

United States Department of Agriculture Natural Resources Conservation Service

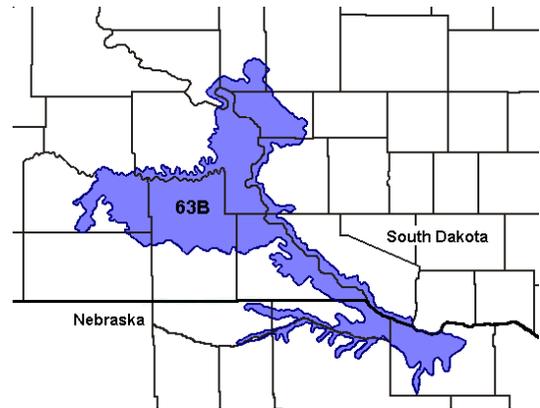
Ecological Site Description

Site Type: Rangeland

Site Name: Dense Clay

Site ID: R063BY018SD

Major Land Resource Area: 63B – Southern Rolling Pierre Shale Plains



Physiographic Features

This site occurs on nearly level to gently sloping uplands.

Landform: alluvial fan, plain, hill

Aspect: N/A

	<u>Minimum</u>	<u>Maximum</u>
Elevation (feet):	1300	2000
Slope (percent):	2	9
Water Table Depth (inches):	None	None
Flooding:		
Frequency:	None	Rare
Duration:	None	Very brief
Ponding:		
Depth (inches):	None	None
Frequency:	None	None
Duration:	None	None
Runoff Class:	High	Very high

Climatic Features

MLRA 63B 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 typically ranges from 19 to 24 inches per year. The average annual temperature is about 48° F. January is the coldest month with average temperatures ranging from about 15° F (Stephan, SD) to about 22° F (Winner, SD). July is the warmest month with temperatures averaging from about 73° F (Stephan, SD) to about 76° F (Winner, SD). The range of normal average monthly temperatures between the coldest and warmest months is about 56° 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.

	Minimum	Maximum
Frost-free period (days):	130	162
Freeze-free period (days):	148	180
Mean Annual Precipitation (inches):	19	24

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

	Precip. Min.	Precip. Max	Temp. Min.	Temp. Max.
January	0.39	0.45	3.1	33.0
February	0.54	0.71	8.9	38.7
March	1.11	1.59	18.7	47.5
April	1.90	2.72	31.4	62.0
May	2.80	3.40	42.7	73.1
June	3.05	3.60	53.0	82.6
July	2.70	3.16	58.5	89.9
August	2.03	2.69	56.2	88.4
September	1.76	2.51	45.8	78.9
October	1.47	1.55	33.2	65.7
November	0.59	0.94	19.2	47.8
December	0.35	0.62	8.1	36.5

Climate Stations		Period	
Station ID	Location or Name	From	To
NE5040	Lynch	1948	2007
NE5960	Niobrara	1948	2005
SD7992	Stephan	1948	2007
SD9367	Winner	1948	2007

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 soils in this site are well drained and formed in clayey alluvium or residuum from soft shale. The clay surface layer is 2 to 5 inches thick. The soils have a very slow infiltration rate except after dry periods when initial uptake may be rapid due to cracking of the surface. Gilgai microrelief occurs in some areas. When dry these soils crack. Wet surface compaction can occur with heavy traffic. This site should show slight to no evidence of rills or wind scoured areas. It is not uncommon to have some pedestalling of plants due to the inherent instability of the soils. Water flow paths are broken, irregular in appearance or discontinuous with numerous debris dams or vegetative barriers. The soil surface is stable and intact. Sub-surface soil layers are restrictive to water movement and root penetration.

These soils are highly susceptible to wind and water erosion. The hazard of water erosion increases on slopes greater than 6 percent or where vegetative cover is not adequate.

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

Parent Material Kind: alluvium, residuum
Parent Material Origin: shale, clayey
Surface Texture: clay
Surface Texture Modifier: none
Subsurface Texture Group: clayey
Surface Fragments ≤ 3” (% Cover): 0-4
Surface Fragments > 3” (%Cover): 0
Subsurface Fragments ≤ 3” (% Volume): 0-4
Subsurface Fragments > 3” (% Volume): 0

	<u>Minimum</u>	<u>Maximum</u>
Drainage Class:	well	well
Permeability Class:	very slow	slow
Depth (inches):	19	80
Electrical Conductivity (mmhos/cm)*:	0	16
Sodium Absorption Ratio*:	0	15
Soil Reaction (1:1 Water)*:	6.6	9.0
Soil Reaction (0.1M CaCl₂)*:	NA	NA
Available Water Capacity (inches)*:	1	4
Calcium Carbonate Equivalent (percent)*:	0	10

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

Plant Communities

Ecological Dynamics of the Site:

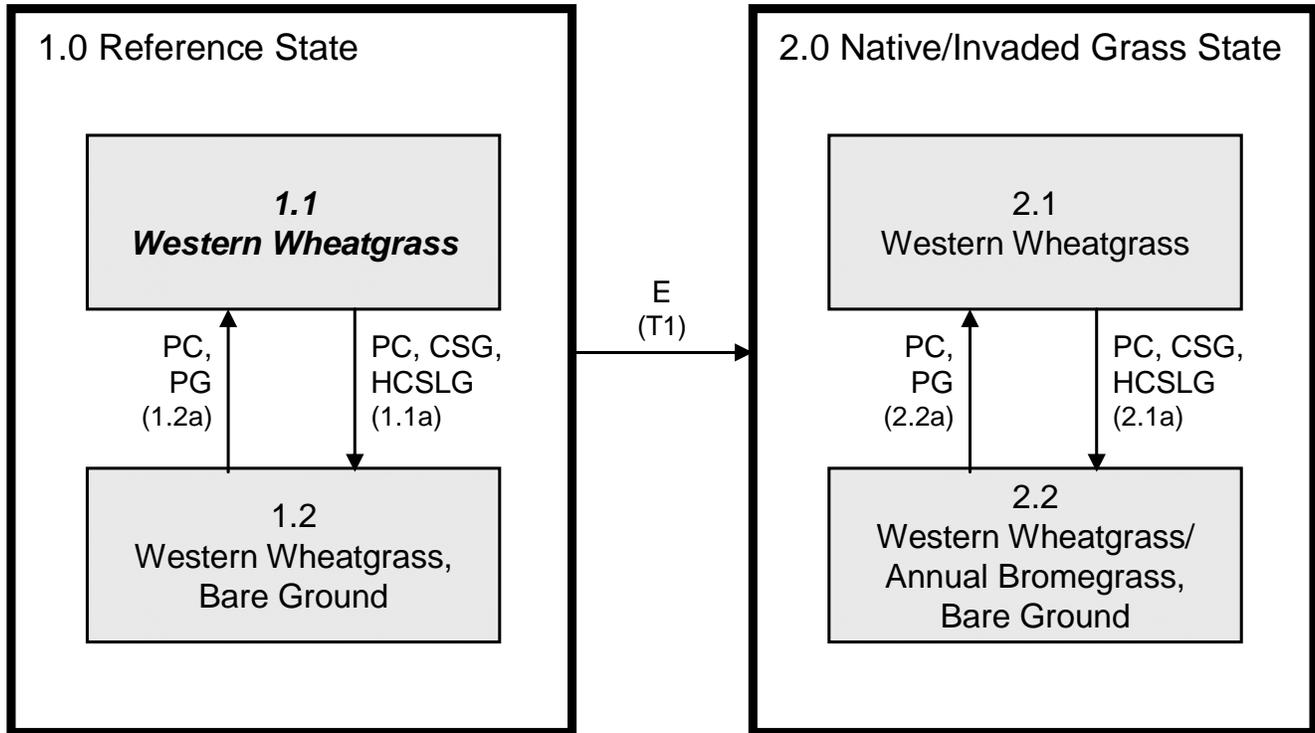
This site developed under Northern Great Plains climatic conditions, light to severe grazing by bison and other large herbivores, sporadic natural or man-caused wildfire (often of light intensities), and other biotic and abiotic factors that typically influence soil/site development. Changes will occur 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.

These soils are high in clay and have a low available water capacity. The shrink-swell potential is very high, resulting in cracks greater than 2 inches wide during dry periods. Western wheatgrass with its strong rhizomes and high drought tolerance is able to thrive in these soils. Western wheatgrass dominates the site and production is closely related to its vigor. Slickspots are sometimes associated with this site. Slickspots are bare ground areas that are affected by high sodium concentrations. The soil factors are the dominant influence and grazing management does not typically affect these areas.

Interpretations are primarily based on the Western Wheatgrass 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 community phases that can occur on the site and the transition pathways between communities. These are the most common plant community phases based on current knowledge and experience, and changes may be made as more data is collected. Narratives following the diagram contain more detail pertaining to the ecological processes.

Plant Communities and Transitional Pathways



Refer to narrative for details on pathways: **CSG** – Continuous seasonal grazing; **E** – Encroachment of non-native species; **HCSLG** – Heavy continuous season-long grazing; **PC** – Precipitation cycles; **PG** – Prescribed grazing.

Plant Community Composition and Group Annual Production

			1.1 Western Wheatgrass		
COMMON/GROUP NAME	SCIENTIFIC NAME	SYMBOL	Group	lbs./acre	% Comp
GRASSES & GRASS-LIKES				1530 - 1710	85 - 95
WHEATGRASS			1	630 - 990	35 - 55
western wheatgrass	Pascopyrum smithii	PASM	1	630 - 990	35 - 55
NEEDLEGRASS			2	270 - 630	15 - 35
green needlegrass	Nassella viridula	NAVI4	2	270 - 630	15 - 35
MID WARM-SEASON GRASS			3	36 - 180	2 - 10
sideoats grama	Bouteloua curtipendula	BOCU	3	36 - 180	2 - 10
SHORT WARM-SEASON GRASSES			4	36 - 180	2 - 10
blue grama	Bouteloua gracilis	BOGR2	4	18 - 144	1 - 8
buffalograss	Bouteloua dactyloides	BODA2	4	18 - 72	1 - 4
inland saltgrass	Distichlis spicata	DISP	4	0 - 54	0 - 3
GRASS-LIKES			5	18 - 90	1 - 5
needleleaf sedge	Carex duriuscula	CADU6	5	18 - 90	1 - 5
threadleaf sedge	Carex filifolia	CAFI	5	0 - 54	0 - 3
other grass-likes		2GL	5	0 - 54	0 - 3
FORBS			7	90 - 180	5 - 10
American vetch	Vicia americana	VIAM	7	0 - 18	0 - 1
biscuitroot	Lomatium spp.	LOMAT	7	18 - 36	1 - 2
curlycup gumweed	Grindelia squarrosa	GRSQ	7	0 - 36	0 - 2
goldenrod	Solidago spp.	SOLID	7	0 - 36	0 - 2
heath aster	Symphotrichum ericoides	SYER	7	18 - 36	1 - 2
pussytoes	Antennaria spp.	ANTEN	7	0 - 18	0 - 1
rush skeletonweed	Lygodesmia juncea	LYJU	7	0 - 18	0 - 1
scarlet gaura	Gaura coccinea	GACO5	7	0 - 18	0 - 1
scarlet globemallow	Sphaeralcea coccinea	SPCO	7	18 - 36	1 - 2
spiny phlox	Phlox hoodii	PHHO	7	18 - 36	1 - 2
textile onion	Allium textile	ALTE	7	18 - 36	1 - 2
western ragweed	Ambrosia psilostachya	AMPS	7	18 - 36	1 - 2
western wallflower	Erysimum capitatum var. capitatum	ERCAC	7	0 - 36	0 - 2
western yarrow	Achillea millefolium var. occidentalis	ACMIO	7	0 - 36	0 - 2
wild parsley	Musineon divaricatum	MUDI	7	18 - 36	1 - 2
native forbs		2FN	7	18 - 54	1 - 3
SHRUBS			8	18 - 90	1 - 5
brittle cactus	Opuntia fragilis	OPFR	8	0 - 36	0 - 2
broom snakeweed	Gutierrezia sarothrae	GUSA2	8	0 - 36	0 - 2
plains pricklypear	Opuntia polyacantha	OPPO	8	18 - 54	1 - 3
saltbush	Atriplex spp.	ATRIP	8	0 - 54	0 - 3
other shrubs		2SHRUB	8	0 - 36	0 - 2

Annual Production lbs./acre		LOW	RV	HIGH
GRASSES & GRASS-LIKES		1100 -	1611	-2105
FORBS		85 -	135	-200
SHRUBS		15 -	54	-95
TOTAL		1200 -	1800	-2400

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	1.1 Western Wheatgrass			2.2 Western Wheatgrass/Annual Bromegrass, Bare Ground		
		Group	lbs./acre	% Comp	Group	lbs./acre	% Comp
GRASSES & GRASS-LIKES			1530 - 1710	85 - 95		800 - 900	80 - 90
WHEATGRASS		1	630 - 990	35 - 55	1	250 - 500	25 - 50
western wheatgrass	PASM	1	630 - 990	35 - 55	1	250 - 500	25 - 50
NEEDLEGRASS		2	270 - 630	15 - 35	2	0 - 50	0 - 5
green needlegrass	NAVI4	2	270 - 630	15 - 35	2	0 - 50	0 - 5
MID WARM-SEASON GRASS		3	36 - 180	2 - 10	3	0 - 50	0 - 5
sideoats grama	BOCU	3	36 - 180	2 - 10	3	0 - 50	0 - 5
SHORT WARM-SEASON GRASSES		4	36 - 180	2 - 10	4	50 - 150	5 - 15
blue grama	BOGR2	4	18 - 144	1 - 8	4	20 - 120	2 - 12
buffalograss	BODA2	4	18 - 72	1 - 4	4	10 - 100	1 - 10
inland saltgrass	DISP	4	0 - 54	0 - 3	4	10 - 70	1 - 7
GRASS-LIKES		5	18 - 90	1 - 5	5	10 - 100	1 - 10
needleleaf sedge	CADU6	5	18 - 90	1 - 5	5	10 - 80	1 - 8
threadleaf sedge	CAFI	5	0 - 54	0 - 3	5	0 - 50	0 - 5
other grass-likes	2GL	5	0 - 54	0 - 3	5	0 - 50	0 - 5
NON-NATIVE GRASSES		6			6	10 - 250	1 - 25
bluegrass	POA	6			6	0 - 80	0 - 8
cheatgrass	BRTE	6			6	10 - 250	1 - 25
Japanese bromegrass	BRJA	6			6	10 - 250	1 - 25
FORBS		7	90 - 180	5 - 10	7	50 - 100	5 - 10
American vetch	VIAM	7	0 - 18	0 - 1			
biscuitroot	LOMAT	7	18 - 36	1 - 2	7	0 - 20	0 - 2
common dandelion	TAOF				7	0 - 30	0 - 3
curlycup gumweed	GRSQ	7	0 - 36	0 - 2	7	0 - 30	0 - 3
field pennycress	THAR5				7	0 - 30	0 - 3
goldenrod	SOLID	7	0 - 36	0 - 2	7	0 - 10	0 - 1
heath aster	SYER	7	18 - 36	1 - 2	7	0 - 10	0 - 1
pussytoes	ANTEN	7	0 - 18	0 - 1	7	0 - 10	0 - 1
rush skeletonweed	LYJU	7	0 - 18	0 - 1			
scarlet gaura	GACO5	7	0 - 18	0 - 1			
scarlet globemallow	SPCO	7	18 - 36	1 - 2	7	0 - 10	0 - 1
spiny phlox	PHHO	7	18 - 36	1 - 2	7	10 - 20	1 - 2
sweetclover	MELIL				7	0 - 50	0 - 5
textile onion	ALTE	7	18 - 36	1 - 2	7	0 - 10	0 - 1
western ragweed	AMPS	7	18 - 36	1 - 2	7	10 - 20	1 - 2
western salsify	TRDU				7	0 - 30	0 - 3
western wallflower	ERCAC	7	0 - 36	0 - 2	7	0 - 10	0 - 1
western yarrow	ACMIO	7	0 - 36	0 - 2	7	0 - 30	0 - 3
wild parsley	MUDI	7	18 - 36	1 - 2	7	0 - 20	0 - 2
native forbs	2FN	7	18 - 54	1 - 3	7	10 - 30	1 - 3
introduced forbs	2FI				7	0 - 40	0 - 4
SHRUBS		8	18 - 90	1 - 5	8	20 - 100	2 - 10
brittle cactus	OPFR	8	0 - 36	0 - 2	8	10 - 30	1 - 3
broom snakeweed	GUSA2	8	0 - 36	0 - 2	8	0 - 30	0 - 3
plains pricklypear	OPPO	8	18 - 54	1 - 3	8	10 - 40	1 - 4
saltbush	ATRIP	8	0 - 54	0 - 3			
other shrubs	2SHRUB	8	0 - 36	0 - 2	8	0 - 30	0 - 3

Annual Production lbs./acre	LOW	RV	HIGH	LOW	RV	HIGH
GRASSES & GRASS-LIKES	1100	1611	-2105	440	865	-1280
FORBS	85	135	-200	45	75	-110
SHRUBS	15	54	-95	15	60	-110
TOTAL	1200	1800	-2400	500	1000	-1500

This list of plants and their relative proportions are based on near normal years. Fluctuations in species composition and relative production may change from year to year dependent upon precipitation or other climatic factors. RV = Representative value.

Plant Community and Vegetation State Narratives

Reference State (State 1)

This state represents the natural range of variability that dominates the dynamics of this ecological site. This state is dominated by cool-season grasses. In pre-European times, the primary disturbance mechanisms for this site in the reference condition included somewhat frequent fire, precipitation cycles and grazing by large herding ungulates. Timing of fires and grazing coupled with weather events dictated the dynamics that occurred within the natural range of variability. Today, this state can be found on areas that are properly managed with grazing and/or prescribed burning, and sometimes on areas receiving occasional short periods of rest. Cool-season species can decline and a corresponding increase in short, warm-season grasses will occur. Under extended periods of disturbance the main change is a reduction in vigor and production and an increase in bare ground.

1.1 Western Wheatgrass Plant Community Phase

Interpretations are based primarily on the Western Wheatgrass Plant Community, which is also considered to be climax. This plant community evolved with grazing by large herbivores and occasional fire, and can be maintained with prescribed grazing, prescribed burning, or areas receiving occasional short periods of rest or deferment. The potential vegetation is about 85 percent grasses or grass-like plants, 10 percent forbs, and 5 percent shrubs. Cool-season grasses dominate the plant community. The major grasses include western wheatgrass and green needlegrass. Plant diversity is low, being dominated by western wheatgrass. Other grasses and grass-likes occurring on this site may include buffalograss, blue grama, sideoats grama, and sedge. The dominant forbs include biscuitroot, heath aster, and wild parsley. Shrubs that can occur in this plant community are brittle cactus, saltbush and plains pricklypear. Plant diversity is relatively low.

This plant community is well adapted to the Northern Great Plains climatic conditions. However, two to three years of drought can greatly reduce the vigor and abundance of the green needlegrass and western wheatgrass, while increasing the percent bare ground and creating moderate to high soil erosion potential. The actual plant composition may not be greatly changed, inherently the production of this plant community can vary tremendously with fluctuation in precipitation. Having average precipitation or above average, the plant community can make a fast recovery. If disturbed, dense clays are resilient. Mechanical practices such as deep ripping and furrowing can improve the hydrology, which invigorates the plant community. The native wheatgrass is strongly rhizomatous and adapted to droughty, saline soils. Water infiltration is low and runoff is very high due to the high clay content of the soil. Plant litter is properly distributed with some movement off-site and natural plant mortality is low.

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 sub-dominant.

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

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:

- 1.1a – Continuous seasonal grazing (grazing at moderate to heavy stocking levels at the same time of year each year), heavy continuous season-long grazing, or precipitation cycles (extended periods of well-below or well-above average precipitation) will shift this community to the *1.2 Western Wheatgrass, Bare Ground Plant Community Phase*.

1.2 Western Wheatgrass, Bare Ground Plant Community Phase

This plant community develops under droughty conditions, heavy spring grazing or long-term heavy continuous grazing. The potential vegetation is made up of about 80% grasses and grass-like plants, 10% forbs, and 10% shrubs. The grass component is often completely dominated by western wheatgrass. Other perennial grasses are generally not found on this site or are greatly diminished. Drought and heavy spring use will lower basal density of green needlegrass and western wheatgrass creating opportunities for invasive species such as field pennycress, curlycup gumweed, sweetclover, and annual forbs to occur. Brittle cactus and plains pricklypear are the commonly found shrubs.

When compared to the Western Wheatgrass Plant Community Phase, the vigor, production, and basal density of the grasses has been reduced. Often the site will be bare ground with a few sprigs of western wheatgrass and a likelihood of cheatgrass, Japanese brome grass, and bluegrass invading the site. Cool-season grass production is lessened along with a reduction in warm season grasses such as blue grama and buffalograss. Plant diversity is extremely low. Due to low basal density, soil erosion hazards are high.

This plant community is somewhat resistant to change. Moving this plant community toward the 1.1 Western Wheatgrass Plant Community can be accomplished through prescribed grazing and/or favorable climatic conditions.

This plant community will have similar plant composition to 2.2 Western Wheatgrass/Annual Bromegrass, Bare Ground Plant Community Phase (refer to the plant composition tables). The main difference is that this plant community phase does not have the presence of non-native invasive species such as Kentucky bluegrass and smooth bromegrass.

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:

- T1 – Encroachment of non-native invasive/noxious species will lead this plant community phase over a threshold to the *2.0 Native/Invaded Grass State*.
- 1.2a – Prescribed grazing (alternating season of use and providing adequate recovery periods) or periodic light to moderate grazing possibly including periodic rest will convert this plant community to the *1.1 Western Wheatgrass Plant Community Phase*. This pathway can also occur with varying precipitation cycles (extended periods of well-below or well-above precipitation).

2.1 Western Wheatgrass Plant Community Phase

This plant community results from an encroachment of non-native, invasive species such as cheatgrass, Japanese bromegrass, and/or bluegrass. This plant community will have similar plant composition to 1.1 Western Wheatgrass Plant Community Phase (refer to the plant composition tables). The main difference is that this plant community phase will have up to 10 percent of non-native invasive species such as cheatgrass, Japanese bromegrass, and/or bluegrass.

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 sub-dominant.

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

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 recovery pathways leading to other plant communities are as follows:

- 2.1a – Continuous seasonal grazing (grazing at moderate to heavy stocking levels at the same time of year each year), heavy continuous season-long grazing, or precipitation cycles (extended periods of well-below or well-above average precipitation) will shift this community to the *2.2 Western Wheatgrass/Annual Bromegrass, Bare Ground Plant Community Phase*.

2.2 Western Wheatgrass/Annual Bromegrass, Bare Ground Plant Community Phase

This plant community develops under droughty conditions, heavy spring grazing or long-term heavy continuous grazing. The potential vegetation is made up of about 80% grasses and grass-like plants, 10% forbs, and 10% shrubs. The grass component is often completely dominated by western wheatgrass. Other perennial grasses are generally not found on this site or are greatly diminished. Drought and heavy spring use will lower basal density of green needlegrass and western wheatgrass creating opportunities for invasive species such as field pennycress, curlycup gumweed, sweetclover, and annual forbs to occur. Brittle cactus and plains pricklypear are the commonly found shrubs.

When compared to the 1.1 Western Wheatgrass Plant Community Phase, the vigor, production, and basal density of the grasses has been reduced. Often the site will be bare ground with a few sprigs of western wheatgrass and a likelihood of cheatgrass, Japanese bromegrass, and bluegrass invading the site. Cool-season grass production is lessened along with a reduction in warm season grasses such as blue grama and buffalograss. Plant diversity is extremely low. Due to low basal density, soil erosion hazards are high.

This plant community is somewhat resistant to change. Moving this plant community toward the 2.1 Western Wheatgrass Plant Community can be accomplished through prescribed grazing and/or favorable climatic conditions.

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 restoration pathways leading to other states are as follows:

- 2.2a – Prescribed grazing (alternating season of use and providing adequate recovery periods) or periodic light to moderate grazing possibly including periodic rest will convert this plant community to the *2.1 Western Wheatgrass Plant Community Phase*. This pathway can also occur with varying precipitation cycles (extended periods of well-below or well-above precipitation).

Ecological Site Interpretations

Animal Community – Wildlife Interpretations

-- Under Development --

Western Wheatgrass Plant Community Phases (1.1 & 2.1):

Western Wheatgrass, Bare Ground Plant Community Phase (1.2):

Western Wheatgrass/Annual Bromegrass, Bare Ground Plant Community Phase (2.2):

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

Common Name	Cattle	Sheep	Horses	Deer	Antelope	Bison	Elk
Grasses and Grass-likes							
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
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
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
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
threadleaf sedge	U D U D	U P N D	U D U D	U D U D	U D U D	U D U D	U D U D
western wheatgrass	U P D U	N D N N	U P D U	N D N N	N D N N	U P D U	U P D U
Forbs							
American vetch	U D P U	U P P U	U D P U	U P P U	U P P U	U D P U	U P P U
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
curlycup gumweed	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
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
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
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
rush skeletonweed	U U U U	N N N N	U U U U	N N N N	N N N N	U U U U	N N N N
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
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
textile onion	U D U U	U D D U	U D U U	U D D U	U D D U	U D U U	U D D U
western ragweed	U U U U	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
Shrubs							
brittle 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
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
plains pricklypear	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
saltbush	P D D P	P D D P	P D D P	P D D P	P D D P	P D D P	P D 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)
Western Wheatgrass (1.1 & 2.1)	2000	0.55
Western Wheatgrass, Bare Ground (1.2)	1000	0.27
Western Wheatgrass/Annual Bromegrass, Bare Ground (2.2)	1000	0.27

* Based on 912 lbs./acre (air-dry weight) per Animal Unit Month (AUM), and on 25% harvest efficiency (refer to USDA NRCS, National Range and Pasture Handbook).

Grazing by domestic livestock is one of the major income-producing industries in the area. Rangeland in this area may provide yearlong forage. During the dormant period, the forage for livestock will likely be lacking protein to meet livestock requirements, and added protein will allow ruminants to better utilize the energy stored in grazed plant materials. A forage quality test (either directly or through fecal sampling) should be used to determine the level of supplementation needed.

Hydrology Functions

Water is the principal factor limiting forage production on this site. This site is dominated by soils in hydrologic group D. Infiltration is slow and runoff potential for this site is high. In many cases, areas with greater than 75% ground cover have the greatest potential for higher 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/or buffalograss will result in reduced infiltration and increased runoff. Areas where ground cover is less than 50% have the greatest potential to have reduced infiltration and higher runoff (refer to Section 4, NRCS National Engineering Handbook for runoff quantities and hydrologic curves).

Recreational Uses

This site provides hunting, hiking, photography, bird watching and other opportunities. The wide variety 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

Clayey (R063BY011SD), Shallow Clay (R063BY017SD), Clayey Overflow (R063BY021SD)

Similar Sites

(R063BY013SD) – Claypan [more short warm-season grasses, higher diversity; higher production]

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, NRCS; Stan Boltz, Range Management Specialist, NRCS; Dana Larsen, Range Management Specialist, NRCS.

<u>Data Source</u>	<u>Number of Records</u>	<u>Sample Period</u>	<u>State</u>	<u>County</u>
SCS-RANGE-417	3	2004 – 2006	SD	Buffalo, Tripp

State Correlation

This site has been correlated with Nebraska and South Dakota in MLRA 63B.

Field Offices/Counties

Ainsworth, NE	Keya Paha/Rock	Highmore, SD	Hyde	Pierre, SD	Hughes
Bloomfield, NE	Knox	Kennebec, SD	Lyman	Spencer, NE	Boyd
Burke, SD	Gregory	Lake Andes, SD	Charles Mix	White River, SD	Todd/Mellette
Chamberlain, SD	Brule/Buffalo	O'Neill, NE	Holt		

Relationship to Other Established Classifications

Level IV Ecoregions of the Conterminous United States: 42h - Southern River Breaks.

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://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.

Site Description Approval

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