

United States Department of Agriculture Natural Resources Conservation Service

Ecological Site Description

Site Type: Rangeland

Site Name: Thin Upland

Site ID: R063AY012SD

Major Land Resource Area (MLRA): 63A –
Northern Rolling Pierre Shale Plains



Physiographic Features

This site occurs on nearly level to sloping uplands.

Landform: escarpment, ridge, moraine, terrace

Aspect: N/A

	<u>Minimum</u>	<u>Maximum</u>
Elevation (feet):	1600	2700
Slope (percent):	6	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:	Low	Very high

Climatic Features

MLRA 63A is considered to have a continental climate – cold winters and hot summers, low humidity, light rainfall, and much sunshine. Extremes in temperature may also abound. The climate is the result of this MLRA's location near the geographic center of North America. There are few natural barriers on the Northern Great Plains and air masses move freely across the plains and account for rapid changes in temperature.

Annual precipitation ranges from 16 to 20 inches per year. The average annual temperature is about 47°F. January is the coldest month with average temperatures ranging from about 11°F (Pollock, South Dakota (SD)), to about 22°F (Cedar Butte, SD). July is the warmest month with temperatures averaging from about 72°F (Pollock, SD), to about 76°F (Cedar Butte, SD). The range of normal average monthly temperatures between the coldest and warmest months is about 58°F. This large annual range attests to the continental nature of this area's climate. Hourly winds are estimated to average about 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 cool-season plants begins in early to mid-March, slowing or ceasing in late June. Warm-season plants begin growth about mid-May and continue to early or mid-September. 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):	126	149
Freeze-free period (days):	149	165
Mean Annual Precipitation (inches):	16	20
Average Monthly Precipitation (inches) and Temperature (°F):		

	Precip. Min.	Precip. Max	Temp. Min.	Temp. Max.
January	0.40	0.41	-0.9	34.0
February	0.44	0.49	5.8	39.2
March	0.87	1.36	17.3	49.0
April	1.77	2.18	31.3	61.2
May	2.82	3.29	43.3	72.2
June	2.96	3.45	53.2	82.5
July	2.04	2.84	58.5	90.8
August	1.57	2.38	56.5	90.3
September	1.13	1.53	45.4	79.2
October	1.02	1.38	33.4	65.7
November	0.48	0.63	19.3	48.2
December	0.23	0.35	5.7	37.2

Climate Stations		Period	
Station ID	Location or Name	From	To
SD1539	Cedar Butte	1951	2004
SD1972	Cottonwood 3 E	1909	2004
SD6712	Pollock	1948	2004
SD6790	Presho 7 NW	1975	2004

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

Riparian and Wetland Features

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

Representative Soil Features

The features common to soils in this site are the clay to loam textured surface layers and slopes of 6 to 45 percent. The soils in this site are well to excessively drained and formed in residuum from clay shale or glacial till. The surface layer is three to eight inches thick. The texture of the subsurface layers ranges from clay to loam. The soils have a slow to moderately rapid 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, 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 wind and water erosion. The hazard of water erosion increases on slopes greater than about 15 percent. Loss of 50 percent or more of the surface layer of the soils on this site can result in a shift in species composition and/or production.

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

Parent Material Kind: residuum
Parent Material Origin: shale, clayey
Surface Texture: silty clay, clay, loam
Surface Texture Modifier: none or gravelly
Subsurface Texture Group: clayey
Surface Fragments ≤3" (% Cover): 0-35
Surface Fragments >3" (%Cover): 0-5
Subsurface Fragments ≤3" (% Volume): 0-45
Subsurface Fragments >3" (% Volume): 0-5

	<u>Minimum</u>	<u>Maximum</u>
Drainage Class:	well	excessively
Permeability Class:	slow	moderately rapid
Depth to Bedrock (inches):	20	80
Electrical Conductivity (mmhos/cm)*:	0	2
Sodium Absorption Ratio*:	0	3
Soil Reaction (1:1 Water)*:	7.4	8.4
Soil Reaction (0.1M CaCl₂)*:	NA	NA
Available Water Capacity (inches)*:	4	5
Calcium Carbonate Equivalent (percent)*:	5	30

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

Plant Communities

Ecological Dynamics of the Site:

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

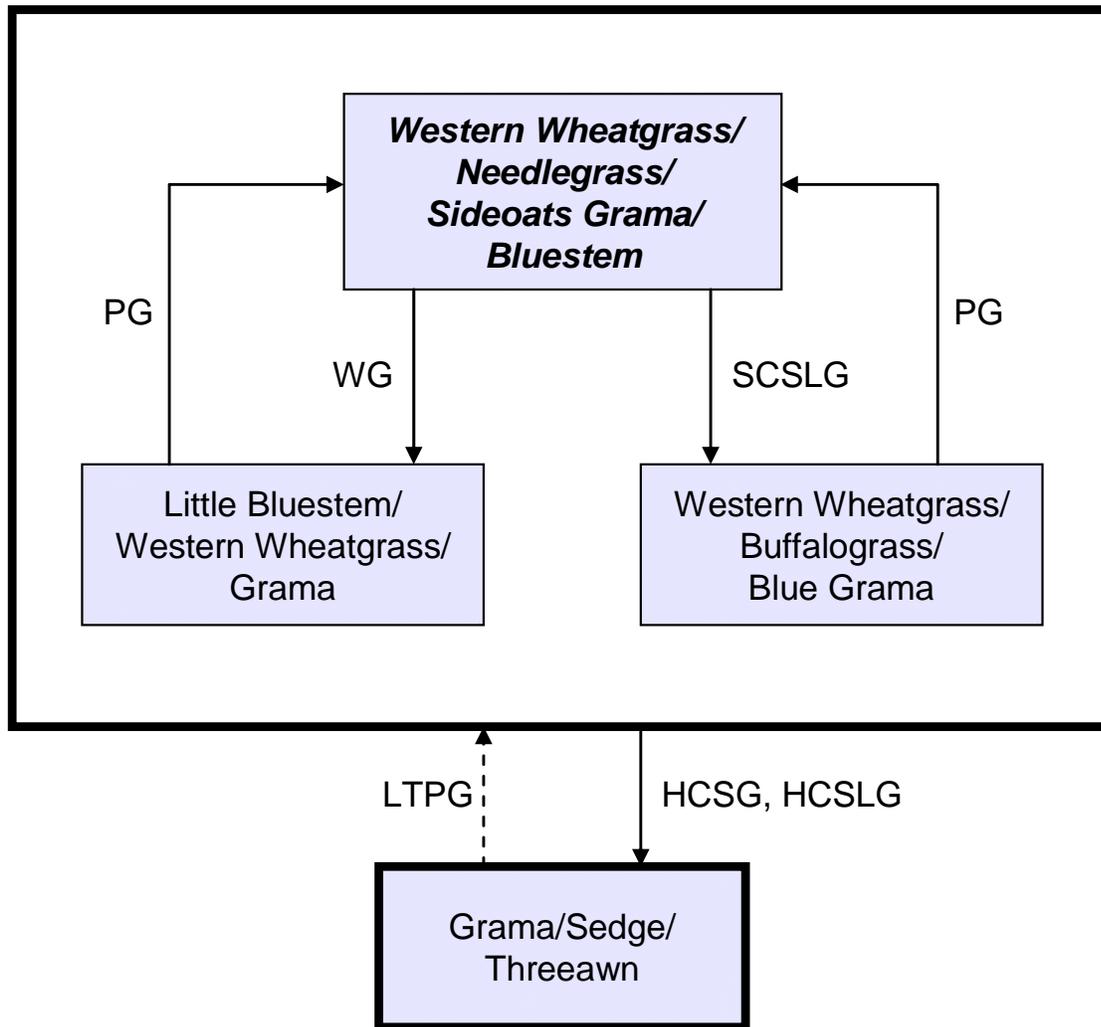
Continuous season-long grazing (during the typical growing season of May through October) and/or repeated seasonal grazing (e.g., every spring, every summer) without adequate recovery periods following each grazing occurrence causes this site to depart from the Western Wheatgrass/Needlegrass/Sideoats Grama/Bluestem Plant Community. Species such as sedge and blue grama will increase and begin to dominate if disturbances are intense and long lasting.

Interpretations are primarily based on the Western Wheatgrass/Needlegrass/Sideoats Grama/Bluestem Plant Community. It has been determined by study of rangeland relic areas, areas protected from excessive disturbance, and areas under long-term rotational grazing regimes. Trends in plant community dynamics ranging from heavily grazed to lightly grazed areas, seasonal use

pastures, and historical accounts also have been used. Plant communities, states, transitional pathways, and thresholds have been determined through similar studies and experience.

The following diagram illustrates the common plant communities and vegetation states commonly occurring on the site and the transition pathways between communities and states. The ecological processes will be discussed in more detail in the plant community descriptions following the diagram.

Plant Communities and Transitional Pathways



HCSG – Heavy continuous seasonal grazing; **HCSLG** – Heavy continuous season-long grazing; **LTPG** – Long-term prescribed grazing; **PG** – Prescribed grazing (planned, controlled harvest of vegetation with grazing or browsing animals – see FOTG, Section IV, 528); **SCSLG** – Summer continuous season-long grazing; **WG** – Winter grazing.

Plant Community Composition and Group Annual Production

COMMON/GROUP NAME	SCIENTIFIC NAME	SYMBOL	Western Wheatgrass/Needlegrass/ Sideoats Grama/Bluestem		
			Group	lbs./acre	% Comp
GRASSES & GRASS-LIKES				1600 - 1800	80 - 90
western wheatgrass	Pascopyrum smithii	PASM	1	300 - 700	15 - 35
TALL/MID WARM-SEASON GRASSES			2	300 - 600	15 - 30
sideoats grama	Bouteloua curtipendula	BOCU	2	200 - 400	10 - 20
big bluestem	Andropogon gerardii	ANGE	2	100 - 300	5 - 15
little bluestem	Schizachyrium scoparium	SCSC	2	0 - 200	0 - 10
plains muhly	Muhlenbergia cuspidata	MUCU3	2	0 - 100	0 - 5
NEEDLEGRASS			3	200 - 400	10 - 20
green needlegrass	Nassella viridula	NAVI4	3	100 - 400	5 - 20
porcupine grass	Hesperostipa spartea	HESP11	3	40 - 200	2 - 10
needleandthread	Hesperostipa comata ssp. comata	HECOC8	3	0 - 100	0 - 5
SHORT WARM-SEASON GRASSES			4	100 - 300	5 - 15
blue grama	Bouteloua gracilis	BOGR2	4	40 - 200	2 - 10
buffalograss	Bouteloua dactyloides	BODA2	4	40 - 200	2 - 10
threeawn	Aristida spp.	ARIST	4	0 - 100	0 - 5
inland saltgrass	Distichlis spicata	DISP	4	0 - 60	0 - 3
OTHER NATIVE GRASSES			5	20 - 100	1 - 5
prairie junegrass	Koeleria macrantha	KOMA	5	20 - 60	1 - 3
dropseed	Sporobolus spp.	SPORO	5	0 - 60	0 - 3
sixweeks fescue	Vulpia octoflora	VUOC	5	0 - 20	0 - 1
bottlebrush squirreltail	Elymus elymoides	ELEL5	5	0 - 20	0 - 1
other perennial grasses		2GP	5	0 - 60	0 - 3
GRASS-LIKES			6	40 - 200	2 - 10
threadleaf sedge	Carex filifolia	CAFI	6	20 - 160	1 - 8
needleleaf sedge	Carex duriuscula	CADU6	6	20 - 160	1 - 8
other grass-likes		2GL	6	0 - 100	0 - 5
FORBS			8	100 - 200	5 - 10
bigtop dalea	Dalea enneandra	DAEN	8	0 - 20	0 - 1
biscuitroot	Lomatium spp.	LOMAT	8	0 - 20	0 - 1
cudweed sagewort	Artemisia ludoviciana	ARLU	8	20 - 60	1 - 3
dotted gayfeather	Liatris punctata	LIPU	8	20 - 40	1 - 2
false boneset	Brickellia eupatorioides	BREU	8	0 - 40	0 - 2
fleabane	Erigeron spp.	ERIGE2	8	0 - 20	0 - 1
goldenpea	Thermopsis rhombifolia	THRH	8	0 - 40	0 - 2
goldenrod	Solidago spp.	SOLID	8	20 - 40	1 - 2
hairy goldaster	Heterotheca villosa	HEVI4	8	0 - 20	0 - 1
heath aster	Symphotrichum ericoides	SYER	8	20 - 60	1 - 3
Indian breadroot	Pediomelum esculentum	PEES	8	0 - 20	0 - 1
milkwort	Polygala spp.	POLYG	8	0 - 20	0 - 1
Nuttall's violet	Viola nuttallii	VINU2	8	0 - 20	0 - 1
prairie clover	Dalea spp.	DALEA	8	20 - 40	1 - 2
prairie coneflower	Ratibida columnifera	RACO3	8	20 - 40	1 - 2
purple coneflower	Echinacea angustifolia	ECAN2	8	20 - 60	1 - 3
scarlet globemallow	Sphaeralcea coccinea	SPCO	8	20 - 40	1 - 2
silverleaf scurfpea	Pediomelum argophyllum	PEAR6	8	20 - 40	1 - 2
spiny phlox	Phlox hoodii	PHHO	8	0 - 20	0 - 1
tall breadroot	Pediomelum cuspidatum	PECU3	8	0 - 20	0 - 1
wavyleaf thistle	Cirsium undulatum	CIUN	8	0 - 20	0 - 1
western wallflower	Erysimum capitatum var. capitatum	ERCAC	8	0 - 20	0 - 1
western yarrow	Achillea millefolium var. occidentalis	ACMIO	8	0 - 20	0 - 1
wild parsley	Musineon divaricatum	MUDI	8	20 - 40	1 - 2
woolly Indianwheat	Plantago patagonica	PLPA2	8	0 - 20	0 - 1
woolly locoweed	Astragalus mollissimus	ASMO7	8	0 - 20	0 - 1
native forbs		2FN	8	20 - 100	1 - 5
SHRUBS			9	100 - 200	5 - 10
catclaw sensitive briar	Mimosa nuttallii	MINU6	9	0 - 20	0 - 1
dwarf false indigo	Amorpha nana	AMNA	9	0 - 20	0 - 1
leadplant	Amorpha canescens	AMCA6	9	0 - 60	0 - 3
rose	Rosa spp.	ROSA5	9	20 - 60	1 - 3
skunkbush sumac	Rhus trilobata	RHTR	9	0 - 40	0 - 2
snowberry	Symphoricarpos spp.	SYMPH	9	0 - 60	0 - 3
other shrubs		2SHRUB	9	0 - 100	0 - 5

Annual Production lbs./acre	LOW	RV	HIGH
GRASSES & GRASS-LIKES	1210 -	1700	-2350
FORBS	95 -	150	-225
SHRUBS	95 -	150	-225
TOTAL	1400 -	2000	-2800

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	Western Wheatgrass/Needle-grass/Sideoats			Little Bluestem/Western Wheatgrass/Grama			Western Wheatgrass/Bufalo-grass/Blue Grama			Grama/Sedge/Threawn		
		Grp	lbs./acre	% Comp	Grp	lbs./acre	% Comp	Grp	lbs./acre	% Comp	Grp	lbs./acre	% Comp
GRASSES & GRASS-LIKES													
western wheatgrass	PASM	1	300 - 700	15 - 35	1	80 - 320	5 - 20	1	140 - 420	10 - 30	1	0 - 55	0 - 5
TALL/MID WARM-SEASON													
sideoats grama	BOCU	2	200 - 400	10 - 20	2	80 - 240	5 - 15	2	0 - 70	0 - 5	2	0 - 33	0 - 3
big bluestem	ANGE	2	100 - 300	5 - 15	2	0 - 80	0 - 5						
little bluestem	SCSC	2	0 - 200	0 - 10	2	160 - 400	10 - 25	2	0 - 70	0 - 5			
plains muhly	MUCU3	2	0 - 100	0 - 5	2	0 - 80	0 - 5						
NEEDLEGRASS													
green needlegrass	NAVI4	3	100 - 400	5 - 20	3	0 - 80	0 - 5		0 - 70	0 - 5			
porcupine grass	HESP11	3	40 - 200	2 - 10	3	0 - 80	0 - 5						
needleandthread	HECOC8	3	0 - 100	0 - 5	3	0 - 80	0 - 5	3	0 - 70	0 - 5			
SHORT WARM-SEASON GRASSES													
blue grama	BOGR2	4	40 - 200	2 - 10	4	80 - 240	5 - 15	4	210 - 420	15 - 30	4	220 - 440	20 - 40
buffalograss	BODA2	4	40 - 200	2 - 10	4	32 - 160	2 - 10	4	70 - 280	5 - 20	4	55 - 220	5 - 20
threawn	ARIST	4	0 - 100	0 - 5	4	16 - 128	1 - 8	4	14 - 140	1 - 10	4	22 - 165	2 - 15
inland saltgrass	DISP	4	0 - 60	0 - 3	4	0 - 80	0 - 5	4	14 - 112	1 - 8	4	11 - 110	1 - 10
OTHER NATIVE GRASSES													
prairie junegrass	KOMA	5	20 - 60	1 - 3	5	16 - 32	1 - 2	5	0 - 28	0 - 2	5	0 - 11	0 - 1
dropseed	SPORO	5	0 - 60	0 - 3	5	16 - 48	1 - 3	5	0 - 28	0 - 2	5	0 - 33	0 - 3
sixweeks fescue	VUOC	5	0 - 20	0 - 1	5	0 - 16	0 - 1	5	0 - 14	0 - 1			
bottlebrush squirreltail	ELEL5	5	0 - 20	0 - 1	5	0 - 16	0 - 1	5	0 - 14	0 - 1			
other perennial grasses	ZGP	5	0 - 60	0 - 3	5	0 - 48	0 - 3	5	0 - 42	0 - 3	5	0 - 22	0 - 2
GRASS-LIKES													
threadleaf sedge	CAFI	6	20 - 160	1 - 8	6	32 - 192	2 - 12	6	70 - 210	5 - 15	6	110 - 275	10 - 25
needleleaf sedge	CADU6	6	20 - 160	1 - 8	6	16 - 160	1 - 10	6	28 - 140	2 - 10	6	22 - 165	2 - 15
other grass-likes	ZGL	6	0 - 100	0 - 5	6	0 - 80	0 - 5	6	0 - 70	0 - 5	6	0 - 55	0 - 5
NON-NATIVE GRASSES													
cheatgrass	BRTE				7	0 - 80	0 - 5	7	0 - 42	0 - 3	7	11 - 110	1 - 10
bluegrass	POA				7	0 - 48	0 - 3	7	14 - 112	1 - 8	7	0 - 110	0 - 10
FORBS													
bigtop dalea	DAEN	8	0 - 20	0 - 1									
biscuitroot	LOMAT	8	0 - 20	0 - 1	8	0 - 16	0 - 1	8	0 - 14	0 - 1			
cudweed sagewort	ARLU	8	20 - 60	1 - 3	8	16 - 64	1 - 4	8	14 - 70	1 - 5	8	11 - 55	1 - 5
dotted gayfeather	LIPU	8	20 - 40	1 - 2	8	0 - 16	0 - 1	8	0 - 14	0 - 1			
false boneset	BREU	8	0 - 40	0 - 2	8	0 - 16	0 - 1	8	0 - 14	0 - 1			
fleabane	FRIGF2	8	0 - 20	0 - 1									
goldenpea	THRH	8	0 - 40	0 - 2	8	0 - 16	0 - 1	8	0 - 14	0 - 1			
goldenrod	SOLID	8	20 - 40	1 - 2	8	16 - 48	1 - 3	8	14 - 42	1 - 3	8	0 - 22	0 - 2
hairy goldaster	HEVI4	8	0 - 20	0 - 1									
Indian breadroot	PEES	8	0 - 20	0 - 1									
milkwort	POLYG	8	0 - 20	0 - 1	8	0 - 16	0 - 1	8	0 - 14	0 - 1			
Nuttall's violet	VINU2	8	0 - 20	0 - 1									
prairie clover	DALEA	8	20 - 40	1 - 2	8	0 - 16	0 - 1	8	0 - 14	0 - 1			
prairie coneflower	RAC03	8	20 - 40	1 - 2	8	16 - 32	1 - 2	8	14 - 28	1 - 2	8	0 - 11	0 - 1
purple coneflower	ECAN2	8	20 - 60	1 - 3	8	0 - 32	0 - 2	8	0 - 28	0 - 2			
scarlet globemallow	SPCO	8	20 - 40	1 - 2	8	16 - 32	1 - 2	8	14 - 28	1 - 2	8	0 - 11	0 - 1
silverleaf scurfpea	PEAR6	8	20 - 40	1 - 2	8	16 - 32	1 - 2	8	14 - 56	1 - 4	8	0 - 22	0 - 2
spiny phlox	PHHO	8	0 - 20	0 - 1	8	0 - 16	0 - 1	8	0 - 14	0 - 1	8	0 - 11	0 - 1
sweetclover	MELIL				8	0 - 80	0 - 5	8	0 - 140	0 - 10	8	0 - 66	0 - 6
tall breadroot	PECU3	8	0 - 20	0 - 1									
wayleaf thistle	CIUN	8	0 - 20	0 - 1	8	0 - 16	0 - 1	8	0 - 14	0 - 1			
western salsify	TRDU				8	16 - 32	1 - 2	8	14 - 56	1 - 4	8	0 - 22	0 - 2
western wallflower	ERCAC	8	0 - 20	0 - 1	8	0 - 16	0 - 1	8	0 - 14	0 - 1			
western yarrow	ACMIO	8	0 - 20	0 - 1	8	16 - 32	1 - 2	8	14 - 42	1 - 3	8	11 - 22	1 - 2
white prairie aster	SYFA	8	20 - 60	1 - 3	8	16 - 48	1 - 3	8	14 - 42	1 - 3	8	0 - 22	0 - 2
wild parsley	MUDI	8	20 - 40	1 - 2	8	0 - 16	0 - 1	8	0 - 14	0 - 1			
wooly Indianwheat	PLPA2	8	0 - 20	0 - 1	8	0 - 16	0 - 1	8	0 - 28	0 - 2	8	0 - 11	0 - 1
wooly locoweed	ASMO7	8	0 - 20	0 - 1	8	0 - 16	0 - 1	8	0 - 14	0 - 1			
native forbs	ZFN	8	20 - 100	1 - 5	8	16 - 48	1 - 3	8	14 - 42	1 - 3	8	0 - 33	0 - 3
introduced forbs	ZFI				8	0 - 64	0 - 4	8	0 - 70	0 - 5	8	0 - 55	0 - 5
SHRUBS													
catclaw sensitive briar	MINU6	9	0 - 20	0 - 1									
dwarf false indigo	AMNA	9	0 - 20	0 - 1									
leadplant	AMCA6	9	0 - 60	0 - 3	9	0 - 16	0 - 1						
rose	ROSA5	9	20 - 60	1 - 3	9	16 - 48	1 - 3	9	14 - 42	1 - 3	9	0 - 22	0 - 2
skunkbush sumac	RHTR	9	0 - 40	0 - 2	9	0 - 32	0 - 2	9	0 - 28	0 - 2			
snowberry	SYMPH	9	0 - 60	0 - 3	9	16 - 80	1 - 5	9	14 - 42	1 - 3	9	0 - 22	0 - 2
other shrubs	ZSHRUB	9	0 - 100	0 - 5	9	0 - 80	0 - 5	9	0 - 42	0 - 3	9	0 - 33	0 - 3
Annual Production lbs./acre													
GRASSES & GRASS-LIKES			LOW	RV	HIGH		LOW	RV	HIGH		LOW	RV	HIGH
FORBS			95	150	205		75	120	165		65	140	215
SHRUBS			95	150	205		30	80	130		10	42	75
TOTAL			1400	2000	2800		1000	1600	2300		900	1400	2100

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

Plant Community and Vegetation State Narratives

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 recurring 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 is 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 United States Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS) National Range and Pasture Handbook, DPCs 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.

Western Wheatgrass/Needlegrass/Sideoats Grama/Bluestem Plant Community

Interpretations are based primarily on the Western Wheatgrass/Needlegrass/Sideoats Grama/Bluestem Plant Community, which is considered to be climax. This site evolved with grazing by large herbivores and occasional prairie fires. This plant community can be found on areas having a history of proper grazing management, including adequate recovery periods between grazing events. The potential vegetation is about 80 percent grasses or grass-like plants, 10 percent forbs, and 10 percent shrubs. Western wheatgrass, green needlegrass, sideoats grama, big bluestem, and little bluestem dominate the plant community. Other grasses and grass-like plants occurring on the site include blue grama, buffalograss, porcupine grass, and sedges. Significant forbs include cudweed sagewort, heath aster, and purple coneflower. Rose is a shrub often found on this site.

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 at the sites potential. 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.

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: SD6302

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

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

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

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

- Winter grazing will convert the plant community to a *Little Bluestem/Western Wheatgrass/Grama Plant Community*. With late/early season grazing and high stock densities, an increase in soil disturbance occurs which favors the little bluestem and decreases the cool-season species with a significant decrease in needlegrasses.
- Summer continuous season-long grazing will shift the community to a *Western Wheatgrass/Buffalograss/Blue Grama Community*. Over grazing the same pasture during the same season every year will cause the tall/mid warm-season grasses to decrease and be replaced by shortgrasses blue grama and buffalograss.

Little Bluestem/Western Wheatgrass/Grama

This plant community develops from winter grazing. 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 nonuse, over use, or no fire). Although production remains relatively high, little bluestem plants often become “wooly,” and are largely unavailable in typical grazing scenarios. Other significant grasses or grass-likes include western wheatgrass, sideoats grama, blue grama, buffalograss, and sedges. The potential vegetation is about 80 percent grasses or grass-like plants, 10 percent forbs, and 10 percent shrubs.

This plant community is moderately resistant to change. The herbaceous species present are well adapted to grazing; however, species composition can be altered through long-term overgrazing. If the herbaceous component is intact, it tends to be resilient if the disturbance is not long-term.

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

Growth curve number: SD6305

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

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

- Heavy continuous seasonal grazing or heavy continuous season-long grazing will convert the plant community to the *Grama/Sedge/Threawn Plant Community*. Shortgrasses replace the mid/tall grasses due to heavy grazing over many years.
- Prescribed grazing, which allows for adequate plant recovery time, can shift this plant community back to the *Western Wheatgrass/Needlegrass/Sideoats Grama/Bluestem Plant Community*. Periods of nonuse or deferment may be a management option to reach the Historic Climax Plant Community.

Western Wheatgrass/Buffalograss/Blue Grama

This plant community is a result from heavily grazing the same area at the same time of year over many years. A decrease in diversity is seen, as the mid/tall warm-season grasses decrease and the shortgrasses increase. The grazing-tolerant blue grama and sedges replace the bluestems and needlegrasses. Sideoats grama remains in the plant community, but is less productive because of competition and grazing pressure. Significant grass or grass-like species that are prevalent on this site include western wheatgrass, buffalograss, blue grama, sideoats grama, little bluestem, threeawns, and sedges. Dominant forbs include heath aster and prairie coneflower. The potential vegetation is made up of 80 percent grass or grass-like plants, 10 percent forbs, and 10 percent shrubs. Species composition and production can be found in the plant community composition and group annual production table.

This plant community is moderately resistant to change. The herbaceous species present are well adapted to grazing; however, species composition can be altered through long-term overgrazing. If the herbaceous component is intact, it tends to be resilient if the disturbance is not long-term.

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

Growth curve number: SD6303

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

Growth curve description: Cool-season, warm-season codominant.

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

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

- Heavy continuous seasonal grazing or heavy continuous season-long grazing will convert the plant community to the *Grama/Sedge/Threeawn Plant Community*. Shortgrasses replace the mid/tall grasses due to heavy grazing over many years.
- Prescribed grazing, which allows for adequate plant recovery time, can shift this plant community back to the *Western Wheatgrass/Needlegrass/Sideoats Grama/Bluestem Plant Community*. Periods of nonuse or deferment may be a management option to reach the Historic Climax Plant Community.

Grama/Sedge/Threeawn

This plant community is a result from heavy continuous seasonal grazing or heavy continuous season-long grazing. Diversity greatly diminishes, as the shortgrasses/sedges become dominant on the site. The grazing tolerant blue grama, sedges, and threeawn replace little bluestem, western wheatgrass, and needlegrasses. Due to low palatability, cudweed sagewort and heath aster become more prevalent in the plant community. Potential vegetation is made up of 75-85 percent grass or grass-like plants, 5-10 percent forbs, and 5-10 percent shrubs.

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

Growth curve number: SD6304

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

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

JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
0	0	3	7	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, which allows for adequate plant recovery time, can eventually shift this plant community back to the *Western Wheatgrass/Needlegrass/Sideoats Grama/Bluestem Plant Community*. Periods of nonuse or deferment may be a management option to reach the Historic Climax Plant Community. Depending on the slope, aspect, size, and if adequate perennial plants exist, this change can occur more rapidly.

Ecological Site Interpretations

Animal Community – Wildlife Interpretations

-- Under Development --

Western Wheatgrass/Needlegrass/Sideoats Grama/Bluestem Plant Community:

Little Bluestem/Western Wheatgrass/Grama Plant Community:

Western Wheatgrass/Buffalograss/Blue Grama Plant Community:

Grama/Sedge/Threeawn 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 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
bottlebrush squirreltail	U D U U	N D U N	U D U U	N D U N	N D U N	U D U U	U D U U
buffalograss	U U D U	N U D U	U U D U	N U D U	N U D U	U U D U	U U D U
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
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
inland saltgrass	N U U N	N N N N	N U U N	N N N N	N N N N	N U U N	N U U N
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
needleleaf 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
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
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
sixweeks fescue	N N N N	N U N N	N N N N	N U N N	N U N N	N N N N	N N N N
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
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
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							
bigtop 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
biscuitroot	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
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
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
fleabane	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
goldenpea	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
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
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
milkwort	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
Nuttall's violet	N U N N	N U N N	N U N N	N U N N	N U N N	N U N N	N U N N
prairie 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
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
silverleaf 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
spiny 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
tall breadroot	U D U U	U D U U	U D U U	U D U U	U D U U	U D U U	U D U 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
wild parsley	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
woolly Indianwheat	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
woolly locoweed	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
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
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 U U D	D U U D	D U U D	D U U D	D U U D	D U U D
snowberry	U U U U	U U U U	U U U U	D U D D	U U U U	U U U U	D U U U

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

† 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)
Western Wheatgrass/Needlegrass/Sideoats Grama/Bluestem	2000	0.55
Little Bluestem/Western Wheatgrass/Grama	1800	0.49
Western Wheatgrass/Buffalograss/Blue Grama	1600	0.44
Grama/Sedge/Threeawn	1000	0.27

*Based on 912 lbs./acre (air-dry weight) per Animal Unit Month (AUM), and on 25 percent 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. Where little bluestem plants become “wolfy,” changing livestock class (e.g., using yearlings) will often result in considerably higher use of the decadent little bluestem plants.

Hydrology Functions

Water is the principal factor limiting forage production on this site. This site is dominated by soils in hydrologic groups B and D. Infiltration and runoff potential for this site varies from very slow to moderately rapid depending on soil hydrologic group, slope, and ground cover. In many cases, areas with greater than 75 percent ground cover have the greatest potential for high infiltration and lower runoff. An example of an exception would be where shortgrasses form a strong sod and dominate the site. Dominance by blue grama and sedge will result in reduced infiltration and increased runoff. Areas where ground cover is less than 50 percent have the greatest potential to have reduced infiltration and higher runoff (refer to Section 4, NRCS National Engineering Handbook for runoff quantities and hydrologic curves).

Recreational Uses

This site provides hunting, hiking, photography, bird watching, and other opportunities. The wide varieties of plants that bloom from spring until fall have an esthetic value that appeals to visitors.

Wood Products

No appreciable wood products are typically present on this site.

Other Products

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

Supporting Information

Associated Sites

Loamy (R063AY010SD), Shallow Clay (R063AY017SD), Clayey (R063AY011SD), Shallow (R063AY024SD).

Similar Sites

(R063AY017SD) – Shallow Clay [less little bluestem; slightly lower production; 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 were also used. Those involved in developing this site include: April Boltjes, Range Management Specialist (RMS), NRCS; Stan Boltz, RMS, NRCS; Kent Cooley, Soil Scientist, NRCS; Rick Peterson, RMS, NRCS; and L. Michael Stirling, RMS, NRCS.

<u>Data Source</u>	<u>Number of Records</u>	<u>Sample Period</u>	<u>State</u>	<u>County</u>
SCS-RANGE-417	0			

State Correlation

MLRA 63A lies entirely within SD, so no cross-state correlation has occurred.

Field Offices/Counties

Dupree, SD	Ziebach	McIntosh, SD	Corson	Pierre, SD	Hughes/Stanley
Faith, SD	Meade	Mound City, SD	Campbell	Selby, SD	Walworth
Gettysburg, SD	Potter	Murdo, SD	Jones	Timber Lake, SD	Dewey
Kadoka, SD	Jackson	Onida, SD	Sully	Wall, SD	East Pennington
Kennebec, SD	Lyman	Philip, SD	Haakon	White River, SD	Mellette

Relationship to Other Established Classifications

Level IV Ecoregions of the Conterminous United States: 43c – River Breaks and 43f – Subhumid Pierre Shale Plains.

Other References

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

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 Type: Rangeland
MLRA: 63A – Northern Rolling Pierre Shale Plains

Thin Upland
R063AY012SD

Site Description Approval

SD, State Range Management Specialist

Date