

**United States Department of Agriculture
Natural Resources Conservation Service**

Ecological Site Description

Site Type: Rangeland

Site Name: Thin Upland

Site ID: R060AY012SD

Major Land Resource Area: 60A – Pierre Shale Plains



Physiographic Features

This site occurs on gently sloping to very steep uplands.

Landform: hill, ridge, knoll

Aspect: N/A

	<u>Minimum</u>	<u>Maximum</u>
Elevation (feet):	2500	4300
Slope (percent):	2	45
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:	Medium	Very high

Climatic Features

The climate in this MLRA is typical of the drier portions of the Northern Great Plains where sagebrush steppes to the west yield to grassland steppes to the east. Annual precipitation ranges from 13 to 18 inches per year, with most occurring during the growing season. Temperatures show a wide range between summer and winter and between daily maximums and minimums, due to the high elevation and dry air, which permits rapid incoming and outgoing radiation. Cold air outbreaks from Canada in winter move rapidly from northwest to southeast and account for extreme minimum temperatures. Chinook winds may occur in winter and bring rapid rises in temperature. Extreme storms may occur during the winter, but most severely affect ranch operations during late winter and spring. The normal average annual temperature is about 46° F. January is the coldest month with average temperatures ranging from about 19° F (Moorcroft CAA, WY) to about 22° F (Belle Fourche, SD). July is the warmest month with temperatures averaging from about 70° F (Moorcroft CAA, WY) to about 72° F (Belle Fourche, SD). The range of normal average monthly temperatures between the coldest and warmest months is about 51° F. 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.

RANGELAND INTERPRETATIONS

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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 can continue to early or mid September. Green up of cool season plants may occur in September and October when adequate soil moisture is present.

	<u>Minimum</u>	<u>Maximum</u>
Frost-free period (days):	122	129
Freeze-free period (days):	145	152
Mean Annual Precipitation (inches):	13	18

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

	Precip. Min.	Precip. Max	Temp. Min.	Temp. Max.
January	0.32	0.43	7.1	34.1
February	0.44	0.57	12.6	40.1
March	0.65	0.94	19.7	46.5
April	1.43	1.72	29.4	60.2
May	2.45	3.19	39.7	70.6
June	2.34	3.38	48.5	80.1
July	1.60	2.78	54.8	88.0
August	1.24	1.76	53.1	87.7
September	1.01	1.50	42.3	77.0
October	0.90	1.11	31.4	64.9
November	0.40	0.61	19.8	47.5
December	0.40	0.48	10.2	38.0

Climate Stations		Period	
Station ID	Location or Name	From	To
SD0236	Ardmore 2 N	1948	1999
SD0559	Belle Fourche	1948	1999
SD1124	Buffalo Gap	1951	1999
WY6395	Moorcroft CAA	1948	1998
WY9207	Upton 13 SW	1949	1998

For other 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 soils in this site are well drained and formed in soft siltstone, sandstone or loess deposits. The loam to silty clay loam surface layer is 4 to 7 inches thick. The soils have a moderate to moderately slow infiltration rate. These soils are typically calcareous at or near the surface; however, carbonates are not always distinguishable in the upper layers. The soil profile should show evidence of weak development (i.e., thin A horizon, pale colors, lack of argillic horizon). This site should show slight to no evidence of rills or wind scoured areas. It is not uncommon to have some pedestalling of plants due to the inherent instability of the soils. Water flow paths are broken, irregular in appearance or discontinuous with numerous debris dams or vegetative barriers. The soil surface is stable and intact. Sub-surface soil layers are slightly restrictive to water movement and root penetration.

These soils are highly susceptible to water erosion and to a lesser degree wind erosion. The hazard of water erosion increases where vegetative cover is not adequate. More information can be found in the various soil survey reports. Contact the local USDA Service Center for soil survey reports that include more detail specific to your location.

Parent Material Kind: sedimentary
Parent Material Origin: mixed
Surface Texture: silt loam, silty clay loam, clay loam, loam
Surface Texture Modifier: none
Subsurface Texture Group: loamy
Surface Fragments $\leq 3''$ (% Cover): 0
Surface Fragments $> 3''$ (%Cover): 0
Subsurface Fragments $\leq 3''$ (% Volume): 0-20
Subsurface Fragments $> 3''$ (% Volume): 0-10

	<u>Minimum</u>	<u>Maximum</u>
Drainage Class:	well	well
Permeability Class:	slow	moderate
Depth (inches):	20	80
Electrical Conductivity (mmhos/cm)*:	0	8
Sodium Absorption Ratio*:	0	4
Soil Reaction (1:1 Water)*:	6.6	8.4
Soil Reaction (0.1M CaCl₂)*:	NA	NA
Available Water Capacity (inches)*:	5	6
Calcium Carbonate Equivalent (percent)*:	0	30

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

Plant Communities

Ecological Dynamics of the Site:

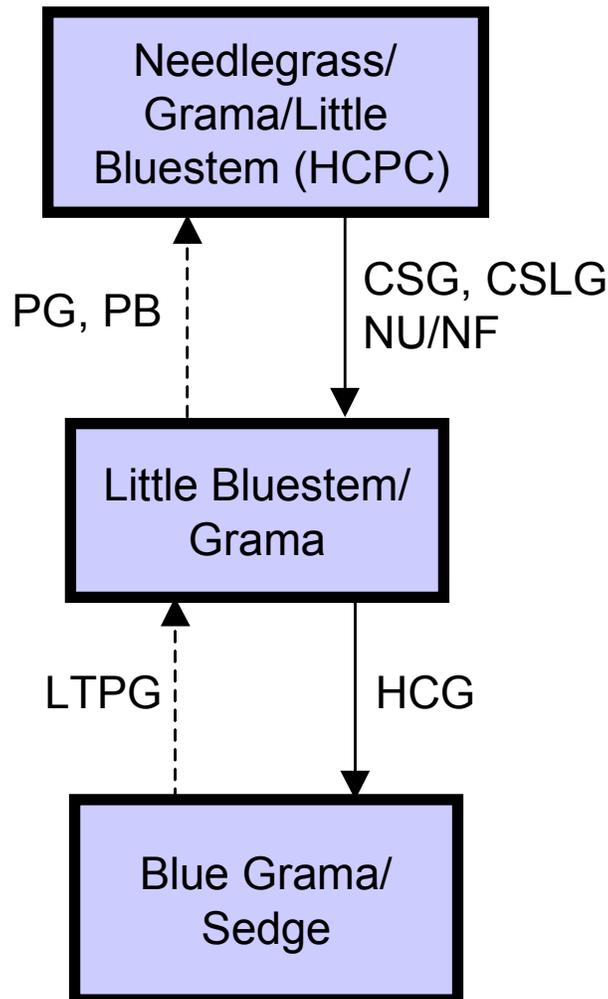
This site developed under Northern Great Plains climatic conditions, natural influences of large herbivores, occasional fire, and other biotic and abiotic factors that typically influence soil/site development. Changes will occur in the plant communities due to short-term weather variations, impacts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

Encroachment of ponderosa pine, Rocky Mountain juniper and eastern redcedar may occur from associated sites, and can shift site characteristics. These shifts can alter the site dynamics and potential. These species may occur in small amounts on several plant communities.

The plant community upon which interpretations are primarily based is the Historic Climax Plant Community (HCPC). The HCPC has been determined by studying 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 communities, states, transitional pathways, and thresholds have been determined through similar studies and experience.

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 are discussed in more detail in the plant community descriptions following the diagram.

Plant Communities and Transitional Pathways



- CSG** - continuous seasonal grazing;
- CSLG** - continuous season-long grazing;
- 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 followed by prescribed grazing;
- PG** - prescribed grazing.

Plant Community Composition and Group Annual Production

COMMON/GROUP NAME	SCIENTIFIC NAME	SYMBOL	Needlegrass/Grama/ Little Bluestem (HCPC)		
			Group	lbs./acre	% Comp
GRASSES & GRASS-LIKES				1050 - 1190	75 - 85
little bluestem	Schizachyrium scoparium	SCSC	1	140 - 490	10 - 35
sideoats grama	Bouteloua curtipendula	BOCU	2	70 - 280	5 - 20
NEEDLEGRASS			3	140 - 210	10 - 15
needleandthread	Hesperostipa comata ssp. comata	HECOC8	3	140 - 210	10 - 15
porcupine grass	Hesperostipa spartea	HESP11	3	0 - 70	0 - 5
green needlegrass	Nassella viridula	NAVI4	3	0 - 70	0 - 5
SHORT WARM-SEASON GRASSES			4	140 - 280	10 - 20
blue grama	Bouteloua gracilis	BOGR2	4	140 - 280	10 - 20
hairy grama	Bouteloua hirsuta	BOHI2	4	0 - 70	0 - 5
buffalograss	Buchloe dactyloides	BUDA	4	0 - 70	0 - 5
NATIVE GRASSES & GRASS-LIKES			5	140 - 350	10 - 25
sedge	Carex spp.	CAREX	5	70 - 140	5 - 10
big bluestem	Andropogon gerardii	ANGE	5	0 - 140	0 - 10
prairie sandreed	Calamovilfa longifolia	CALO	5	0 - 70	0 - 5
prairie junegrass	Koeleria macrantha	KOMA	5	14 - 70	1 - 5
western wheatgrass	Pascopyrum smithii	PASM	5	70 - 210	5 - 15
Sandberg bluegrass	Poa secunda	POSE	5	0 - 42	0 - 3
plains muhly	Muhlenbergia cuspidata	MUCU3	5	0 - 70	0 - 5
other perennial grasses		2GP	5	0 - 70	0 - 5
FORBS			7	70 - 210	5 - 15
cudweed sagewort	Artemisia ludoviciana	ARLU	7	14 - 56	1 - 4
dalea	Dalea spp.	DALEA	7	14 - 70	1 - 5
dotted gayfeather	Liatris punctata	LIPU	7	28 - 70	2 - 5
false boneset	Brickellia eupatorioides	BREU	7	0 - 70	0 - 5
goldenrod	Solidago spp.	SOLID	7	0 - 28	0 - 2
green sagewort	Artemisia dracunculus	ARDR4	7	0 - 70	0 - 5
hairy goldaster	Heterotheca villosa	HEVI4	7	0 - 28	0 - 2
heath aster	Symphotrichum ericoides	SYER	7	0 - 28	0 - 2
Indian breadroot	Pediomelum esculentum	PEES	7	0 - 28	0 - 2
milkvetch	Astragalus spp.	ASTRA	7	14 - 70	1 - 5
miner's candle	Cryptantha celosioides	CRCE	7	0 - 28	0 - 2
penstemon	Penstemon spp.	PENST	7	0 - 28	0 - 2
purple coneflower	Echinacea angustifolia	ECAN2	7	28 - 140	2 - 10
purple prairie clover	Dalea purpurea	DAPU5	7	0 - 42	0 - 3
pussytoes	Antennaria spp.	ANTEN	7	0 - 28	0 - 2
scarlet gaura	Gaura coccinea	GACO5	7	14 - 42	1 - 3
scarlet globemallow	Sphaeralcea coccinea	SPCO	7	14 - 70	1 - 5
scurfspea	Psoralidium spp.	PSORA2	7	0 - 28	0 - 2
sego lily	Calochortus nuttallii	CANU3	7	0 - 14	0 - 1
spiny phlox	Phlox hoodii	PHHO	7	0 - 28	0 - 2
western ragweed	Ambrosia psilostachya	AMPS	7	14 - 70	1 - 5
other perennial forbs		2FP	7	0 - 42	0 - 3
SHRUBS			8	70 - 140	5 - 10
catclaw sensitive briar	Mimosa nuttallii	MINU6	8	0 - 14	0 - 1
dwarf false indigo	Amorpha nana	AMNA	8	0 - 28	0 - 2
fringed sagewort	Artemisia frigida	ARFR4	8	28 - 70	2 - 5
leadplant	Amorpha canescens	AMCA6	8	0 - 70	0 - 5
rose	Rosa spp.	ROSA5	8	0 - 70	0 - 5
skunkbush sumac	Rhus trilobata	RHTR	8	0 - 28	0 - 2
yucca	Yucca glauca	YUGL	8	0 - 70	0 - 5
other shrubs		2SHRUB	8	0 - 42	0 - 3

Annual Production lbs./acre	LOW	RV	HIGH
GRASSES & GRASS-LIKES	870 -	1155	-1540
FORBS	65 -	140	-215
SHRUBS	65 -	105	-145
TOTAL	1000 -	1400	-1900

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	Needlegrass/Grama/ Little Bluestem (HCPC)			Little Bluestem/Grama			Blue Grama/Sedge			
		Grp	lbs./acre	% Comp	Grp	lbs./acre	% Comp	Grp	lbs./acre	% Comp	
GRASSES & GRASS-LIKES			1050 - 1190	75 - 85		960 - 1080	80 - 90		600 - 680	75 - 85	
little bluestem	SCSC	1	140 - 490	10 - 35	1	420 - 720	35 - 60	1	40 - 80	5 - 10	
sideoats grama	BOCU	2	70 - 280	5 - 20	2	60 - 180	5 - 15	2	8 - 40	1 - 5	
NEEDLEGRASS		3	140 - 210	10 - 15	3	12 - 60	1 - 5	3	8 - 40	1 - 5	
needleandthread	HECOC8	3	140 - 210	10 - 15	3	12 - 60	1 - 5	3	8 - 16	1 - 2	
porcupine grass	HESP11	3	0 - 70	0 - 5	3	0 - 12	0 - 1	3	0 - 8	0 - 1	
green needlegrass	NAVI4	3	0 - 70	0 - 5	3	0 - 12	0 - 1	3	0 - 8	0 - 1	
SHORT WARM-SEASON GRASSES		4	140 - 280	10 - 20	4	240 - 420	20 - 35	4	200 - 320	25 - 40	
blue grama	BOGR2	4	140 - 280	10 - 20	4	180 - 360	15 - 30	4	160 - 320	20 - 40	
hairy grama	BOHI2	4	0 - 70	0 - 5	4	0 - 120	0 - 10	4	0 - 80	0 - 10	
buffalograss	BUDA	4	0 - 70	0 - 5	4	0 - 120	0 - 10	4	0 - 80	0 - 10	
NATIVE GRASSES/GRASS-LIKES		5	140 - 350	10 - 25	5	180 - 300	15 - 25	5	160 - 240	20 - 30	
sedge	CAREX	5	70 - 140	5 - 10	5	120 - 180	10 - 15	5	120 - 200	15 - 25	
big bluestem	ANGE	5	0 - 140	0 - 10	5	0 - 60	0 - 5				
prairie sandreed	CALO	5	0 - 70	0 - 5	5	0 - 96	0 - 8	5	0 - 16	0 - 2	
prairie junegrass	KOMA	5	14 - 70	1 - 5	5	12 - 60	1 - 5	5	8 - 40	1 - 5	
western wheatgrass	PASM	5	70 - 210	5 - 15	5	24 - 120	2 - 10	5	8 - 16	1 - 2	
Sandberg bluegrass	POSE	5	0 - 42	0 - 3	5	0 - 36	0 - 3	5	0 - 8	0 - 1	
plains muhly	MUCU3	5	0 - 70	0 - 5	5	12 - 36	1 - 3	5	16 - 40	2 - 5	
threeawn	ARIST				5	0 - 36	0 - 3	5	0 - 40	0 - 5	
other perennial grasses	2GP	5	0 - 70	0 - 5	5	0 - 60	0 - 5	5	0 - 40	0 - 5	
NON-NATIVE GRASSES		6			6			6	0 - 40	0 - 5	
cheatgrass	BRTE							6	0 - 40	0 - 5	
FORBS		7	70 - 210	5 - 15	7	60 - 120	5 - 10	7	40 - 120	5 - 15	
cudweed sagewort	ARLU	7	14 - 56	1 - 4	7	24 - 72	2 - 6	7	16 - 40	2 - 5	
curlycup gumweed	GRSQ				7	0 - 24	0 - 2	7	0 - 40	0 - 5	
dalea	DALEA	7	14 - 70	1 - 5	7	12 - 60	1 - 5	7	8 - 16	1 - 2	
dotted gayfeather	LIPU	7	28 - 70	2 - 5	7	12 - 36	1 - 3	7	8 - 16	1 - 2	
false boneset	BREU	7	0 - 70	0 - 5	7	0 - 60	0 - 5	7	0 - 24	0 - 3	
goldenrod	SOLID	7	0 - 28	0 - 2	7	0 - 36	0 - 3	7	0 - 16	0 - 2	
green sagewort	ARDR4	7	0 - 70	0 - 5	7	0 - 60	0 - 5	7	8 - 40	1 - 5	
hairy goldaster	HEVI4	7	0 - 28	0 - 2	7	0 - 36	0 - 3	7	0 - 8	0 - 1	
heath aster	SYER	7	0 - 28	0 - 2	7	12 - 36	1 - 3	7	16 - 40	2 - 5	
Indian breadroot	PEES	7	0 - 28	0 - 2	7	0 - 12	0 - 1				
milkvetch	ASTRA	7	14 - 70	1 - 5	7	12 - 60	1 - 5	7	16 - 40	2 - 5	
miner's candle	CRCE	7	0 - 28	0 - 2	7	0 - 24	0 - 2	7	0 - 16	0 - 2	
penstemon	PENST	7	0 - 28	0 - 2	7	0 - 12	0 - 1				
purple coneflower	ECAN2	7	28 - 140	2 - 10	7	12 - 60	1 - 5	7	16 - 80	2 - 10	
purple prairie clover	DAPU5	7	0 - 42	0 - 3	7	0 - 36	0 - 3	7	0 - 8	0 - 1	
pussytoes	ANTEN	7	0 - 28	0 - 2	7	0 - 24	0 - 2	7	0 - 40	0 - 5	
scarlet gaura	GACO5	7	14 - 42	1 - 3	7	12 - 36	1 - 3	7	8 - 40	1 - 5	
scarlet globemallow	SPCO	7	14 - 70	1 - 5	7	12 - 60	1 - 5	7	8 - 40	1 - 5	
scurfpea	PSORA2	7	0 - 28	0 - 2	7	0 - 36	0 - 3	7	0 - 16	0 - 2	
sego lily	CANU3	7	0 - 14	0 - 1							
spiny phlox	PHHO	7	0 - 28	0 - 2	7	0 - 24	0 - 2	7	8 - 24	1 - 3	
sweetclover	MELIL				7	0 - 96	0 - 8	7	0 - 80	0 - 10	
western ragweed	AMPS	7	14 - 70	1 - 5	7	12 - 60	1 - 5	7	16 - 48	2 - 6	
western salsify	TRDU				7	0 - 36	0 - 3	7	0 - 32	0 - 4	
other perennial forbs	2FP	7	0 - 42	0 - 3	7	0 - 36	0 - 3	7	0 - 24	0 - 3	
SHRUBS		8	70 - 140	5 - 10	8	60 - 120	5 - 10	8	40 - 80	5 - 10	
catclaw sensitive briar	MINU6	8	0 - 14	0 - 1							
dwarf false indigo	AMNA	8	0 - 28	0 - 2	8	0 - 12	0 - 1	8	0 - 8	0 - 1	
fringed sagewort	ARFR4	8	28 - 70	2 - 5	8	36 - 96	3 - 8	8	40 - 80	5 - 10	
leadplant	AMCA6	8	0 - 70	0 - 5	8	0 - 24	0 - 2	8	0 - 16	0 - 2	
rose	ROSA5	8	0 - 70	0 - 5	8	0 - 60	0 - 5	8	0 - 16	0 - 2	
skunkbush sumac	RHTR	8	0 - 28	0 - 2	8	0 - 24	0 - 2	8	0 - 16	0 - 2	
yucca	YUGL	8	0 - 70	0 - 5	8	0 - 60	0 - 5	8	0 - 64	0 - 8	
other shrubs	2SHRUB	8	0 - 42	0 - 3	8	0 - 36	0 - 3	8	0 - 24	0 - 3	
Annual Production lbs./acre			LOW	RV	HIGH	LOW	RV	HIGH	LOW	RV	HIGH
GRASSES & GRASS-LIKES			870	1155	1540	690	1020	1450	330	660	990
FORBS			65	140	215	55	90	125	35	80	125
SHRUBS			65	105	145	55	90	125	35	60	85
TOTAL			1000	1400	1900	800	1200	1700	400	800	1200

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 and Vegetation State Narratives

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 information is collected, some of these plant community descriptions may be revised or removed, and new ones added. None of these plant communities should necessarily be thought of as “Desired Plant Communities”. According to the USDA NRCS National Range and Pasture Handbook, Desired Plant Communities (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.

Needlegrass/Grama/Little Bluestem Plant Community

The plant community upon which interpretations are primarily based is the Needlegrass/Grama/Little Bluestem Plant Community. This is also considered to be the Historic Climax Plant Community (HPC). This plant community can be found on areas that are properly managed with grazing and/or prescribed burning, and on areas receiving occasional short periods of deferment. The potential vegetation is about 75-85% grasses or grass-like plants, 5-15% forbs, and 5-10% shrubs. A mixture of cool and warm season grasses dominates the plant community. Major grasses include little bluestem, needleandthread, sideoats grama and blue grama. Other grasses and grass-like occurring include sedge, western wheatgrass, green needlegrass and prairie junegrass. Significant forbs include purple coneflower, dotted gayfeather and prairie clover. Significant shrubs found in this plant community include fringed sagewort, rose and yucca.

This plant community is extremely resilient and well adapted to the Northern Great Plains climatic conditions. The diversity in plant species allows for high drought tolerance. Community dynamics, nutrient cycle, water cycle and energy flow are functioning properly. Plant litter is properly distributed with very little movement off-site and natural plant mortality is very low. The diversity in plant species allows for high drought tolerance.

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

Growth curve number: SD6003

Growth curve name: Pierre Shale Plains, cool-season/warm-season co-dominant.

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

JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
0	0	3	10	20	28	21	10	5	3	0	0

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

- Continuous seasonal grazing (early season grazing with high stock densities results in increased soil disturbance and favors the little bluestem) or continuous season-long grazing (low to moderate stocking rates resulting in patch grazing) will convert this plant community to the *Little Bluestem/Grama Plant Community*.
- Non-use and no fire will also shift this plant community to the *Little Bluestem/Grama Plant Community*.

Little Bluestem/Grama Plant Community

This plant community develops under continuous seasonal grazing or continuous season-long grazing and a low fire frequency. This plant community can also result from extended periods of non-use and no fire. Little bluestem dominates this plant community, as it takes advantage of soil disturbance (resulting from hoof action, or increased bare ground due to reduced plant vigor under non-use and no fire).

Other significant grasses or grass-likes include blue grama, sideoats grama and sedge. Forbs commonly found in this plant community include cudweed sagewort, purple coneflower and dotted gayfeather. Significant shrubs include fringed sagewort and rose. The potential vegetation is about 80-90% grasses or grass-like plants, 5-10% forbs, and 5-10% shrubs. Although production remains relatively high, little bluestem plants often become “wooly”, and largely unavailable to most herbivores.

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 shows the estimated monthly percentages of total annual growth of the dominant species expected during an average year:

Growth curve number: SD6005

Growth curve name: Pierre Shale 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

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

- Heavy continuous grazing will convert the plant community to the *Blue Grama/Sedge Plant Community*.
- Prescribed grazing or prescribed burning followed by prescribed grazing will convert this plant community to the *Needlegrass/Grama/Little Bluestem Plant Community*.

Blue Grama/Sedge Plant Community

This plant community is a result from heavy grazing over many years. Diversity is diminished, as the short grasses become dominant in the plant community. The grazing tolerant blue grama and sedges replace little bluestem, western wheatgrass and the needlegrasses. Sideoats grama remains in the plant community, but is less productive because of competition and grazing pressure. Due to low palatability, cudweed sagewort, milkvetch, heath aster and green sagewort become more prevalent in the plant community. Fringed sagewort is the dominant shrub in this plant community. The potential vegetation is about 75-85% grasses or grass-like plants, 5-15% forbs, and 5-10% shrubs.

This plant community is resistant to change. The herbaceous species present are less palatable than the dominant species in the HCPC.

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: SD6004

Growth curve name: Pierre Shale Plains, warm-season dominant, cool-season sub-dominant.

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

JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
0	0	3	7	18	25	25	15	7	1	0	0

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

- Long-term prescribed grazing that includes changing season of use and allowing adequate recovery periods will slowly lead this plant community back to the *Little Bluestem/Grama Plant Community*.

Ecological Site Interpretations

Animal Community – Wildlife Interpretations

-- Under Development --

Needlegrass/Grama/Little Bluestem Plant Community:

Little Bluestem/Grama Plant Community:

Blue Grama/Sedge Plant Community:

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

Common Name	Cattle	Sheep	Horses	Deer	Antelope	Bison	Elk
Grasses & Grass-likes							
big bluestem	U D P D	U U D 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 D	D P P D	U D P U	D P P D	D P P D	U D P U	U D P U
buffalograss	U U P D	U U P D	U U D U	N U D U	N U D U	U U D U	U U D U
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 D	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	U U D U	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
Sandberg bluegrass	U U U U	U D U U	N U N N	N D N N	N D N N	N U N N	N U N N
sedge	U P U D	U P U 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 D	U P D D	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 D	U D U U	U P D U	N D N N	N D N N	U P D U	U P D U
Forbs							
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
dalea	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
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
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
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
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
milkvetch	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
miner's candle	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
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
pussytoes	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
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
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
sego lily	U P P U	U P P U	U P P U	U P P U	U P P U	U P P U	U P P U
spiny phlox	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
western ragweed	U U U U	U U U U	U U U U	N N N N	N N N N	U U U U	N N N N
Shrubs							
catclaw sensitive briar	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
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
skunkbush sumac	D U U D	D D D D	D U U D	D U U D	D U U D	D U U D	D U U D
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 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 ecological site 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)
Needlegrass/Grama/Little Bluestem	1400	0.35 – 0.45
Little Bluestem/Grama	1200	0.25 – 0.35
Blue Grama/Sedge	800	0.15 – 0.25

* Based on 790 lbs./acre (air-dry weight) per Animal Unit Month (AUM), and on 25% harvest efficiency (refer to USDA 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 group B and C. Infiltration ranges from moderately slow to moderate. Runoff potential for this site varies from medium to very high depending on soil hydrologic group, slope and ground cover. In many cases, areas with greater than 75% ground cover have the greatest potential for high infiltration and lower runoff. An example of an exception would be where short grasses form a strong sod and dominate the site. Normally areas where ground cover is less than 50% have the greatest potential to have reduced infiltration and higher runoff (refer to Section 4, NRCS National Engineering Handbook for runoff quantities and hydrologic curves).

Recreational Uses

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

Wood Products

Other Products

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

Supporting Information

Associated Sites

(060AY011SD) – Clayey 13-16" P.Z.

(060AY040SD) – Clayey 16-18" P.Z.

(060AY010SD) – Loamy 13-16" P.Z.

(060AY041SD) – Loamy 16-18" P.Z.

(060AY009SD) – Sandy

(060AY024SD) – Shallow Loamy

Similar Sites

(060AY024SD) – Shallow Loamy
[less little bluestem; soils shallow to rock, gravel or other root restrictive layer
(20 inches or less)]

Inventory Data References

Information presented here has been derived from NRCS clipping data and other inventory data. Field observations from range trained personnel was also used. Those involved in developing this site description include: Stan Boltz, Range Management Specialist, NRCS; Darrel DuVall, Range Management Specialist, NRCS; Jill Epley, Range Management Specialist, NRCS; Cheryl Nielsen, Range Management Specialist, NRCS; Rick Peterson, Range Management Specialist, NRCS; Mike Stirling, Range Management Specialist, NRCS.

<u>Data Source</u>	<u>Number of Records</u>	<u>Sample Period</u>	<u>State</u>	<u>County</u>
SCS-RANGE-417	8	1985 – 1990	SD	Custer, Pennington

State Correlation

This site has been correlated between Montana, Nebraska, South Dakota & Wyoming in MLRA 60A.

Field Offices

Belle Fourche, SD	Custer, SD	Hot Springs, SD	Pine Ridge, SD	Sundance, WY
Broadus, MT	Ekalaka, MT	Lusk, WY	Rapid City, SD	Wall, SD
Buffalo, SD	Faith, SD	Martin, SD	Rushville, NE	
Chadron, NE	Gillette, WY	Newcastle, WY	Sturgis, SD	

Relationship to Other Established Classifications

Level IV Ecoregions of the Conterminous United States: 43e – Sagebrush Steppe, 43g – Semiarid Pierre Shale Plains, and 43k – Dense Clay Prairie.

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://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, 2002. National Soil Survey Handbook, title 430-VI. (<http://soils.usda.gov/procedures/handbook/main.htm>)

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

_____ MT, State Range Management Specialist	_____ Date	_____ NE, State Range Management Specialist	_____ Date
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_____ SD, State Range Management Specialist	_____ Date	_____ WY, State Range Management Specialist	_____ Date
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