

United States Department of Agriculture Natural Resources Conservation Service

Ecological Site Description

Site Type: Rangeland

Site Name: Subirrigated

Site ID: R063AY003SD

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



Physiographic Features

This site occurs on gently undulating to rolling sedimentary uplands and floodplains.

Landform: stream terrace, flood plain

Aspect: N/A

	<u>Minimum</u>	<u>Maximum</u>
Elevation (feet):	1600	2700
Slope (percent):	0	4
Water Table Depth (inches):	24	48
Flooding:		
Frequency:	None	Rare
Duration:	None	Very brief
Ponding:		
Depth (inches):	None	None
Frequency:	None	None
Duration:	None	None
Runoff Class:	Negligible	Very low

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

Wetland Description:	<u>System</u>	<u>Subsystem</u>	<u>Class</u>	<u>Subclass</u>
Cowardin, et al., 1979	Riverine	Intermittent	Unknown	

Representative Soil Features

The common features of soils in this site are the stratified loamy fine sand or very fine sand textured subsoil and slopes of zero to four percent. The soils in this site are moderately well drained and formed in sandy alluvium. The loamy fine sand surface layer is four to nine inches thick. The soils have a moderately rapid infiltration rate. This site should show no evidence of rills, wind scoured areas or pedestalled plants. The soil surface is stable and intact. Subsurface soil layers are non-restrictive to water movement and root penetration.

These soils are not susceptible to water erosion. There is little to inhibit a very productive plant community on this site. Some species that are not adapted to an occasional high water table may not be adapted, but generally the soils support a diverse and productive plant community.

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

Parent Material Kind: alluvium
Parent Material Origin: sandstone, unspecified
Surface Texture: loamy fine sand
Surface Texture Modifier: none
Subsurface Texture Group: sandy
Surface Fragments ≤3" (% Cover): 0
Surface Fragments >3" (%Cover): 0
Subsurface Fragments ≤3" (% Volume): 0
Subsurface Fragments >3" (% Volume): 0

	<u>Minimum</u>	<u>Maximum</u>
Drainage Class:	moderately well	moderately well
Permeability Class:	moderately rapid	moderately rapid
Depth (inches):	80	80
Electrical Conductivity (mmhos/cm)*:	0	2
Sodium Absorption Ratio*:	0	0
Soil Reaction (1:1 Water)*:	6.6	8.4
Soil Reaction (0.1M CaCl₂)*:	NA	NA
Available Water Capacity (inches)*:	3	4
Calcium Carbonate Equivalent (percent)*:	1	10

*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.

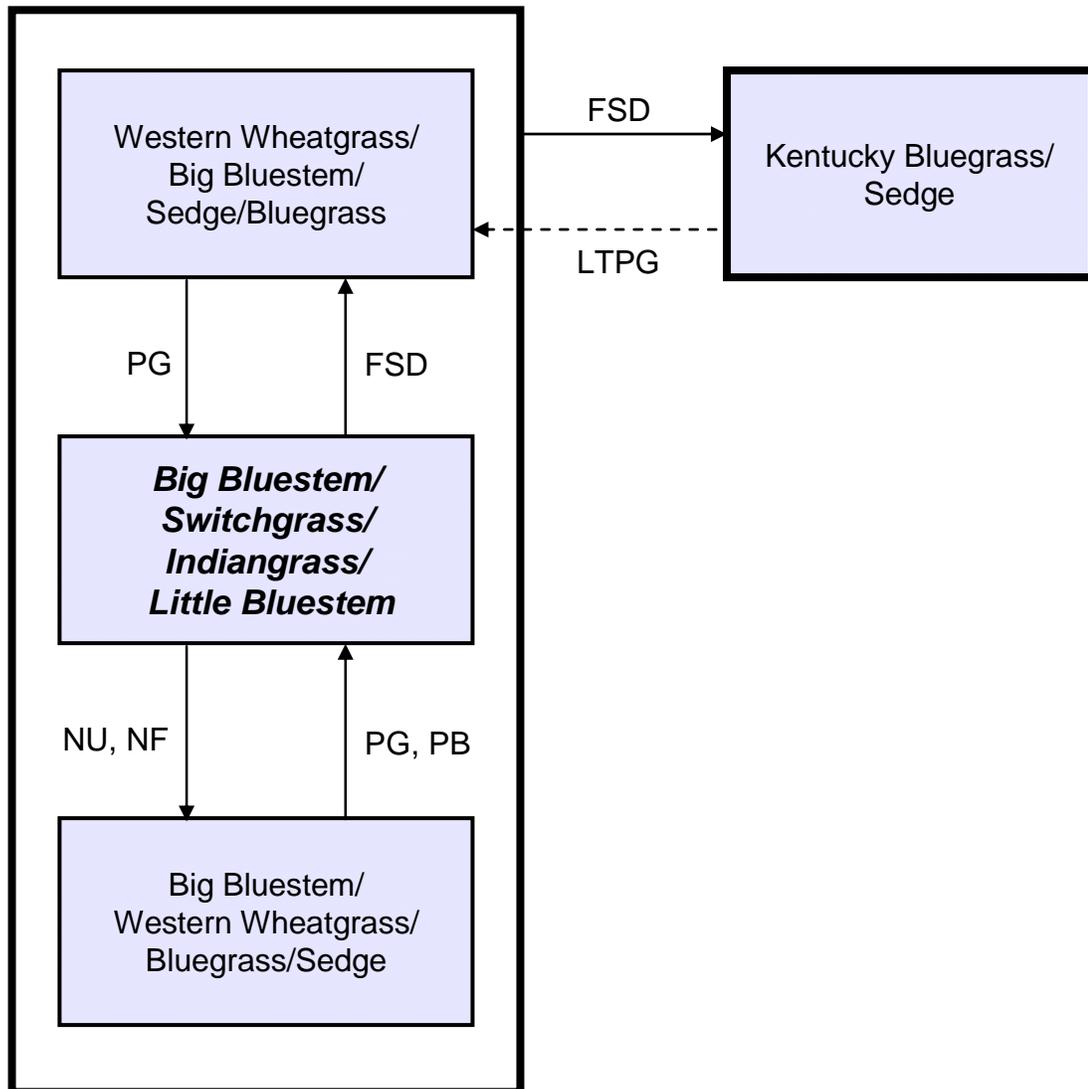
As this site deteriorates from a combination of frequent and severe grazing, species such as Kentucky bluegrass, rush, sedge, and other various grass-like will increase forming a cool-season dominated plant community. Kentucky bluegrass will eventually become sod-bound. Grasses such as big bluestem, prairie cordgrass, and switchgrass will decrease in frequency and production and can eventually be removed from the site. As the site continues to deteriorate, bare ground may increase depending on water table depth. Kentucky bluegrass will persist in a broken sod appearance. Excessive litter, decadence, and plant mortality can result from the lack of fire or nonuse.

The plant community upon which interpretations are primarily based is the Big Bluestem/Switchgrass/Indiangrass/Little Bluestem Plant Community, which is considered to be climax. The climax plant community 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



FSD – Frequent severe defoliation; **LTPG** – Long-term prescribed grazing;
NU, NF – Non-use, no fire; **PB** – Prescribed burning; **PG** – Prescribed grazing
 (planned, controlled harvest of vegetation with grazing or browsing animals –
 see FOTG, Section IV, 528).

Plant Community Composition and Group Annual Production

COMMON/GROUP NAME	SCIENTIFIC NAME	SYMBOL	Big Bluestem/Switchgrass/ Indiangrass/Little Bluestem		
			Group	lbs./acre	% Comp
GRASSES & GRASS-LIKES				3840 - 4560	80 - 95
TALL/MID WARM-SEASON GRASSES			1	1440 - 2880	30 - 60
big bluestem	Andropogon gerardii	ANGE	1	960 - 2160	20 - 45
switchgrass	Panicum virgatum	PAVI2	1	240 - 720	5 - 15
Indiangrass	Sorghastrum nutans	SONU2	1	240 - 720	5 - 15
little bluestem	Schizachyrium scoparium	SCSC	1	96 - 480	2 - 10
prairie cordgrass	Spartina pectinata	SPPE	1	48 - 384	1 - 8
green muhly	Muhlenbergia racemosa	MURA	1	0 - 240	0 - 5
TALL/MID COOL-SEASON GRASSES			2	240 - 960	5 - 20
western wheatgrass	Pascopyrum smithii	PASM	2	96 - 720	2 - 15
slender wheatgrass	Elymus trachycaulus	ELTR7	2	48 - 384	1 - 8
Canada wildrye	Elymus canadensis	ELCA4	2	0 - 240	0 - 5
green needlegrass	Nassella viridula	NAVI4	2	0 - 144	0 - 3
OTHER NATIVE GRASSES			3	48 - 480	1 - 10
inland saltgrass	Distichlis spicata	DISP	3	48 - 240	1 - 5
foxtail barley	Hordeum jubatum	HOJU	3	0 - 240	0 - 5
fowl bluegrass	Poa palustris	POPA2	3	0 - 144	0 - 3
other perennial grasses		2GP	3	0 - 240	0 - 5
GRASS-LIKES			4	96 - 480	2 - 10
sedge	Carex spp.	CAREX	4	96 - 480	2 - 10
rush	Juncus spp.	JUNCU	4	0 - 144	0 - 3
spikerush	Eleocharis spp.	ELEOC	4	0 - 144	0 - 3
other grass-likes		2GL	4	0 - 240	0 - 5
FORBS			6	240 - 480	5 - 10
American licorice	Glycyrrhiza lepidota	GLLE3	6	0 - 144	0 - 3
arrowgrass	Triglochin palustre	TRPA6	6	0 - 48	0 - 1
cudweed sagewort	Artemisia ludoviciana	ARLU	6	48 - 96	1 - 2
false boneset	Brickellia eupatorioides	BREU	6	0 - 96	0 - 2
gayfeather	Liatris spp.	LIATR	6	48 - 96	1 - 2
goldenrod	Solidago spp.	SOLID	6	48 - 144	1 - 3
Maximilian sunflower	Helianthus maximiliani	HEMA2	6	48 - 192	1 - 4
Missouri goldenrod	Solidago missouriensis	SOMI2	6	0 - 48	0 - 1
Pennsylvania smartweed	Polygonum pensylvanicum	POPE2	6	0 - 48	0 - 1
prairie clover	Dalea spp.	DALEA	6	48 - 96	1 - 2
Pursh seepweed	Suaeda calceoliformis	SUCA2	6	0 - 48	0 - 1
Rocky Mountain iris	Iris missouriensis	IRMI	6	0 - 48	0 - 1
showy milkweed	Asclepias speciosa	ASSP	6	48 - 96	1 - 2
western ragweed	Ambrosia psilostachya	AMPS	6	0 - 48	0 - 1
white prairie aster	Symphotrichum falcatum	SYFA	6	48 - 96	1 - 2
wild strawberry	Fragaria virginiana	FRVI	6	0 - 48	0 - 1
native forbs		2FN	6	0 - 240	0 - 5
SHRUBS			7	240 - 480	5 - 10
false indigo	Amorpha fruticosa	AMFR	7	48 - 96	1 - 2
rose	Rosa spp.	ROSA5	7	0 - 96	0 - 2
silver buffaloberry	Shepherdia argentea	SHAR	7	0 - 192	0 - 4
western snowberry	Symphoricarpos occidentalis	SYOC	7	0 - 96	0 - 2
willow	Salix spp.	SALIX	7	48 - 384	1 - 8
other shrubs		2SHRUB	7	0 - 144	0 - 3

Annual Production lbs./acre	LOW	RV	HIGH
GRASSES & GRASS-LIKES	3590 -	4080	4460
FORBS	205 -	360	570
SHRUBS	205 -	360	570
TOTAL	4000 -	4800	5600

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	Big Bluestem/Switchgrass/ Indiangrass/Little Bluestem			Western Wheatgrass/Big Bluestem/Sedge/Bluegrass			Big Bluestem/Western Wheatgrass/Bluegrass/Sedge			Kentucky Bluegrass/ Sedge		
		Grp	lbs./acre	% Comp	Grp	lbs./acre	% Comp	Grp	lbs./acre	% Comp	Grp	lbs./acre	% Comp
GRASSES & GRASS-LIKES			3840 - 4560	80 - 95		3040 - 3420	80 - 90		3200 - 3600	80 - 90		2380 - 2660	85 - 95
TALL/MID WARM-SEASON		1	1440 - 2880	30 - 60	1	190 - 760	5 - 20	1	200 - 1200	5 - 30	1	0 - 140	0 - 5
big bluestem	ANGE	1	960 - 2160	20 - 45	1	190 - 760	5 - 20	1	200 - 1200	5 - 30	1	0 - 140	0 - 5
switchgrass	PAV12	1	240 - 720	5 - 15	1	0 - 190	0 - 5	1	0 - 200	0 - 5			
Indiangrass	SONU2	1	240 - 720	5 - 15	1	0 - 190	0 - 5	1	0 - 120	0 - 3			
little bluestem	SCSC	1	96 - 480	2 - 10	1	0 - 190	0 - 5	1	0 - 120	0 - 3	1	0 - 84	0 - 3
prairie cordgrass	SPPE	1	48 - 384	1 - 8	1	0 - 114	0 - 3	1	0 - 200	0 - 5			
green muhly	MURA	1	0 - 240	0 - 5									
TALL/MID COOL-SEASON		2	240 - 960	5 - 20	2	760 - 1520	20 - 40	2	600 - 1400	15 - 35	2	56 - 280	2 - 10
western wheatgrass	PASM	2	96 - 720	2 - 15	2	570 - 1330	15 - 35	2	400 - 1200	10 - 30	2	0 - 280	0 - 10
slender wheatgrass	ELTR7	2	48 - 384	1 - 8	2	76 - 380	2 - 10	2	80 - 400	2 - 10	2	0 - 56	0 - 2
Canada wildrye	ELCA4	2	0 - 240	0 - 5	2	0 - 114	0 - 3	2	0 - 120	0 - 3			
green needlegrass	NAV14	2	0 - 144	0 - 3	2	0 - 114	0 - 3	2	0 - 200	0 - 5			
OTHER NATIVE GRASSES		3	48 - 480	1 - 10	3	76 - 380	2 - 10	3	0 - 200	0 - 5	3	140 - 280	5 - 10
inland saltgrass	DISP	3	48 - 240	1 - 5	3	38 - 304	1 - 8	3	0 - 120	0 - 3	3	28 - 140	1 - 5
foxtail barley	HOJU	3	0 - 240	0 - 5	3	0 - 266	0 - 7	3	0 - 200	0 - 5	3	56 - 224	2 - 8
fowl bluegrass	POPA2	3	0 - 144	0 - 3	3	0 - 114	0 - 3	3	0 - 200	0 - 5	3	0 - 56	0 - 2
other grasses	#N/A	3	0 - 240	0 - 5	3	0 - 190	0 - 5	3	0 - 200	0 - 5	3	0 - 112	0 - 4
GRASS-LIKES		4	96 - 480	2 - 10	4	190 - 570	5 - 15	4	200 - 600	5 - 15	4	280 - 700	10 - 25
sedge	CAREX	4	96 - 480	2 - 10	4	190 - 570	5 - 15	4	200 - 600	5 - 15	4	280 - 700	10 - 25
rush	JUNCU	4	0 - 144	0 - 3	4	38 - 190	1 - 5	4	40 - 320	1 - 8	4	0 - 140	0 - 5
spikerush	ELEOC	4	0 - 144	0 - 3	4	0 - 114	0 - 3	4	0 - 200	0 - 5	4	0 - 140	0 - 5
other grass-likes	2GL	4	0 - 240	0 - 5	4	0 - 190	0 - 5	4	0 - 200	0 - 5	4	0 - 140	0 - 5
NON-NATIVE GRASSES		5			5	38 - 380	1 - 10	5	200 - 800	5 - 20	5	700 - 1540	25 - 55
Kentucky bluegrass	POPR				5	38 - 380	1 - 10	5	200 - 800	5 - 20	5	700 - 1540	25 - 55
smooth bromegrass	BRIN2				5	0 - 190	0 - 5	5	0 - 320	0 - 8	5	0 - 700	0 - 25
FORBS		6	240 - 480	5 - 10	6	190 - 570	5 - 15	6	200 - 400	5 - 10	6	140 - 280	5 - 10
American licorice	GLLE3	6	0 - 144	0 - 3	6	0 - 114	0 - 3	6	0 - 120	0 - 3			
arrowgrass	TRPA6	6	0 - 48	0 - 1	6	0 - 38	0 - 1	6	0 - 40	0 - 1			
cudweed sagewort	ARLU	6	48 - 96	1 - 2	6	38 - 190	1 - 5	6	40 - 160	1 - 4	6	28 - 140	1 - 5
false boneset	BREU	6	0 - 96	0 - 2	6	0 - 38	0 - 1	6	0 - 40	0 - 1			
gayfeather	LIATR	6	48 - 96	1 - 2	6	38 - 76	1 - 2	6	40 - 80	1 - 2	6	0 - 28	0 - 1
goldenrod	SOLID	6	48 - 144	1 - 3	6	38 - 304	1 - 8	6	40 - 160	1 - 4	6	28 - 140	1 - 5
Maximilian sunflower	HEMA2	6	48 - 192	1 - 4	6	0 - 76	0 - 2	6	0 - 80	0 - 2			
Missouri goldenrod	SOM12	6	0 - 48	0 - 1	6	38 - 76	1 - 2	6	40 - 80	1 - 2	6	0 - 28	0 - 1
Pennsylvania smartweed	POPE2	6	0 - 48	0 - 1	6	0 - 38	0 - 1	6	0 - 40	0 - 1			
prairie clover	DALEA	6	48 - 96	1 - 2	6	38 - 76	1 - 2	6	40 - 80	1 - 2	6	0 - 28	0 - 1
Pursh seepweed	SUCA2	6	0 - 48	0 - 1	6	0 - 38	0 - 1	6	0 - 40	0 - 1			
Rocky Mountain iris	IRMI	6	0 - 48	0 - 1	6	0 - 76	0 - 2	6	0 - 40	0 - 1	6	0 - 112	0 - 4
showy milkweed	ASSP	6	48 - 96	1 - 2	6	38 - 114	1 - 3	6	40 - 160	1 - 4	6	0 - 84	0 - 3
western ragweed	AMPS	6	0 - 48	0 - 1	6	38 - 190	1 - 5	6	40 - 120	1 - 3	6	28 - 140	1 - 5
white prairie aster	SYFA	6	48 - 96	1 - 2	6	38 - 190	1 - 5	6	40 - 120	1 - 3	6	0 - 56	0 - 2
wild strawberry	FRVI	6	0 - 48	0 - 1				6	0 - 40	0 - 1			
native forbs	2FN	6	0 - 240	0 - 5	6	0 - 304	0 - 8	6	0 - 200	0 - 5	6	0 - 84	0 - 3
introduced forbs	2FI				6	0 - 190	0 - 5	6	0 - 200	0 - 5	6	0 - 140	0 - 5
SHRUBS		7	240 - 480	5 - 10	7	38 - 190	1 - 5	7	200 - 400	5 - 10	7	28 - 140	1 - 5
false indigo	AMFR	7	48 - 96	1 - 2				7	0 - 80	0 - 2			
rose	ROSA5	7	0 - 96	0 - 2	7	38 - 114	1 - 3	7	40 - 120	1 - 3	7	28 - 56	1 - 2
silver buffaloberry	SHAR	7	0 - 192	0 - 4	7	0 - 38	0 - 1	7	0 - 160	0 - 4	7	0 - 56	0 - 2
western snowberry	SYOC	7	0 - 96	0 - 2	7	0 - 114	0 - 3	7	40 - 200	1 - 5	7	28 - 84	1 - 3
willow	SALIX	7	48 - 384	1 - 8	7	0 - 114	0 - 3	7	0 - 200	0 - 5	7	0 - 56	0 - 2
other shrubs	2SHRUB	7	0 - 144	0 - 3	7	0 - 76	0 - 2	7	0 - 120	0 - 3	7	0 - 56	0 - 2
Annual Production lbs./acre			LOW RV HIGH		LOW RV HIGH		LOW RV HIGH		LOW RV HIGH		LOW RV HIGH		LOW RV HIGH
GRASSES & GRASS-LIKES			3590 - 4080 - 4460		2800 - 3306 - 3700		2850 - 3400 - 3850		1850 - 2506 - 3125				
FORBS			205 - 360 - 570		165 - 380 - 685		175 - 300 - 475		125 - 210 - 320				
SHRUBS			205 - 360 - 570		35 - 114 - 215		175 - 300 - 475		25 - 84 - 155				
TOTAL			4000 - 4800 - 5600		3000 - 3800 - 4600		3200 - 4000 - 4800		2000 - 2800 - 3600				

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.

Big Bluestem/Switchgrass/Indiangrass/Little Bluestem Plant Community

Interpretations are based primarily on the Big Bluestem/Switchgrass/Indiangrass/Little Bluestem Plant Community (this is also considered to be climax). This plant community evolved with grazing by large herbivores and is well suited for grazing by domestic livestock and can be found on areas that are grazed and where the grazed plants receive adequate periods of rest during the growing season in order to recover. The potential vegetation is about 80-95 percent grasses and grass-likes, 5-10 percent forbs, and 5-10 percent shrubs.

Tall warm-season grasses dominate this community. The major grasses include big bluestem, switchgrass, Indiangrass, and little bluestem. Other grasses and grass-likes occurring on the community include western wheatgrass, prairie cordgrass, slender wheatgrass, and sedge. Key forbs include American licorice, goldenrod, Maximilian sunflower, prairie clover, and white prairie aster. Shrub species include willow, silver buffaloberry, and false indigo.

This plant community is diverse, stable, productive, and is well adapted to the Northern Great Plains. The high water table supplies much of the moisture for plant growth. 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 a high tolerance to a fluctuating water table. Runoff from adjacent sites and moderate or high available water capacity provides a favorable soil-water-plant relationship.

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: SD6310

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

Growth curve description: Warm-season dominant, lowland.

JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
0	0	2	8	15	21	26	15	8	5	0	0

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

- Frequent severe defoliation will move this plant community to the *Big Bluestem/Western Wheatgrass/Bluegrass/Sedge Plant Community*.
- Non-use and/or no fire will shift this plant community to the *Big Bluestem/Western Wheatgrass/Bluegrass/Sedge*.

Western Wheatgrass/Big Bluestem/Sedge/Bluegrass Plant Community

This plant community results from frequent and severe defoliation. The potential vegetation is about 80-90 percent grasses or grass-like plants, 5-15 percent forbs, and 1-5 percent woody plants. Western wheatgrass, big bluestem, sedge, and Kentucky bluegrass are the dominant species. Other grasses include slender wheatgrass, inland saltgrass, and foxtail barley. Forb species would include cudweed sagewort, goldenrod, showy milkweed, western ragweed, and white prairie aster. Compared to the Big Bluestem/Switchgrass/Indiangrass/Little Bluestem Plant Community, switchgrass, Indiangrass, little bluestem, and prairie cordgrass have decreased. Western wheatgrass, sedge, and Kentucky bluegrass have increased.

The soil remains stable. Water cycle, nutrient cycle, and energy flow is slightly reduced but continues to adequately function. Water table tends to rise closer to the surface, which favors an increase of rush and spikerush.

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: SD6008

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

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

JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
0	0	4	11	19	23	20	12	6	5	0	0

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

- Frequent severe defoliation will convert this plant community to the *Kentucky Bluegrass/Sedge Plant Community*.
- Prescribed grazing will convert this plant community to the *Big Bluestem/Switchgrass/Indiangrass/Little Bluestem Plant Community*.

Big Bluestem/Western Wheatgrass/Bluegrass/Sedge Plant Community

This plant community is the result of nonuse and/or no fire. This plant community is made up of 80-90 percent grass and grass-like species, 5-10 percent forbs, and 5-10 percent shrubs. Western wheatgrass, big bluestem, Kentucky bluegrass, and sedge are the dominant species. Other grasses and grass-likes include slender wheatgrass, smooth brome grass, and rush. Forb species would include cudweed sagewort, goldenrod, and showy milkweed. Common shrubs are rose and western snowberry.

Plant diversity and production have been reduced compared to the climax community. The soil remains stable. Water cycle, nutrient cycle, and energy flow is slightly reduced but continues to adequately function. Water table tends to rise closer to the surface, which favors an increase of rush and spikerush.

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: SD6008

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

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

JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
0	0	4	11	19	23	20	12	6	5	0	0

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

- Under prescribed grazing or prescribed burning, including adequate rest periods, this plant community will move towards the *Big Bluestem/Switchgrass/Indiangrass/Little Bluestem Plant Community*.

Kentucky Bluegrass/Sedge Plant Community

This plant community developed from frequent and severe defoliation. The plant community is predominantly cool-season grasses and grass-likes. Kentucky bluegrass has fully invaded the community and persists in a sod-bound condition. Sedge and foxtail barley have increased. Remnant amounts of western wheatgrass may still persist in localized colonies. Prairie cordgrass, Indiangrass, and switchgrass have been removed. Forbs such as cudweed sagewort, goldenrod, and western ragweed are common to this site.

This community remains stable but has lost much of its production and diversity. The nutrient cycle is impaired due to the loss of warm-season grass species, deep rooted forbs, and shrubs. Soil compaction can be a concern if continuously grazed during wet cycles. It will take a long time to bring this plant community back to the climax community with management alone. Renovation would be very costly.

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: SD6006

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

Growth curve description: Cool-season dominant, lowland.

JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
0	0	6	15	20	26	17	9	4	3	0	0

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

- Long-term prescribed grazing will move this plant community to the *Western Wheatgrass/Big Bluestem/Sedge/Bluegrass Plant Community* and will eventually return to the climax plant community, assuming an adequate seed/vegetative source is available. This process will require a long period of time and may be difficult to attain depending on the degree of degradation.

Ecological Site Interpretations

Animal Community – Wildlife Interpretations

-- Under Development --

Big Bluestem/Switchgrass/Indiangrass/Little Bluestem Plant Community:

Western Wheatgrass/Big Bluestem/Sedge/Bluegrass Plant Community:

Big Bluestem/Western Wheatgrass/Bluegrass/Sedge Plant Community:

Kentucky Bluegrass/Sedge Plant Community:

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

Common Name	Cattle	Sheep	Horses	Deer	Antelope	Bison	Elk
Grasses & Grass-like							
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
Canada wildrye	U D U U	N U N N	U D U U	N U N N	N U N N	U D U U	U D U U
fowl bluegrass	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 U N
foxtail barley	U D N N	N P N N	U D N N	N P N N	N P N N	U D N N	U D N N
green muhly	U D D U	N U N N	U D D U	N U N N	N U N N	U D D U	U D 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
Indiangrass	U D P D	U D U U	U D P D	U D U U	U D U U	U D P D	U D P D
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
prairie cordgrass	U D D U	N N N N	U D D U	N N N N	N N N N	U D D U	U D D U
rush	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
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
slender wheatgrass	U P U U	N D U N	U P U U	N D U N	N D U N	U P U U	U P U U
spikerush	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
switchgrass	U D D U	U D U U	U D D U	N N N N	N N N N	U D D U	U D D U
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 licorice	U U D U	N U U N	U U D U	N U U N	N U U N	U U D U	N U U N
arrowgrass	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
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
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
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
Maximilian 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
Missouri 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
Pennsylvania smartweed	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
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
Pursh seepweed	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
Rocky Mountain iris	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
showy milkweed	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
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
white prairie aster	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
wild strawberry	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							
false indigo	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 U N
rose	U D D U	U D D U	U D D U	U D D U	U D D U	U D D U	U D D U
silver buffaloberry	D U U U	D U U U	D U U U	P U D P	U U U U	D U U U	D U U U
western snowberry	U U U U	U U U U	U U U U	D U D D	U U U U	U U U U	D U U U
willow	P U D P	P U D P	P U D P	P U D P	U U U U	P U D P	P U D P

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)
Big Bluestem/Switchgrass/Indiangrass/Little Bluestem	4800	1.32
Western Wheatgrass/Big Bluestem/Sedge/Bluegrass	3800	1.04
Big Bluestem/Western Wheatgrass/Bluegrass/Sedge	4000	1.10
Kentucky Bluegrass/Sedge	2800	0.77

*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.

Hydrology Functions

Water is the principal factor limiting forage production on this site. This site is dominated by soils in hydrologic group B. Infiltration varies from moderately rapid to moderate and runoff potential varies from negligible to very 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 shortgrasses 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, hiking, photography, bird watching, and other opportunities. The wide varieties of plants that bloom from spring until fall have an aesthetic 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

(R063AY002SD) – Wet Land (R063AY020SD) – Loamy Overflow
(R063AY021SD) – Clayey Overflow (R063AY007SD) – Saline Lowland

Similar Sites

(R063AY002SD) – Wet Land [higher production; more frequent ponding and higher water table]

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. No SCS-RANGE-417 clipping data collection forms have been recorded for this site.

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 Description Approval

SD, State Range Management Specialist

Date