

United States Department of Agriculture Natural Resources Conservation Service

Ecological Site Description

Site Type: Rangeland

Site Name: Clayey Overflow

Site ID: R063AY021SD

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



Physiographic Features

This site occurs on nearly level areas that receive additional water from overflow of intermittent streams or runoff from adjacent slopes.

Landform: alluvial fan, flood plain, stream terrace **Aspect:** N/A

	<u>Minimum</u>	<u>Maximum</u>
Elevation (feet):	1600	2700
Slope (percent):	0	2
Water Table Depth (inches):	42	80
Flooding:		
Frequency:	Occasional	Frequent
Duration:	Brief	Brief
Ponding:		
Depth (inches):	None	None
Frequency:	None	None
Duration:	None	None
Runoff Class:	Medium	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

Stream Type: B6, C6
 (Rosgen System)

Representative Soil Features

The soils in this site are moderately well to well drained and formed in alluvium. The silty clay loam to clay surface layer is 5-11 inches thick. The soils have a slow infiltration rate. This site typically should show no evidence of rills, wind scoured areas, or pedestalled plants. If present, water flow paths are broken, irregular in appearance, or discontinuous. The soil surface is stable and intact.

These soils are mainly susceptible to water erosion. The hazard of water erosion increases where vegetative cover is not adequate. A drastic loss of soil surface layer 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: alluvium
Parent Material Origin: shale, calcareous
Surface Texture: silty clay, clay, silty clay loam
Surface Texture Modifier: none
Subsurface Texture Group: clayey
Surface Fragments ≤3” (% Cover): 0-5
Surface Fragments >3” (%Cover): 0
Subsurface Fragments ≤3” (% Volume): 0-5
Subsurface Fragments >3” (% Volume): 0

	<u>Minimum</u>	<u>Maximum</u>
Drainage Class:	moderately well	well
Permeability Class:	slow	slow
Depth (inches):	80	80
Electrical Conductivity (mmhos/cm)*:	0	4
Sodium Absorption Ratio*:	0	1
Soil Reaction (1:1 Water)*:	7.4	8.4
Soil Reaction (0.1M CaCl2)*:	5	8
Calcium Carbonate Equivalent (percent)*:	0	15

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

Plant Communities

Ecological Dynamics of the Site:

This site developed under Northern Great Plains climatic conditions, 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, species such as blue grama will increase, and introduced species such as Kentucky bluegrass and Canada thistle will invade the site. Grasses such as slender wheatgrass, green needlegrass, big bluestem, rhizomatous wheatgrasses, prairie cordgrass, and switchgrass will decrease.

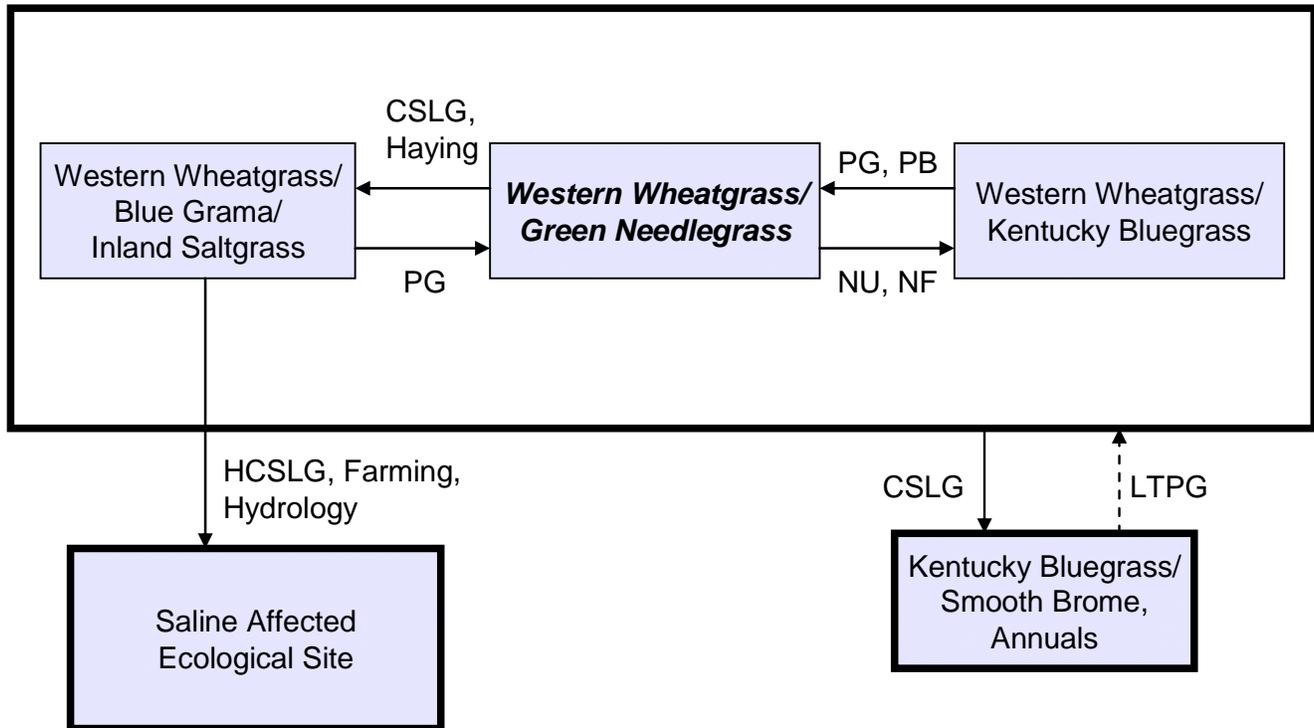
Continuous season-long grazing (during the typical growing season of May through October) and/or repeated seasonal grazing (e.g., every spring, every summer) without adequate recovery periods following each grazing occurrence causes this site to depart from the Western Wheatgrass/Green Needlegrass Plant Community. Western wheatgrass increases initially and will eventually decrease with continuous grazing. Grasses such as green needlegrass, big bluestem, and switchgrass will decrease in frequency and production. Where trees dominate the site, woody regeneration will decline and grasses and forbs will become dominant in the understory.

Interpretations are primarily based on the Western Wheatgrass/Green Needlegrass 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 is a diagram that illustrates the common plant communities that can occur on the site and the transition pathways between communities. The ecological processes will be discussed in more detail in the plant community descriptions following the diagram.

Plant Communities and Transitional Pathways



CSLG - Continuous season-long grazing (grazing a unit for an entire growing season); **Farming** – Farming on adjacent landscapes causing increased salts/salinity in the lower positions; **HCSLG** – Heavy continuous season-long grazing; **Hydrology** – Grazing induced hydrologic changes causing increased salt accumulation, or construction of water impoundments; **LTPG** - Long-term prescribed grazing; **NF** - No fire; **NU** - Non use; **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	Western Wheatgrass/ Green Needlegrass			
			Group	lbs./acre	% Comp	
GRASSES & GRASS-LIKES				2400 - 2700	80 - 90	
WHEATGRASS			1	750 - 1500	25 - 50	
western wheatgrass	Pascopyrum smithii	PASM	1	600 - 1500	20 - 50	
slender wheatgrass	Elymus trachycaulus	ELTR7	1	150 - 600	5 - 20	
COOL-SEASON BUNCHGRASSES			2	150 - 750	5 - 25	
green needlegrass	Nassella viridula	NAV4	2	150 - 600	5 - 20	
Canada wildrye	Elymus canadensis	ELCA4	2	0 - 450	0 - 15	
TALL/MID WARM-SEASON GRASSES			3	150 - 300	5 - 10	
big bluestem	Andropogon gerardii	ANGE	3	0 - 150	0 - 5	
tall dropseed	Sporobolus compositus var. compositus	SPCOC2	3	0 - 150	0 - 5	
green muhly	Muhlenbergia racemosa	MURA	3	0 - 150	0 - 5	
sideoats grama	Bouteloua curtipendula	BOCU	3	30 - 150	1 - 5	
prairie cordgrass	Spartina pectinata	SPPE	3	0 - 150	0 - 5	
switchgrass	Panicum virgatum	PAV12	3	0 - 60	0 - 2	
SHORT WARM-SEASON GRASSES			4	60 - 240	2 - 8	
blue grama	Bouteloua gracilis	BOGR2	4	0 - 150	0 - 5	
buffalograss	Bouteloua dactyloides	BODA2	4	0 - 150	0 - 5	
inland saltgrass	Distichlis spicata	DISP	4	0 - 150	0 - 5	
mat muhly	Muhlenbergia richardsonis	MURI	4	0 - 90	0 - 3	
OTHER NATIVE GRASSES			5	30 - 150	1 - 5	
foxtail barley	Hordeum jubatum	HOJU	5	0 - 90	0 - 3	
Scribner panicum	Dichanthelium oligosanthes var. scribnerianum	DIOLS	5	0 - 30	0 - 1	
other grasses		2GRAM	6	0 - 90	0 - 3	
GRASS-LIKES			5	150 - 300	5 - 10	
sedge	Carex spp.	CAREX	6	60 - 300	2 - 10	
rush	Juncus spp.	JUNCU	6	0 - 60	0 - 2	
spikerush	Eleocharis spp.	ELEOC	6	0 - 30	0 - 1	
other grass-like		2GL	6	0 - 90	0 - 3	
FORBS			8	150 - 300	5 - 10	
American licorice	Glycyrrhiza lepidota	GLLE3	8	30 - 90	1 - 3	
American vetch	Vicia americana	VIAM	8	30 - 60	1 - 2	
cudweed sagewort	Artemisia ludoviciana	ARLU	8	30 - 90	1 - 3	
curlycup gumweed	Grindelia squarrosa	GRSQ	8	0 - 90	0 - 3	
false boneset	Brickellia eupatorioides	BREU	8	0 - 60	0 - 2	
goldenrod	Solidago spp.	SOLID	8	30 - 60	1 - 2	
green sagewort	Artemisia campestris	ARCA12	8	0 - 60	0 - 2	
groundsel	Senecio spp.	SENEC	8	0 - 30	0 - 1	
heath aster	Symphotrichum ericoides	SYER	8	30 - 90	1 - 3	
Indianhemp	Apocynum cannabinum	APCA	8	0 - 60	0 - 2	
Maximilian sunflower	Helianthus maximiliani	HEMA2	8	0 - 60	0 - 2	
mint	Mentha spp.	MENTH	8	0 - 30	0 - 1	
prairie coneflower	Ratibida columnifera	RACO3	8	30 - 60	1 - 2	
scarlet gaura	Gaura coccinea	GACO5	8	30 - 60	1 - 2	
scurfpea	Psoralegium spp.	PSORA2	8	30 - 60	1 - 2	
showy milkweed	Asclepias speciosa	ASSP	8	30 - 60	1 - 2	
stickseed	Hackelia spp.	HACKE	8	0 - 30	0 - 1	
thistle	Cirsium spp.	CIRSI	8	30 - 60	1 - 2	
western ragweed	Ambrosia psilostachya	AMPS	8	30 - 60	1 - 2	
western yarrow	Achillea millefolium var. occidentalis	ACMIO	8	30 - 90	1 - 3	
native forbs		2FN	8	30 - 150	1 - 5	
SHRUBS			9	30 - 300	1 - 10	
American plum	Prunus americana	PRAM	9	0 - 90	0 - 3	
broom snakeweed	Gutierrezia sarothrae	GUSA2	9	0 - 30	0 - 1	
cactus	Opuntia spp.	OPUNT	9	0 - 30	0 - 1	
chokecherry	Prunus virginiana	PRVI	9	0 - 60	0 - 2	
desert false indigo	Amorpha fruticosa	AMFR	9	0 - 30	0 - 1	
fringed sagewort	Artemisia frigida	ARFR4	9	0 - 60	0 - 2	
rose	Rosa spp.	ROSA5	9	30 - 150	1 - 5	
sandbar willow	Salix interior	SAIN3	9	30 - 150	1 - 5	
silver sagebrush	Artemisia cana	ARCA13	9	0 - 90	0 - 3	
snowberry	Symphoricarpos spp.	SYMPH	9	30 - 150	1 - 5	
other shrubs		2SHRUB	9	0 - 150	0 - 5	
TREES			10	0 - 30	0 - 1	
American elm	Ulmus americana	ULAM	10	0 - 30	0 - 1	
green ash	Fraxinus pennsylvanica	FRPE	10	0 - 30	0 - 1	
plains cottonwood	Populus deltoides ssp. monilifera	PODEM	10	0 - 30	0 - 1	
willow	Salix spp.	SALIX	10	0 - 30	0 - 1	
other trees		2TREE	10	0 - 30	0 - 1	
Annual Production lbs./acre				LOW	RV	HIGH
GRASSES & GRASS-LIKES				2040 -	2595 -	3275
FORBS				135 -	225 -	345
SHRUBS				25 -	165 -	345
TREES				0 -	15 -	35
TOTAL				2200 -	3000 -	4000

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/ Green Needlegrass			Western Wheatgrass/Blue Grass/Inland Saltgrass			Western Wheatgrass/ Kentucky Bluegrass			Kentucky Bluegrass/ Smooth Brome, Annuals			
		Grp	lbs./acre	% Comp	Grp	lbs./acre	% Comp	Grp	lbs./acre	% Comp	Grp	lbs./acre	% Comp	
GRASSES & GRASS-LIKES			2400 - 2700	80 - 90		1350 - 1620	75 - 90		1680 - 2160	70 - 90		1300 - 1600	65 - 80	
WHEATGRASS		1	750 - 1500	25 - 50	1	180 - 630	10 - 35	1	360 - 840	15 - 35	1	0 - 100	0 - 5	
western wheatgrass	PASM	1	600 - 1500	20 - 50	1	180 - 630	10 - 35	1	360 - 840	15 - 35	1	0 - 100	0 - 5	
slender wheatgrass	ELTR7	1	150 - 600	5 - 20	1	0 - 90	0 - 5	1	0 - 120	0 - 5				
COOL-SEASON BUNCHGRASSES		2	150 - 750	5 - 25	2	0 - 90	0 - 5	2	48 - 240	2 - 10	2			
green needlegrass	NAVI4	2	150 - 600	5 - 20	2	0 - 90	0 - 5	2	24 - 240	1 - 10				
Canada wildrye	ELCA4	2	0 - 450	0 - 15				2	0 - 120	0 - 5				
TALL/NO WARM-SEASON		3	150 - 300	5 - 10	3	0 - 54	0 - 3	3	24 - 144	1 - 6	3			
big bluestem	ANGE	3	0 - 150	0 - 5	3	0 - 18	0 - 1	3	0 - 24	0 - 1				
tall dropseed	SPCOC2	3	0 - 150	0 - 5	3	0 - 54	0 - 3	3	0 - 120	0 - 5				
green muhly	MURA	3	0 - 150	0 - 5				3	0 - 48	0 - 2				
sideoats grama	BOCU	3	30 - 150	1 - 5	3	0 - 36	0 - 2	3	0 - 24	0 - 1				
prairie cordgrass	SPPE	3	0 - 150	0 - 5				3	0 - 48	0 - 2				
switchgrass	PAV2	3	0 - 60	0 - 2				3	0 - 24	0 - 1				
SHORT WARM-SEASON GRASSES		4	60 - 240	2 - 8	4	270 - 630	15 - 35	4	24 - 144	1 - 6	4	40 - 240	2 - 12	
blue grama	BOGR2	4	0 - 150	0 - 5	4	90 - 450	5 - 25	4	0 - 120	0 - 5	4	0 - 160	0 - 8	
buffalograss	BODA2	4	0 - 150	0 - 5	4	0 - 180	0 - 10	4	0 - 120	0 - 5	4	0 - 100	0 - 5	
inland saltgrass	DISP	4	0 - 150	0 - 5	4	90 - 450	5 - 25	4	0 - 48	0 - 2	4	0 - 160	0 - 8	
mat muhly	MURI	4	0 - 90	0 - 3	4	18 - 90	1 - 5	4	0 - 48	0 - 2	4	0 - 100	0 - 5	
OTHER NATIVE GRASSES		5	30 - 150	1 - 5	5	36 - 216	2 - 12	5	24 - 120	1 - 5	5	20 - 200	1 - 10	
foxtail barley	HOJU	5	0 - 90	0 - 3	5	18 - 180	1 - 10	5	24 - 120	1 - 5	5	20 - 200	1 - 10	
Scribner panicum	DIOLS	5	0 - 30	0 - 1	5	0 - 18	0 - 1	5	0 - 24	0 - 1				
other grasses	2GRAM	5	0 - 90	0 - 3	5	0 - 90	0 - 5	5	0 - 120	0 - 5	5	0 - 100	0 - 5	
GRASS-LIKES		6	150 - 300	5 - 10	6	18 - 90	1 - 5	6	120 - 240	5 - 10	6	20 - 100	1 - 5	
sedge	CAREX	6	60 - 300	2 - 10	6	0 - 90	0 - 5	6	48 - 240	2 - 10	6	0 - 100	0 - 5	
rush	JUNCU	6	0 - 60	0 - 2	6	0 - 90	0 - 5	6	0 - 120	0 - 5	6	0 - 100	0 - 5	
spikerush	ELEOC	6	0 - 30	0 - 1	6	0 - 90	0 - 5	6	0 - 72	0 - 3	6	0 - 100	0 - 5	
other grass-likes	2GL	6	0 - 90	0 - 3	6	0 - 54	0 - 3	6	0 - 72	0 - 3	6	0 - 60	0 - 3	
NON-NATIVE GRASSES		7			7	0 - 90	0 - 5	7	240 - 720	10 - 30	7	600 - 1000	30 - 50	
bluegrass	POA	7			7	0 - 90	0 - 5	7	120 - 480	5 - 20	7	400 - 800	20 - 40	
cheatgrass	BRTE				7	0 - 90	0 - 5	7	24 - 240	1 - 10	7	100 - 300	5 - 15	
smooth bromegrass	BRIN2				7	0 - 54	0 - 3	7	48 - 288	2 - 12	7	200 - 400	10 - 20	
FORBS		8	150 - 300	5 - 10	8	90 - 270	5 - 15	8	120 - 360	5 - 15	8	200 - 400	10 - 20	
American licorice	GLLE3	8	30 - 90	1 - 3	8	0 - 54	0 - 3	8	24 - 120	1 - 5	8	20 - 80	1 - 4	
American vetch	VIAM	8	30 - 60	1 - 2				8	0 - 24	0 - 1				
burdock	ARCTI				8	0 - 36	0 - 2	8	0 - 72	0 - 3	8	0 - 100	0 - 5	
cudweed sagewort	ARLU	8	30 - 90	1 - 3	8	18 - 90	1 - 5	8	24 - 72	1 - 3	8	20 - 120	1 - 6	
curly dock	RUCR				8	0 - 36	0 - 2	8	0 - 72	0 - 3	8	0 - 60	0 - 3	
curlycup gumweed	GRSQ	8	0 - 90	0 - 3	8	18 - 90	1 - 5	8	0 - 48	0 - 2	8	0 - 60	0 - 3	
false boneset	BREU	8	0 - 60	0 - 2										
goldenrod	SOLID	8	30 - 60	1 - 2	8	18 - 54	1 - 3	8	24 - 72	1 - 3	8	20 - 40	1 - 2	
green sagewort	ARCA12	8	0 - 60	0 - 2	8	0 - 54	0 - 3	8	0 - 48	0 - 2	8	0 - 40	0 - 2	
groundsel	SENEC	8	0 - 30	0 - 1				8	0 - 24	0 - 1				
heath aster	SYER	8	30 - 90	1 - 3	8	18 - 54	1 - 3	8	24 - 72	1 - 3	8	20 - 60	1 - 3	
Indianhemp	APCA	8	0 - 60	0 - 2	8	0 - 36	0 - 2	8	0 - 72	0 - 3	8	0 - 80	0 - 4	
Maximilian sunflower	HEMA2	8	0 - 60	0 - 2				8	0 - 24	0 - 1				
mint	MENTH	8	0 - 30	0 - 1				8	0 - 24	0 - 1				
nettle	URTIC							8	0 - 72	0 - 3	8	0 - 100	0 - 5	
prairie coneflower	RACO3	8	30 - 60	1 - 2	8	0 - 18	0 - 1							
scarlet gaura	GACO5	8	30 - 60	1 - 2										
scurfpea	PSORA2	8	30 - 60	1 - 2	8	18 - 72	1 - 4	8	24 - 72	1 - 3	8	0 - 40	0 - 2	
showy milkweed	ASSP	8	30 - 60	1 - 2	8	18 - 54	1 - 3	8	24 - 72	1 - 3	8	20 - 60	1 - 3	
stickseed	HACKE	8	0 - 30	0 - 1										
thistle	CIRSI	8	30 - 60	1 - 2	8	18 - 54	1 - 3	8	24 - 72	1 - 3	8	0 - 40	0 - 2	
western ragweed	AMPS	8	30 - 60	1 - 2	8	18 - 90	1 - 5	8	24 - 72	1 - 3	8	20 - 80	1 - 4	
western yarrow	ACMIO	8	30 - 90	1 - 3	8	36 - 126	2 - 7	8	24 - 96	1 - 4	8	40 - 160	2 - 8	
native forbs	2FN	8	30 - 150	1 - 5	8	18 - 90	1 - 5	8	24 - 120	1 - 5	8	0 - 80	0 - 4	
introduced forbs	2FI				8	0 - 90	0 - 5	8	24 - 192	1 - 8	8	20 - 200	1 - 10	
SHRUBS		9	30 - 300	1 - 10	9	36 - 180	2 - 10	9	120 - 288	5 - 12	9	100 - 300	5 - 15	
American plum	PRAM	9	0 - 90	0 - 3	9	0 - 54	0 - 3	9	24 - 96	1 - 4	9	0 - 40	0 - 2	
broom snakeweed	GUSA2	9	0 - 30	0 - 1	9	18 - 72	1 - 4				9	0 - 60	0 - 3	
cactus	OPUNT	9	0 - 30	0 - 1	9	0 - 36	0 - 2	9	0 - 24	0 - 1	9	0 - 40	0 - 2	
chokecherry	PRVI	9	0 - 60	0 - 2				9	0 - 72	0 - 3	9	0 - 20	0 - 1	
desert false indigo	AMFR	9	0 - 30	0 - 1				9	0 - 48	0 - 2	9	0 - 20	0 - 1	
fringed sagewort	ARFR4	9	0 - 60	0 - 2	9	0 - 54	0 - 3	9	0 - 24	0 - 1	9	0 - 40	0 - 2	
rose	ROSA5	9	30 - 150	1 - 5	9	18 - 72	1 - 4	9	24 - 96	1 - 4	9	20 - 100	1 - 5	
sandbar willow	SAIN3	9	30 - 150	1 - 5	9	0 - 18	0 - 1	9	24 - 120	1 - 5	9	0 - 40	0 - 2	
silver sagebrush	ARCA13	9	0 - 90	0 - 3	9	0 - 72	0 - 4	9	0 - 48	0 - 2	9	0 - 60	0 - 3	
snowberry	SYMPH	9	30 - 150	1 - 5	9	18 - 126	1 - 7	9	48 - 240	2 - 10	9	40 - 240	2 - 12	
other shrubs	2SHRUB	9	0 - 150	0 - 5	9	0 - 54	0 - 3	9	0 - 96	0 - 4	9	0 - 60	0 - 3	
TREES		10	0 - 30	0 - 1	10	0 - 18	0 - 1	10	0 - 24	0 - 1	10	0 - 20	0 - 1	
American elm	ULAM	10	0 - 30	0 - 1	10	0 - 18	0 - 1	10	0 - 24	0 - 1	10	0 - 20	0 - 1	
green ash	FRPE	10	0 - 30	0 - 1	10	0 - 18	0 - 1	10	0 - 24	0 - 1	10	0 - 20	0 - 1	
plains cottonwood	PODEM	10	0 - 30	0 - 1	10	0 - 18	0 - 1	10	0 - 24	0 - 1	10	0 - 20	0 - 1	
willow	SALIX	10	0 - 30	0 - 1	10	0 - 18	0 - 1	10	0 - 24	0 - 1	10	0 - 20	0 - 1	
other trees	2TREE	10	0 - 30	0 - 1	10	0 - 18	0 - 1	10	0 - 24	0 - 1	10	0 - 20	0 - 1	
Annual Production lbs./acre			LOW	RV	HIGH	LOW	RV	HIGH	LOW	RV	HIGH	LOW	RV	HIGH
GRASSES & GRASS-LIKES			2030 - 2595	-	3315	1080 - 1503	-	1895	1370 - 1944	-	2500	1110 - 1490	-	2025
FORBS			145 - 225	-	325	85 - 180	-	300	115 - 240	-	375	195 - 300	-	425
SHRUBS			25 - 165	-	325	35 - 108	-	185	115 - 204	-	300	95 - 200	-	325
TREES			0 - 15	-	35	0 - 9	-	20	0 - 12	-	25	0 - 10	-	25
TOTAL			2200 - 3000	-	4000	1200 - 1800	-	2400	1600 - 2400	-	3200	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. 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/Green Needlegrass Plant Community

Interpretations are based primarily on the Western Wheatgrass/Green Needlegrass Plant Community (this is also considered to be climax). The potential vegetation is about 80 percent grasses or grass-like plants, 10 percent forbs, and 10 percent woody plants. The community is dominated by cool-season grasses.

The major grasses include western wheatgrass and green needlegrass. Other prominent grasses and grass-likes include slender wheatgrass, big bluestem, sideoats grama, blue grama, buffalograss, tall dropseed, and sedges. Forbs consist of American licorice, heath aster, western yarrow, and cudweed sagewort. Woody species found on this site are American plum, rose, and snowberry.

This plant community is productive and diverse. The diversity in plant species allows for high drought tolerance. This is a sustainable plant community in regards to site/soil stability, watershed function, and biologic integrity.

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

Growth curve number: SD6301

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

Growth curve description: Cool-season dominant.

JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
0	0	4	12	25	36	10	5	4	4	0	0

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

- Continuous season-long grazing and/or haying will convert the plant community to the *Western Wheatgrass/ Blue Grama/Inland Saltgrass Plant Community*.
- Nonuse and no fire will shift plant community towards the *Western Wheatgrass/Kentucky Bluegrass Plant Community*.

Western Wheatgrass/Blue Grama/Inland Saltgrass Plant Community

This plant community is the result of continuous season-long grazing and/or from haying the same area over many years. The potential plant community is made up of approximately 80 percent grasses and grass-like species, 10 percent forbs, and 5 percent shrubs. Western wheatgrass and short warm-season grasses such as blue grama, buffalograss, and inland saltgrass dominate the site. These grasses can form a sod, limiting production for haying and grazing. Grasses of grass-like plants of secondary importance include green needlegrass, slender wheatgrass, and sedges.

Significant forbs found on this site include American licorice, cudweed sagewort, heath aster, scarlet gaura, scarlet globemallow, and western yarrow.

A significant amount of production and diversity has been lost when compared to the Western Wheatgrass/Green Needlegrass Plant Community. Blue grama, inland Saltgrass, and buffalograss have increased, while the production of mid and tall warm-season grasses has reduced. Green needlegrass and western wheatgrass have decreased significantly.

This plant community is moderately resistant to change, due to grazing tolerance of blue grama and buffalograss. 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 season-long grazing, farming, or effects from hydrology will convert this plant community to the *Saline Affected Ecological Site*.
- Prescribed grazing and proper stocking will eventually return this plant community to the *Western Wheatgrass/Green Needlegrass Plant Community*.

Western Wheatgrass/Kentucky Bluegrass Plant Community

This plant community evolved from nonuse and/or no fire. The potential plant community is made up of approximately 80 percent grasses and grass-like species, 10 percent forbs, and 5 percent shrubs. Western wheatgrass and Kentucky Bluegrass dominate the community. Grasses of secondary importance include blue grama, buffalograss, inland saltgrass, and foxtail barley. Forbs commonly found in this plant community include goldenrod, heath aster, western yarrow, western ragweed, and cudweed sagewort. Dominant shrubs include rose and snowberry. When compared to the Western Wheatgrass/Green Needlegrass Plant Community, green needlegrass is significantly reduced and there is an increase in nonnative grasses. Western yarrow, scurfpea, ragweed, and goldenrod have increased. Nonnative grasses and forbs such as annual bromes, curlycup gumweed, thistle, and cocklebur will invade this plant community.

This vegetation state is very resistant to change due to low plant diversity and competition of the invaded species. A significant amount of production and diversity has been lost when compared to the climax community. The loss of desirable species has negatively impacted energy flow and nutrient cycling. It will take a very long time to restore this plant community back to the climax community with improved management. Renovation could be very costly.

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: SD6301

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

Growth curve description: Cool-season dominant.

JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
0	0	4	12	25	36	10	5	4	4	0	0

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

- Continuous season-long grazing will likely move this plant community to the *Kentucky Bluegrass/Smooth Brome, Annuals Plant Community*.
- Prescribed grazing and/or prescribed burning may convert the plant community to the climax *Western Wheatgrass/Green Needlegrass Plant Community* or to the associated successional plant community stages assuming an adequate seed/vegetative source is available.

Kentucky Bluegrass/Smooth Brome, Annuals Plant Community

This plant community developed under continuous heavy grazing. The potential plant community is made up of approximately 80 percent grasses and grass-like species, 10 percent forbs, and 5 percent shrubs. The dominant grasses include Kentucky bluegrass and smooth brome. Other grasses may include western wheatgrass, foxtail barley, and sedge. The dominant forbs include goldenrod, heath aster, prairie coneflower, scurpea, thistle, and other annual invader-like species. The dominant shrubs include rose, silver sagebrush, and snowberry. This plant community is susceptible to invasion of Canada thistle and other nonnative species. Compared to the Western Wheatgrass/Green Needlegrass Plant Community, western wheatgrass, needlegrasses, and other cool-season grasses and grass-like species have decreased as have the warm-season species including big bluestem, sideoats grama, blue grama, and buffalograss.

This plant community is difficult to return to the Western Wheatgrass/Green Needlegrass Plant Community because of the loss of plant diversity. This plant community will require significant economic inputs and time to move towards another plant community. This movement is highly variable in its succession. This is due to the loss of diversity (including the loss of the seed bank), within the existing plant community, and the plant communities on adjacent sites.

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: SD6301

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

Growth curve description: Cool-season dominant.

JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
0	0	4	12	25	36	10	5	4	4	0	0

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

- Under long-term prescribed grazing, including adequate rest periods, this plant community will move through the successional stages eventually leading to the *Western Wheatgrass/Green Needlegrass Plant Community*. Depending on the slope, aspect, and size, and if adequate perennial plants exist, this change can occur more rapidly.

Saline Affected Ecological Site

Clayey Overflow sites that are in association with Dense Clay and Thin Claypan sites with slickspots, tend to create inclusions of a transitional plant community. The higher salt levels in the soils create a plant community that combines characteristics of both Saline Lowland and Clayey Overflow sites. Inland saltgrass and western wheatgrass dominate the site, but species such as Canada wildrye and bluegrass will also be present. Silver sagebrush is a shrub of significance.

Ecological Site Interpretations

Animal Community – Wildlife Interpretations

-- Under Development --

Western Wheatgrass/Green Needlegrass Plant Community:

Western Wheatgrass/Blue Grama/Inland Saltgrass Plant Community:

Western Wheatgrass/Kentucky Bluegrass Plant Community:

Kentucky Bluegrass/Smooth Brome, Annuals Plant Community:

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

Common Name	Cattle	Sheep	Horses	Deer	Antelope	Bison	Elk
Grasses & Grass-likes							
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
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
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
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
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
tall 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 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
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
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
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
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
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
mat muhly	N U U N	U U D U	N U U N	U U U U	U U U U	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
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
Scribner panicum	U U D U	N U N N	U U D U	N U N N	N U N N	U U D U	U U D U
Sandberg bluegrass	N U N N	N D N N	N U N N	N D N N	N D N N	N U N N	N U N N
tumblegrass	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
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
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
American vetch	U D P U	U P P U	U D P U	U P P U	U P P U	U D P U	U P P U
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
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
groundsel	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
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
Indianhemp	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
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
mint	N N U N	N U U N	N N U N	N U U N	N U U N	N N U N	N U U N
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
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
showy milkweed	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
stickseed	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
thistle	U U U U	N N N N	U U U U	N N N N	N N N N	U U U U	N N N N
western ragweed	U U U U	N N N N	U U U U	N N N N	N N N N	U U U U	N N N N
western 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
Shrubs							
American plum	D U U D	D U U D	D U U D	P U D D	D U U D	D U U D	D U U D
broom snakeweed	N N N N	U U U U	N N N N	U U U U	U U U U	N N N N	U U U U
cactus	N N N N	N N N N	N N N N	N N N N	N N N N	N N N N	N N N N
chokecherry	D T T D	D T T D	D T T D	P U D P	D U U D	D T T D	P U U P
desert 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
rose	U D D U	U D D U	U D D U	U D D U	U D D U	U D D U	U D D U
silver sagebrush	D U U D	D U U D	D U U D	P D D P	P P P P	D U U D	D U U D
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
Trees							
American elm	N N N N	N N N N	N N N N	N U D N	N N N N	N N N N	N N N N
green ash	N U D U	N D D U	N U D U	N D D U	N U D U	N U D U	N D D U
plains cottonwood	D U U D	D U U D	D U U D	D U D D	D U U D	D U U 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)
Western Wheatgrass/Green Needlegrass	3000	0.82
Western Wheatgrass/Blue Grama/Inland Saltgrass	2200	0.60
Western Wheatgrass/Kentucky Bluegrass	2400	0.66
Kentucky Bluegrass/Smooth Brome, Annuals	3000	0.82

*Based on 912 lbs./acre (air-dry weight) per Animal Unit Month (AUM), and on 30 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 groups C and D. Infiltration and runoff potential for this site varies from moderate to high 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. 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

Clayey (R063AY011SD), Thin Claypan (R063AY015SD), Dense Clay (R063AY018SD)

Similar Sites

(R063AY011SD) – Clayey [more big bluestem; less production]
(R063AY010SD) – Loamy [less green needlegrass; more needleandthread]

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 Description Approval

SD, State Range Management Specialist

Date