurfpea western ragweed, yucca, silky prairie clover, and leadplant. This site has less production, thin "A" horizon, no mollic epipedon, different soil texture, lime within six inches to the surface, less sand bluestem and prairie sandreed, more western wheatgrass, blue grama and green needlegrass, similar landscape positions.]

(054XY045ND) – Limy Sands (LSa)

[Moderately deep entisol, usually calcareous within four inches to the surface, found on knobs and/or sideslopes of hills and buttes; will not form a ribbon; up slope of sands or sandy and down slope from shallow sandy ecological sites. Indicator species: Little bluestem, sand bluestem, and prairie sandreed, along with penstemon, silverleaf scurfpea, purple coneflower, yucca, creeping juniper, and leadplant. This site has less production, thin "A" horizon, no mollic epipedon, lime within six inches to the surface, more little bluestem, plains muhly, sideoats grama, less prairie sandreed, different landscape positions.]

### Inventory Data References

Information presented here has been derived from NRCS clipping and other 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: Dennis Froemke, NRCS Range Management Specialist; Dean Chamrad, NRCS State Range Management Specialist; Jeff Printz, NRCS State Range Management Specialist; L. Michael Stirling, NRCS Range Management Specialist; Stan Boltz, NRCS Range Management Specialist; Josh Saunders, NRCS Range Management Specialist; Darrell Vanderbusch, NRCS Resource Soil Scientist; Michael D. Brand, State Land Dept. Director Surface Management; David Dewald, NRCS State Biologist; and Brad Podoll, NRCS Biologist.

<u>Data Source</u>	<u>Number of Records</u>	<u>Sample Period</u>	<u>State</u>	<u>County</u>
SCS-RANGE-417	9	1978 – 1979	ND	Adams, Grant, Hettinger
Ocular Estimates	15	1987 – 2001	ND	Adams, Bowman, Dunn, Emmons, Mercer, McKenzie, Morton, Stark

### State Correlation

This site has been correlated with Montana and South Dakota in MLRA 54.

### Field Offices

Baker, MT	Buffalo, SD	Faith, SD	Mott, ND
Beach, ND	Carson, ND	Hettinger, ND	Selfridge, ND
Beulah, ND	Culbertson, MT	Killdeer, ND	Sidney, MT

**Site Type: Rangeland**

**MLRA: 54 – Rolling Soft Shale Plain**

Bison, SD

Bowman, ND

Dickinson, ND

Dupree, SD

Mandan, ND

McIntosh, SD

**Sandy  
R054XY026ND**

Watford City, ND

Wibaux, MT

## Relationship to Other Established Classifications

Level IV Ecoregions of the Conterminous United States: 43a – Missouri Plateau.

## Other References

High Plains Regional Climate Center, University of Nebraska, 830728 Chase Hall, Lincoln, NE 68583-0728. (<http://hpccsun.unl.edu>).

USDA, NRCS. National Water and Climate Center, 101 SW Main, Suite 1600, Portland, OR 97204-3224. (<http://www.wcc.nrcs.usda.gov>).

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## Site Description Approval

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State Range Management Specialist

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Date

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Date

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Date