

United States Department of Agriculture Natural Resources Conservation Service

Ecological Site Description

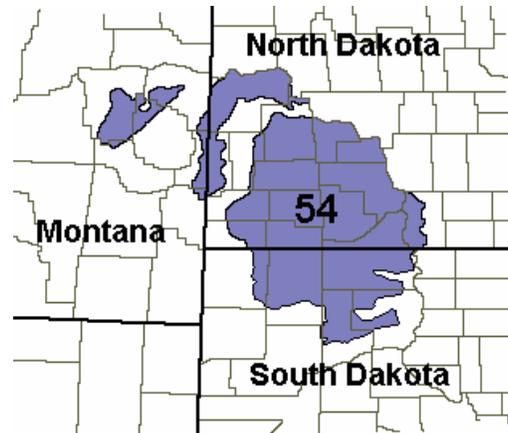
Site Name: Sands

Site Type: Rangeland

Site ID: R054XY025ND

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/.



Physiographic Features

This site typically occurs on nearly level to moderately steep sedimentary uplands.

Landform: knoll, hill, stream terrace

Aspect: N/A

	<u>Minimum</u>	<u>Maximum</u>
Elevation (feet):	1600	3600
Slope (percent):	1	25
Water Table Depth (inches):	None	None
Flooding:		
Frequency:	None	None
Duration:	None	None
Ponding:		
Depth (inches):	None	None
Frequency:	None	None
Duration:	None	None
Runoff Class:	Negligible	Low

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>
Frost-free period (days):	119	136
Freeze-free period (days):	139	157
Mean Annual Precipitation (inches):	14	18

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

	Precip. Min.	Precip. Max	Temp. Min.	Temp. Max.
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

Climate Stations		Period	
Station ID	Location or Name	From	To
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 and fine sand textured subsoils and slopes of typically 1 to 25 percent. The soils in this site are well to somewhat excessively drained and formed in soft sandstone, eolian deposits, or alluvium. The loamy fine sand to loamy sand surface layer is 4 to 20 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 with numerous debris dams or vegetative barriers. The soil surface is stable and intact.

These soils are susceptible to water and wind erosion. 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, eolian deposits, and residuum
Parent Material Origin: sandstone, calcareous
Surface Texture: loamy fine sand, loamy sand
Surface Texture Modifier: none
Subsurface Texture Group: sandy
Surface Fragments ≤ 3” (% Cover): 0
Surface Fragments > 3” (%Cover): 0
Subsurface Fragments ≤ 3” (% Volume): 0-10
Subsurface Fragments > 3” (% Volume): 0-5

	<u>Minimum</u>	<u>Maximum</u>
Drainage Class:	well	somewhat excessively
Permeability Class:	rapid	very rapid
Depth to first restrictive layer (inches):	40	60
Electrical Conductivity (mmhos/cm)*:	0	2
Sodium Absorption Ratio*:	0	1
Soil Reaction (1:1 Water)*:	6.1	8.4
Soil Reaction (0.1M CaCl₂)*:	NA	NA
Available Water Capacity (inches)*:	2	4
Calcium Carbonate Equivalent (percent)*:	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 climatic conditions and/or management actions. Due to the nature of the soils, the site is considered moderately resilient. Under continued adverse impacts, a slow decline in vegetative vigor and composition will occur. Under favorable vegetative management treatments the site can readily return to the Historic Climax Plant Community (HCPC).

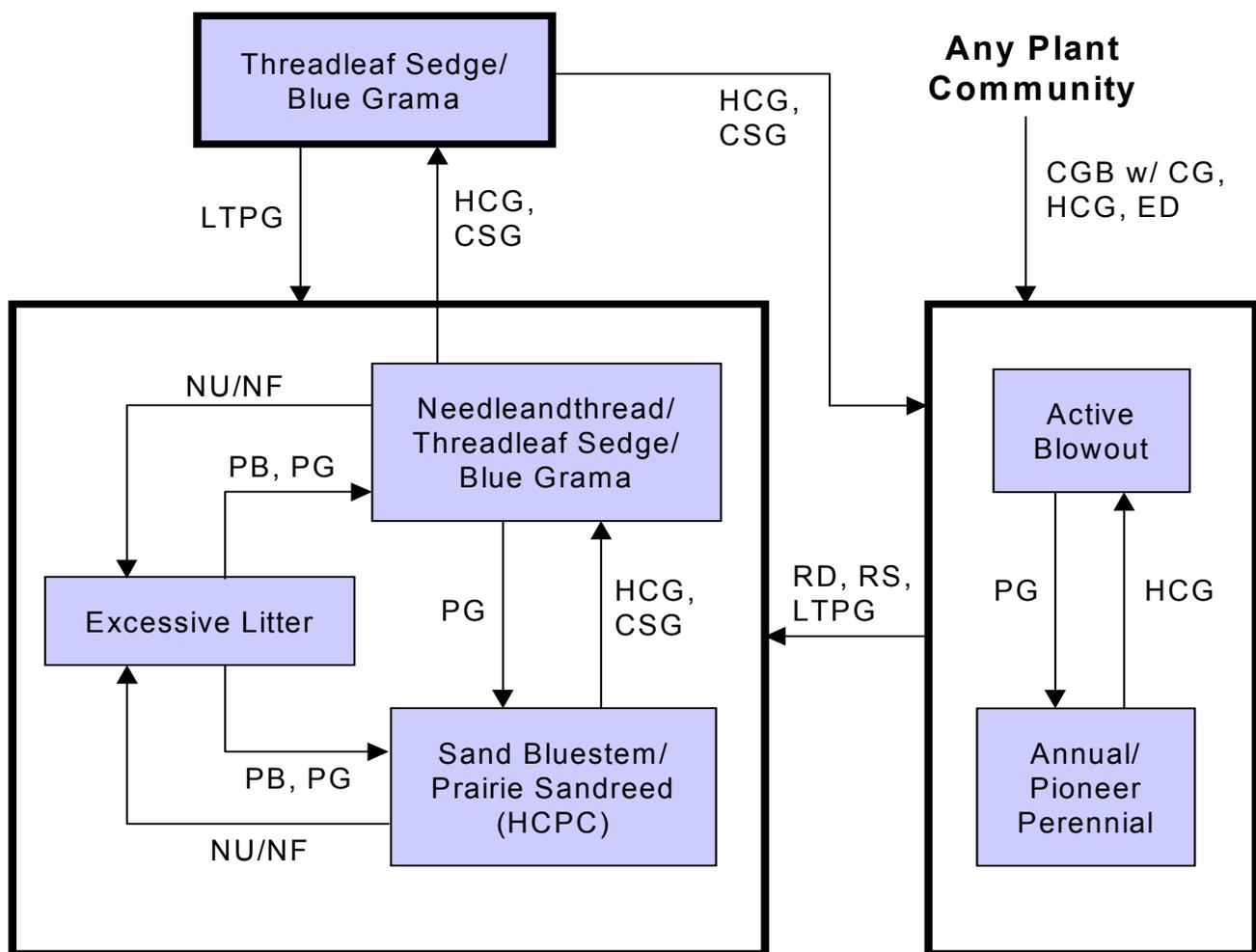
The plant community upon which interpretations are primarily based is the HCPC. The HCPC has been determined by study of rangeland relic areas, areas protected from excessive disturbance, and areas under long-term rotational grazing regimes. Trends in plant community dynamics ranging from heavily grazed to lightly grazed areas, seasonal use pastures, and historical accounts also have been considered. Subclimax plant communities, states, transitional pathways, and thresholds have been determined through similar studies and experience.

Heavy continuous grazing or continuous seasonal grazing, without adequate recovery opportunities following each grazing event during the growing season, will initially cause needleandthread, blue grama, and threadleaf sedge to increase. Species such as sand bluestem and prairie sandreed decrease in frequency and production. In time, heavy continuous grazing will likely cause blue grama and threadleaf sedge to dominate and other 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.

This site if heavily disturbed through improper grazing, wildfire, excessive defoliation or any type of physical disturbance can lead to serious erosion problems (blowout) on these fragile soils. Extended periods of non-use and/or lack of fire will result in a plant community having high litter levels, which favors an increase in Kentucky bluegrass and/or smooth brome grass. In time, shrubs such as yucca and cactus will likely become a major feature on this site.

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; **HCG** - heavy continuous grazing; **HCPC** - Historical Climax Plant Community; **LTPG** - long-term 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

COMMON/GROUP NAME	SYMBOL	Sand Bluestem/Prairie Sandreed (HCPC)			
		Group	lbs./acre	% Comp	
GRASSES & GRASS-LIKES			2000 - 2125	80 - 85	
BLUESTEM		1	375 - 625	15 - 25	
sand bluestem	ANHA	1	250 - 500	10 - 20	
little bluestem	SCSC	1	0 - 250	0 - 10	
OTHER NATIVE TALL GRASSES		2	250 - 500	10 - 20	
prairie sandreed	CALO	2	250 - 500	10 - 20	
NEEDLEGRASS		3	125 - 375	5 - 15	
needleandthread	HECOC8	3	125 - 375	5 - 15	
porcupine grass	HESP11	3	25 - 75	1 - 3	
GRAMA		4	50 - 125	2 - 5	
blue grama	BOGR2	4	50 - 125	2 - 5	
hairy grama	BOHI2	4	0 - 75	0 - 3	
OTHER NATIVE GRASSES		5	125 - 250	5 - 10	
Scribner panicum	DIOLS	5	0 - 25	0 - 1	
western wheatgrass	PASM	5	50 - 125	2 - 5	
sand dropseed	SPCR	5	0 - 25	0 - 1	
prairie junegrass	KOMA	5	25 - 50	1 - 2	
other perennial grasses	2GP	5	50 - 75	2 - 3	
GRASS-LIKES		6	125 - 250	5 - 10	
threadleaf sedge	CAFI	6	75 - 175	3 - 7	
sun sedge	CANH2	6	25 - 75	1 - 3	
other grass-likes	2GL	6	25 - 50	1 - 2	
FORBS		7	125 - 250	5 - 10	
American vetch	VIAM	7	0 - 25	0 - 1	
bracted spiderwort	TRBR	7	25 - 50	1 - 2	
erigonum	ERIOG	7	0 - 25	0 - 1	
false gromwell	ONMO	7	0 - 25	0 - 1	
gayfeather	LIATR	7	25 - 50	1 - 2	
goldenrod	SOLID	7	25 - 50	1 - 2	
green sagewort	ARDR4	7	50 - 75	2 - 3	
hairy goldaster	HEVI4	7	25 - 50	1 - 2	
Indian breadroot	PEES	7	0 - 25	0 - 1	
penstemon	PENST	7	25 - 50	1 - 2	
plains milkvetch	ASGI5	7	0 - 25	0 - 1	
prairie coneflower	RACO3	7	25 - 25	1 - 1	
purple coneflower	ECAN2	7	25 - 50	1 - 2	
rush skeletonweed	LYJU	7	25 - 25	1 - 1	
scurfpea	PSORA2	7	25 - 50	1 - 2	
silky prairie clover	DAVI	7	0 - 50	0 - 2	
stiff sunflower	HEPA19	7	25 - 50	1 - 2	
wavyleaf thistle	CIUN	7	0 - 25	0 - 1	
western ragweed	AMPS	7	25 - 25	1 - 1	
western wallflower	ERCAC	7	25 - 25	1 - 1	
other perennial forbs	2FP	7	0 - 25	0 - 1	
SHRUBS		8	50 - 125	2 - 5	
cactus	OPUNT	8	0 - 25	0 - 1	
creeping juniper	JUHO2	8	0 - 25	0 - 1	
dwarf false indigo	AMNA	8	0 - 25	0 - 1	
fringed sagewort	ARFR4	8	25 - 25	1 - 1	
leadplant	AMCA6	8	25 - 50	1 - 2	
rose	ROSA5	8	25 - 25	1 - 1	
shrubby cinquefoil	DAFL3	8	0 - 25	0 - 1	
yucca	YUGL	8	0 - 25	0 - 1	
other shrubs	2SHRUB	8	0 - 25	0 - 1	
Annual Production lbs./acre			LOW	RV	HIGH
GRASSES & GRASS-LIKES			1435 -	2225	-2995
FORBS			120 -	188	-275
SHRUBS			45 -	88	-130
TOTAL			1600 -	2500	-3400

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	Sand Bluestem/Prairie Sandreed (HCPC)			Needleandthread/Threadleaf Sedge/Blue Grama			Threadleaf Sedge/Blue Grama			Excessive Litter			
		Grp	lbs./acre	% Comp	Grp	lbs./acre	% Comp	Grp	lbs./acre	% Comp	Grp	lbs./acre	% Comp	
GRASSES & GRASS-LIKES			2125 - 2250	85 - 90		630 - 720	70 - 80		455 - 525	65 - 75		1760 - 1980	80 - 90	
BLUESTEM		1	375 - 625	15 - 25	1	0 - 18	0 - 2	1			1	66 - 154	3 - 7	
sand bluestem	ANHA	1	250 - 500	10 - 20							1	66 - 110	3 - 5	
little bluestem	SCBC	1	0 - 250	0 - 10	1	0 - 18	0 - 2				1	0 - 110	0 - 5	
OTHER NATIVE TALL GRASSES		2	250 - 500	10 - 20	2	0 - 45	0 - 5	2			2	44 - 110	2 - 5	
prairie sandreed	CALO	2	250 - 500	10 - 20	2	0 - 45	0 - 5				2	44 - 110	2 - 5	
NEEDLEGRASS		3	125 - 375	5 - 15	3	90 - 180	10 - 20	3	14 - 35	2 - 5	3	110 - 176	5 - 8	
needleandthread	HECOC8	3	125 - 375	5 - 15	3	90 - 180	10 - 20	3	14 - 35	2 - 5	3	110 - 176	5 - 8	
porcupine grass	HESP11	3	25 - 75	1 - 3							3	0 - 22	0 - 1	
GRAMA		4	50 - 125	2 - 5	4	63 - 108	7 - 12	4	70 - 105	10 - 15	4	22 - 66	1 - 3	
blue grama	BOGR2	4	50 - 125	2 - 5	4	63 - 108	7 - 12	4	70 - 105	10 - 15	4	22 - 44	1 - 2	
hairy grama	BOHI2	4	0 - 75	0 - 3	4	0 - 45	0 - 5	4	0 - 35	0 - 5	4	0 - 22	0 - 1	
OTHER NATIVE GRASSES		5	125 - 225	5 - 9	5	36 - 72	4 - 8	5	35 - 63	5 - 9	5	88 - 154	4 - 7	
Scribner panicum	DIOLS	5	0 - 25	0 - 1	5	9 - 18	1 - 2	5	7 - 21	1 - 3	5	0 - 22	0 - 1	
western wheatgrass	PASM	5	50 - 125	2 - 5	5	9 - 18	1 - 2	5	0 - 7	0 - 1	5	44 - 110	2 - 5	
sand dropseed	SPCR	5	0 - 25	0 - 1	5	18 - 27	2 - 3	5	14 - 28	2 - 4	5	22 - 44	1 - 2	
prairie junegrass	KOMA	5	25 - 50	1 - 2	5	9 - 18	1 - 2	5	0 - 7	0 - 1	5	22 - 44	1 - 2	
red threeawn	ARPUL				5	18 - 27	2 - 3	5	14 - 28	2 - 4	5	22 - 88	1 - 4	
other perennial grasses	ZGP	5	50 - 75	2 - 3	5	9 - 27	1 - 3	5	7 - 21	1 - 3	5	44 - 66	2 - 3	
GRASS-LIKES		6	125 - 250	5 - 10	6	135 - 180	15 - 20	6	140 - 210	20 - 30	6	88 - 176	4 - 8	
threadleaf sedge	CAFI	6	75 - 175	3 - 7	6	90 - 180	10 - 20	6	140 - 210	20 - 30	6	66 - 154	3 - 7	
sun sedge	CAINH2	6	25 - 75	1 - 3	6	18 - 27	2 - 3	6	14 - 35	2 - 5	6	44 - 66	2 - 3	
other grass-like	ZGL	6	25 - 50	1 - 2	6	9 - 18	1 - 2	6	21 - 35	3 - 5	6	22 - 44	1 - 2	
NON-NATIVE GRASSES		7			7	9 - 27	1 - 3	7	0 - 7	0 - 1	7	550 - 990	25 - 45	
smooth bromegrass	BRIN2				7	0 - 18	0 - 2				7	0 - 880	0 - 40	
cheatgrass	BRTE				7	0 - 18	0 - 2	7	0 - 7	0 - 1	7	0 - 220	0 - 10	
Kentucky bluegrass	POPR										7	220 - 880	10 - 40	
crested wheatgrass	AGCR				7	0 - 9	0 - 1				7	0 - 330	0 - 15	
FORBS		8	125 - 250	5 - 10	8	135 - 180	15 - 20	8	105 - 140	15 - 20	8	110 - 220	5 - 10	
American vetch	VIAM	8	0 - 25	0 - 1							8	0 - 22	0 - 1	
bracted spiderwort	TRBR	8	25 - 50	1 - 2							8	0 - 22	0 - 1	
erigonum	ERIOG	8	0 - 25	0 - 1	8	0 - 18	0 - 2	8	0 - 21	0 - 3	8	0 - 22	0 - 1	
false gromwell	ONMO	8	0 - 25	0 - 1							8	0 - 22	0 - 1	
gayfeather	LIATR	8	25 - 50	1 - 2	8	9 - 18	1 - 2	8	0 - 7	0 - 1	8	0 - 22	0 - 1	
goldenrod	SOLID	8	25 - 50	1 - 2	8	9 - 27	1 - 3	8	0 - 7	0 - 1	8	22 - 44	1 - 2	
green sagewort	ARDR4	8	50 - 75	2 - 3	8	45 - 90	5 - 10	8	35 - 105	5 - 15	8	44 - 66	2 - 3	
hairy goldaster	HEVI4	8	25 - 50	1 - 2	8	27 - 45	3 - 5	8	28 - 49	4 - 7	8	22 - 44	1 - 2	
Hood's phlox	PHHO				8	9 - 9	1 - 1	8	7 - 14	1 - 2				
Indian breadroot	PEES	8	0 - 25	0 - 1							8	22 - 22	1 - 1	
penstemon	PENST	8	25 - 50	1 - 2							8	0 - 22	0 - 1	
plains milkvetch	ASGI5	8	0 - 25	0 - 1							8	0 - 22	0 - 1	
prairie coneflower	RACO3	8	25 - 25	1 - 1	8	9 - 18	1 - 2	8	14 - 21	2 - 3	8	22 - 44	1 - 2	
purple coneflower	ECAN2	8	25 - 50	1 - 2	8	0 - 9	0 - 1				8	22 - 44	1 - 2	
rush skeletonweed	LYJU	8	25 - 25	1 - 1	8	9 - 18	1 - 2	8	7 - 14	1 - 2	8	22 - 22	1 - 1	
scurfpea	PSORA2	8	25 - 50	1 - 2	8	27 - 45	3 - 5	8	28 - 49	4 - 7	8	22 - 44	1 - 2	
silky prairie clover	DAVI	8	0 - 50	0 - 2							8	0 - 22	0 - 1	
stiff sunflower	HEPA19	8	25 - 50	1 - 2							8	22 - 22	1 - 1	
sweetclover	MELIL				8	0 - 90	0 - 10	8	0 - 70	0 - 10	8	0 - 220	0 - 10	
wayleaf thistle	CIUN	8	0 - 25	0 - 1	8	18 - 27	2 - 3	8	14 - 28	2 - 4	8	22 - 44	1 - 2	
western ragweed	AMPS	8	25 - 25	1 - 1	8	18 - 27	2 - 3	8	14 - 28	2 - 4	8	22 - 44	1 - 2	
western wallflower	ERCAC	8	25 - 25	1 - 1	8	9 - 18	1 - 2	8	7 - 21	1 - 3	8	22 - 22	1 - 1	
woolly Indianwheat	PLPA2				8	9 - 9	1 - 1	8	7 - 14	1 - 2				
other perennial forbs	ZFP	8	0 - 25	0 - 1	8	9 - 18	1 - 2	8	7 - 14	1 - 2	8	22 - 22	1 - 1	
other annual forbs	ZFA				8	9 - 9	1 - 1	8	7 - 7	1 - 1	8	22 - 22	1 - 1	
SHRUBS		9	50 - 125	2 - 5	9	45 - 72	5 - 8	9	35 - 105	5 - 15	9	66 - 132	3 - 6	
cactus	OPUNT	9	0 - 25	0 - 1	9	18 - 27	2 - 3	9	21 - 35	3 - 5	9	0 - 22	0 - 1	
creeping juniper	JUHO2	9	0 - 25	0 - 1	9	9 - 18	1 - 2	9	14 - 21	2 - 3	9	0 - 22	0 - 1	
dwarf false indigo	AMNA	9	0 - 25	0 - 1							9	0 - 22	0 - 1	
fringed sagewort	ARFR4	9	25 - 25	1 - 1	9	27 - 54	3 - 6	9	35 - 70	5 - 10	9	44 - 88	2 - 4	
leadplant	AMCA6	9	25 - 50	1 - 2							9	0 - 44	0 - 2	
rose	ROSA5	9	25 - 25	1 - 1	9	9 - 18	1 - 2	9	7 - 7	1 - 1	9	22 - 44	1 - 2	
shrubby cinquefoil	DAFL3	9	0 - 25	0 - 1							9	0 - 22	0 - 1	
yucca	YUGL	9	0 - 25	0 - 1	9	9 - 27	1 - 3	9	14 - 28	2 - 4	9	22 - 22	1 - 1	
other shrubs	ZSHRUB	9	0 - 25	0 - 1	9	0 - 9	0 - 1	9	0 - 7	0 - 1	9	22 - 44	1 - 2	
CRYPTOGAMS		10	0 - 25	0 - 1	10	9 - 18	1 - 2	10	21 - 35	3 - 5	10	0 - 22	0 - 1	
clubmoss	SEDE2	10			10			10			10			
Annual Production lbs./acre			LOW	RV	HIGH	LOW	RV	HIGH	LOW	RV	HIGH	LOW	RV	HIGH
GRASSES & GRASS-LIKES			1435	2225	2995	330	684	840	270	508	645	1230	1936	2840
FORBS			120	188	275	130	158	185	100	123	145	105	165	225
SHRUBS			45	88	130	40	59	75	30	70	110	65	99	135
CRYPTOGAMS														
TOTAL			1600	2500	3400	500	900	1100	400	700	900	1400	2200	3200

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.

Plar

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.

Sand Bluestem/Prairie Sandreed 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. The plant community is dominated by sand bluestem and prairie sandreed. Other grasses and grass-like plants occurring include needleandthread, blue grama, western wheatgrass, threadleaf, and sun sedge. Significant forbs include penstemon, green sagewort, silverleaf scurfpea, and spiderwort. Leadplant, rose, and yucca are the principal shrubs.

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 very little movement offsite and natural plant mortality is very low. The diversity in plant species allows for high drought tolerance. This is a sustainable plant community in terms of 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 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 and/or continuous seasonal (spring) grazing will convert the plant community to the *Needleandthread/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* or *Active Blowout*.
- Cropped go-back land with continuous grazing will convert this plant community to the *Annual/Pioneer Perennial Plant Community* or *Active Blowout*.

Needleandthread/Threadleaf Sedge/Blue Grama Plant Community

This plant community is the result of long-term, heavy continuous grazing and/or continuous seasonal (spring) grazing. Sand bluestem has been removed and prairie sandreed has been greatly reduced. Threadleaf sedge, blue grama, and needleandthread have increased and are the dominant species. Other grasses include western wheatgrass, red threeawn, sand dropseed, and prairie junegrass. Forbs such as western ragweed, green sagewort, hairy goldaster, cudweed sagewort, scarlet globemallow, and sweet clover may also be present. Fringed sagewort and cactus have also increased.

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 scoured areas may exist where cover has been reduced or eliminated.

The following growth curve is an estimate of the monthly percentages of total annual growth of the dominant species expected during a normal year.

Growth curve number: ND5411

Growth curve name: Missouri Slope, Needlegrass, and Sedge.

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

JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
0	0	3	9	27	35	15	4	5	2	0	0

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

- Heavy, continuous grazing and/or continuous seasonal (spring) grazing will cause further deterioration resulting in a shift to the *Threadleaf Sedge/Blue Grama Sod Plant Community*.
- Non-use and no fire over an extended period of time will shift this plant community to the *Excessive Litter Plant Community*.
- Prescribed grazing that includes changing season of use and allowing adequate recovery periods between grazing events, will move this plant community back to the *Sand Bluestem/Prairie Sandreed Plant Community (HCPC)*.
- Excessive defoliation (i.e., areas of heavy animal concentration,) will convert the plant community to the *Annual/Pioneer Perennial Plant Community* or *Active Blowout*.
- Cropped go-back land with continuous grazing will convert this plant community to the *Annual/Pioneer Perennial Plant Community* or *Active Blowout*.

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 may include sand bluestem, prairie sandreed, little bluestem, western wheatgrass, and prairie junegrass. The common forbs include green sagewort, goldenrod, western wallflower, western ragweed, and sweetclover. Fringed sagewort and prairie rose are the principal shrubs.

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 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 is an estimate of the 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 and/or prescribed burning will move this plant community toward the *Sand Bluestem/Prairie Sandreed Plant Community (HCPC)* or the *Needleandthread/Threadleaf Sedge/Blue Grama Plant Community*. This would require long-term management with prescribed grazing and/or prescribed burning under favorable climatic conditions.
- Excessive defoliation (i.e., areas of heavy animal concentration,) will convert the plant community to the *Annual/Pioneer Perennial Plant Community* or *Active Blowout*.
- Cropped go-back land with continuous grazing will convert this plant community to the *Annual/Pioneer Perennial Plant Community* or *Active Blowout*.

Threadleaf Sedge/Blue Grama Plant Community

This plant community developed from heavy continuous grazing without adequate recovery periods between grazing events or continuous seasonal (spring) grazing. Threadleaf sedge and blue grama dominate this plant community. Blue grama has developed into a sod condition. Sand bluestem and prairie sandreed have been removed. Other grasses and grass-likes present include sand dropseed, red threeawn, needleandthread, prairie junegrass, and sun sedge. Forbs commonly found in this plant community include green sagewort, silverleaf scurfpea, and hairy goldaster.

Lack of litter and reduced plant vigor result in higher soil temperatures, poor water infiltration rates, and high evapotranspiration, which gives blue grama a competitive advantage over cool-season mid grasses. The competitive nature of the dominant species prevents other species from establishing. This plant community is less productive than the HCPC. Soil loss due to water erosion will be minimal, but wind erosion remains a concern.

The following growth curve represents monthly percentages of total annual growth of the dominant species 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:

- Excessive defoliation (i.e., areas of heavy animal concentration,) will convert the plant community to the *Annual/Pioneer Perennial Plant Community* or *Active Blowout*.

- Cropped go-back land with continuous grazing will convert this plant community to the *Annual/Pioneer Perennial Plant Community* or *Active Blowout*.
- Long-term prescribed grazing with adequate recovery periods following each grazing event may move this plant community toward the *Needleandthread/Threadleaf Sedge/Blue Grama Plant Community*, and 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, sand dropseed, sandbur, and Scribner's Panicum. 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 sagewort, 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 non-native species due to severe soil disturbances and relatively high percent of bare ground. Many annual and perennial forbs, including non-native 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. 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:

- Heavy, continuous grazing and/or excessive defoliation will cause this plant community to move toward an *Active Blowout*.
- Removal of disturbance followed by long-term prescribed grazing, including adequate rest periods, will move this community through the successional stages, and may eventually lead to the *Sand Bluestem/Prairie Sandreed Plant Community (HCPC)* or associated successional plant communities assuming an adequate seed/vegetative source exists. This process will likely take a long period of time (25+ years).
- Range seeding followed by long-term prescribed grazing can be used to convert this plant community to one that may resemble the *HCPC*.

Active Blowout

Heavy continuous grazing, excessive defoliation, disturbance (tillage, etc.,) and/or wildfire brings about this condition. Continuous grazing will only increase the size of the blowouts. This condition is not stable. It consists of bare areas that are continually eroded by wind.

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

- Removal of disturbance followed by range seeding, which can include mulching, followed by prescribed grazing can be used to convert this plant community to one that may resemble the *HCPC*.

Ecological Site Interpretations

Animal Community – Wildlife Interpretations

-- Under Development --

Prairie Sandreed/Bluestem Plant Community:

Needleandthread/Threadleaf Sedge/Blue Grama Plant Community:

Excessive Litter Plant Community:

Threadleaf Sedge/Blue Grama Plant Community:

Annual/Pioneer Perennial Plant Community:

Active Blowout:

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

Common Name	Cattle	Sheep	Horses	Deer	Antelope	Bison	Elk
Grasses & Grass-like							
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
cheatgrass	U D U U	N P U N	U D U U	N P U N	N P U 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
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
Kentucky bluegrass	U D U U	U P N D	U D U U	U P N D	U P N D	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
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
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
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
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
sun 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
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
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
Forbs							
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
bracted 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
eriogonum	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
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
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
Indian breadroot	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 U
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
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
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
silky 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
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 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 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
Shrubs							
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
creeping juniper	U N N U	U N N U	U N N U	U N N U	U N N U	U N N U	U N N U
dwarf false indigo	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
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
shrubby cinquefoil	N N U N	N U D U	N N U N	N U D U	N U D U	N N U N	N U D 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

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 ¹ (AUM/acre)
Sand Bluestem/Prairie Sandreed (HCPC)	2500	0.79
Excessive Litter	2200	0.69 ²
Needleandthread/Threadleaf Sedge/Blue Grama	900	0.28
Threadleaf Sedge/Blue Grama Sod	700	0.22
Annual/Pioneer Perennial	-- ³	-- ³

¹ Continuous season-long grazing by cattle under average growing conditions.

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

³ Highly variable; stocking rate needs to be determined on site.

Hydrology Functions

Water is the principal factor limiting herbage production on this site. The site is dominated by soils in hydrologic groups A and B. Infiltration varies from very rapid to rapid and runoff potential varies from negligible to low 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. 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 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

- | | |
|------------------------------|------------------------------|
| (054XY026ND) – Sandy | (054XY043ND) – Shallow Sandy |
| (054XY027ND) – Sandy Claypan | (054XY034ND) – Thin Sands |
| (054XY042ND) – Sandy Terrace | (054XY045ND) – Limy Sands |

Similar Sites

- (054XY026ND) – Sandy (Sy)

[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, sands, clayey sites; will ribbon up to one inch. Indicator species are prairie sandreed with western wheatgrass and green needlegrass intermixed. This site has less sand bluestem, needleandthread and sedges, more blue grama, green needlegrass and western wheatgrass, slightly less production, similar landscape position.]

- (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, more big bluestem, green needlegrass, blue grama, less needleandthread, and sedges.]

- (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, more little bluestem, blue grama, and more sedges, restrictive layer within 20 inches.]

(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 far less production, thin "A" horizon, no mollic epipedon, more needleandthread, choppier landscape.]

(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 sand reed, 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; 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; 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	4	1978 – 1979	ND	Adams
Ocular Estimates	7	1984 – 2001	ND	Dunn, Grant, Morton

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
Bison, SD	Dickinson, ND	Mandan, ND	Watford City, ND
Bowman, ND	Dupree, SD	McIntosh, SD	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>).

Site Type: Rangeland
MLRA: 54 – Rolling Soft Shale Plain

Sands
R054XY025ND

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

USDA, NRCS. National Range and Pasture Handbook, September 1997

USDA, NRCS. National Soil Information System, Information Technology Center, 2150 Centre Avenue, Building A, Fort Collins, CO 80526. (<http://nasis.nrcs.usda.gov>).

USDA, NRCS. 2001. The PLANTS Database, Version 3.1 (<http://plants.usda.gov>). National Plant Data Center, Baton Rouge, LA 70874-4490 USA.

USDA, NRCS, Various Published Soil Surveys.

Site Description Approval

State Range Management Specialist

Date

State Range Management Specialist

Date

State Range Management Specialist

Date