

# United States Department of Agriculture Natural Resources Conservation Service

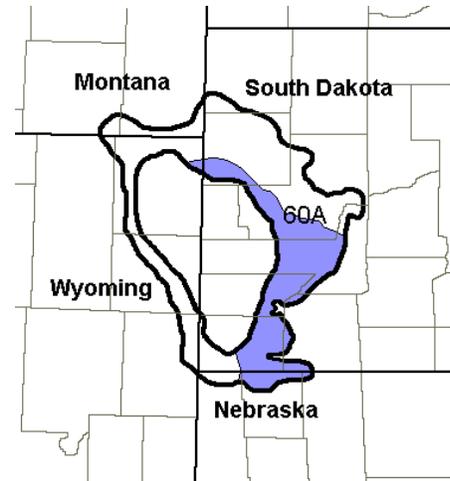
## Ecological Site Description

**Site Type:** Rangeland

**Site Name:** Loamy 16-18" P.Z.

**Site ID:** R060AY041SD

**Major Land Resource Area:** 60A – Pierre Shale Plains



### Physiographic Features

This site occurs on gently undulating to rolling uplands.

**Landform:** terrace, pediment, plain

**Aspect:** N/A

	<u>Minimum</u>	<u>Maximum</u>
<b>Elevation (feet):</b>	2500	4300
<b>Slope (percent):</b>	0	15
<b>Water Table Depth (inches):</b>	None	None
<b>Flooding:</b>		
<b>Frequency:</b>	None	None
<b>Duration:</b>	None	None
<b>Ponding:</b>		
<b>Depth (inches):</b>	None	None
<b>Frequency:</b>	None	None
<b>Duration:</b>	None	None
<b>Runoff Class:</b>	Low	Very high

### Climatic Features

The climate in this MLRA is typical of the drier portions of the Northern Great Plains where sagebrush steppes to the west yield to grassland steppes to the east. Annual precipitation ranges from 16 to 18 inches per year, with most occurring during the growing season. Temperatures show a wide range between summer and winter and between daily maximums and minimums, due to the high elevation and dry air, which permits rapid incoming and outgoing radiation. Cold air masses from Canada in winter move rapidly from northwest to southeast and account for extreme minimum temperatures. Chinook winds may occur in winter and bring rapid rises in temperature. Extreme storms may occur during the winter, but most severely affect ranch operations during late winter and spring. The normal average annual temperature is about 47° F. January is the coldest month with average temperatures ranging from about 18° F (Newell, SD) to about 23° F (Oelrichs, SD). July is the warmest month with average temperatures ranging from about 72° F (Newell, SD) to about 74° F (Oelrichs, SD). The range of normal average monthly temperatures between the coldest and warmest months is about 53° F. Hourly winds are estimated to average about 11 miles per hour annually, ranging from about 13 miles per hour during the spring to about 10 miles per hour during the summer. Daytime winds are generally stronger than nighttime and occasional strong storms may bring brief periods of high winds with gusts to more than 50 miles per hour.

Growth of cool season plants begins in early to mid March, slowing or ceasing in late June. Warm season plants begin growth about mid May and can continue to early or mid September. Green up of cool season plants may occur in September and October when adequate soil moisture is present.

	<u>Minimum</u>	<u>Maximum</u>
<b>Frost-free period (days):</b>	124	135
<b>Freeze-free period (days):</b>	143	154
<b>Mean Annual Precipitation (inches):</b>	16	18

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

	Precip. Min.	Precip. Max	Temp. Min.	Temp. Max.
January	0.37	0.43	6.0	34.6
February	0.45	0.57	11.4	40.9
March	0.85	0.94	19.5	48.8
April	1.66	1.78	31.4	60.9
May	2.74	3.19	42.6	71.1
June	3.05	3.38	52.2	81.5
July	1.87	2.78	57.8	90.3
August	1.37	1.76	55.9	89.7
September	1.26	1.50	44.8	79.2
October	1.07	1.32	32.9	65.5
November	0.57	0.61	20.3	47.9
December	0.48	0.49	10.0	37.5

Climate Stations		Period	
Station ID	Location or Name	From	To
SD0236	Ardmore 2 N	1948	1999
SD0559	Belle Fourche	1948	1999
SD1124	Buffalo Gap	1951	1999
SD6054	Newell	1948	1999
SD6212	Oelrichs	1948	1999
SD8911	Wasta	1949	1999

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

### Influencing Water Features

No significant water features influence this site.

### Representative Soil Features

The soils in this site are well drained and formed in residuum, alluvial materials, and eolian deposits. The surface layer is 4 to 11 inches thick. The texture of the subsurface soils range from loam to clay. The soils have a moderate infiltration rate. This site typically should show slight to no evidence of rills, wind scoured areas or pedestalled plants. Water flow paths are broken, irregular in appearance or discontinuous with numerous debris dams or vegetative barriers. The soil surface is stable and intact. Sub-surface soil layers are not restrictive to water movement and root penetration.

These soils are mainly susceptible to water erosion. The hazard of water erosion increases on slopes greater than about 9 percent. More information can be found in the various soil survey reports.

Contact the local USDA Service Center for soil survey reports that include more detail specific to your location.

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

	<u>Minimum</u>	<u>Maximum</u>
<b>Drainage Class:</b>	well	well
<b>Permeability Class:</b>	moderately slow	moderate
<b>Depth to Bedrock (inches):</b>	20	80
<b>Electrical Conductivity (mmhos/cm)*:</b>	0	4
<b>Sodium Absorption Ratio*:</b>	0	5
<b>Soil Reaction (1:1 Water)*:</b>	6.1	9.0
<b>Soil Reaction (0.1M CaCl<sub>2</sub>)*:</b>	NA	NA
<b>Available Water Capacity (inches)*:</b>	6	8
<b>Calcium Carbonate Equivalent (percent)*:</b>	0	15

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

## Plant Communities

### Ecological Dynamics of the Site:

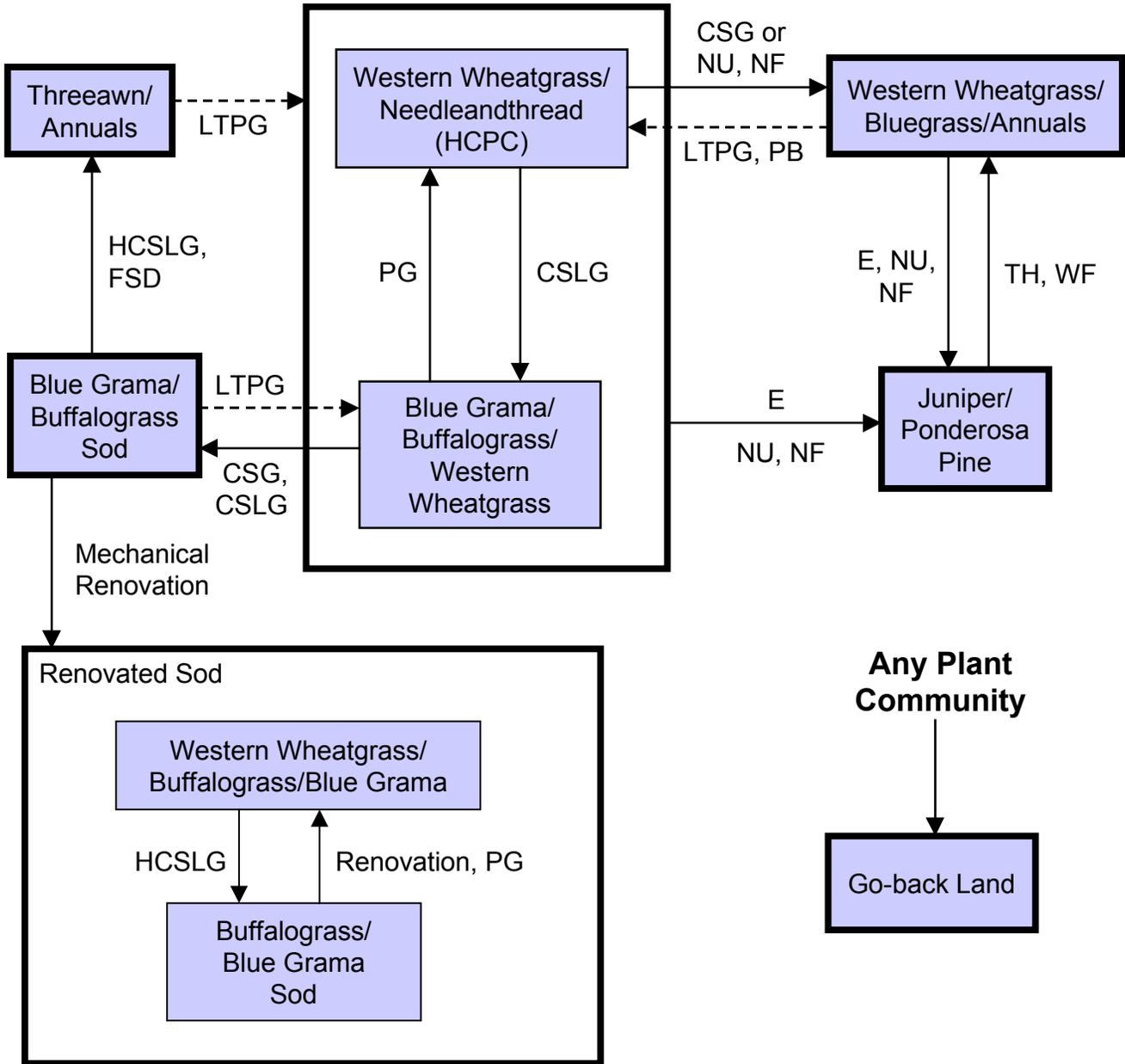
This site developed under Northern Great Plains climatic conditions, natural influences of large herbivores, occasional fire, and other biotic and abiotic factors that typically influence soil/site development. Changes will occur in the plant communities due to short-term weather variations, impacts 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.

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

The plant community upon which interpretations are primarily based is the Historic Climax Plant Community (HCPC). The HCPC has been determined by studying rangeland relic areas, areas protected from excessive disturbance, and areas under long-term rotational grazing regimes. Trends in plant community dynamics ranging from heavily grazed to lightly grazed areas, seasonal use pastures, and historical accounts also have been used. Plant communities, states, transitional pathways, and thresholds have been determined through similar studies and experience.

The following is a diagram that illustrates the common plant communities that can occur on the site and the transition pathways between communities. The ecological processes are discussed in more detail in the plant community descriptions following the diagram.

### Plant Communities and Transitional Pathways



**CSG** - Continuous seasonal grazing; **CSLG** - Continuous season-long grazing; **E** - Encroachment or escaped; **FSD** - Frequent & severe defoliation (rodents, insects, etc.); **HCPC** - Historic Climax Plant Community; **HCSLG** - Heavy continuous season-long grazing; **LTPG** - Long-term prescribed grazing; **NF** - No fire; **NU** - Non-use; **PB** - Prescribed burn; **PG** - Prescribed grazing; **TH** - Timber harvest; **WF** - Wildfire.

**Plant Community Composition and Group Annual Production**

COMMON/GROUP NAME	SCIENTIFIC NAME	SYMBOL	Western Wheatgrass/ Needleandthread (HCPC)		
			Group	lbs./acre	% Comp
<b>GRASSES &amp; GRASS-LIKES</b>				1870 - 1980	85 - 90
<b>RHIZOMATOUS WHEATGRASSES</b>			<b>1</b>	<b>550 - 770</b>	<b>25 - 35</b>
western wheatgrass	Pascopyrum smithii	PASM	1	440 - 660	20 - 30
thickspike wheatgrass	Elymus lanceolatus ssp. lanceolatus	ELLAL	1	110 - 220	5 - 10
<b>NEEDLEGRASS</b>			<b>2</b>	<b>330 - 440</b>	<b>15 - 20</b>
needleandthread	Hesperostipa comata ssp. comata	HECOC8	2	220 - 440	10 - 20
green needlegrass	Nassella viridula	NAVI4	2	0 - 220	0 - 10
<b>WARM-SEASON SHORT GRASSES</b>			<b>3</b>	<b>110 - 220</b>	<b>5 - 10</b>
blue grama	Bouteloua gracilis	BOGR2	3	110 - 220	5 - 10
buffalograss	Buchloe dactyloides	BUDA	3	0 - 44	0 - 2
<b>NATIVE GRASSES &amp; GRASS-LIKES</b>			<b>4</b>	<b>220 - 440</b>	<b>10 - 20</b>
little bluestem	Schizachyrium scoparium	SCSC	4	22 - 110	1 - 5
sideoats grama	Bouteloua curtipendula	BOCU	4	110 - 220	5 - 10
big bluestem	Andropogon gerardii	ANGE	4	0 - 110	0 - 5
sedge	Carex spp.	CAREX	4	110 - 220	5 - 10
Scribner panicum	Dichanthelium oligosanthes var. scribnerianum	DIOLS	4	0 - 22	0 - 1
prairie junegrass	Koeleria macrantha	KOMA	4	0 - 44	0 - 2
threeawn	Aristida spp.	ARIST	4	0 - 22	0 - 1
other perennial grasses		2GP	4	0 - 66	0 - 3
<b>FORBS</b>			<b>6</b>	<b>110 - 220</b>	<b>5 - 10</b>
American vetch	Vicia americana	VIAM	6	22 - 66	1 - 3
cudweed sagewort	Artemisia ludoviciana	ARLU	6	22 - 66	1 - 3
dotted gayfeather	Liatris punctata	LIPU	6	0 - 22	0 - 1
false boneset	Brickellia eupatorioides	BREU	6	0 - 22	0 - 1
false gromwell	Onosmodium molle	ONMO	6	0 - 22	0 - 1
goldenrod	Solidago spp.	SOLID	6	22 - 44	1 - 2
green sagewort	Artemisia dracuncululus	ARDR4	6	0 - 44	0 - 2
gromwell	Buglossoides arvensis	BUAR3	6	0 - 22	0 - 1
heath aster	Symphyotrichum ericoides	SYER	6	0 - 22	0 - 1
milkvetch	Astragalus spp.	ASTRA	6	0 - 22	0 - 1
penstemon	Penstemon spp.	PENST	6	0 - 22	0 - 1
prairie coneflower	Ratibida columnifera	RACO3	6	0 - 44	0 - 2
purple coneflower	Echinacea angustifolia	ECAN2	6	0 - 22	0 - 1
pussytoes	Antennaria spp.	ANTEN	6	0 - 66	0 - 3
scarlet globemallow	Sphaeralcea coccinea	SPCO	6	0 - 44	0 - 2
scurfpea	Psoralegium spp.	PSORA2	6	22 - 110	1 - 5
spiderwort	Tradescantia spp.	TRADE	6	0 - 44	0 - 2
textile onion	Allium textile	ALTE	6	0 - 22	0 - 1
verbena	Verbena spp.	VERBE	6	0 - 66	0 - 3
western ragweed	Ambrosia psilostachya	AMPS	6	22 - 66	1 - 3
other perennial forbs		2FP	6	0 - 44	0 - 2
<b>SHRUBS</b>			<b>7</b>	<b>22 - 110</b>	<b>1 - 5</b>
broom snakeweed	Gutierrezia sarothrae	GUSA2	7	0 - 44	0 - 2
cactus	Opuntia spp.	OPUNT	7	0 - 22	0 - 1
fringed sagewort	Artemisia frigida	ARFR4	7	0 - 66	0 - 3
leadplant	Amorpha canescens	AMCA6	7	0 - 110	0 - 5
rose	Rosa spp.	ROSA5	7	0 - 66	0 - 3
snowberry	Symphoricarpos spp.	SYMPH	7	22 - 110	1 - 5
other shrubs		2SHRUB	7	0 - 44	0 - 2

Annual Production lbs./acre		LOW	RV	HIGH
<b>GRASSES &amp; GRASS-LIKES</b>		1375	1969	-2560
<b>FORBS</b>		105	165	-225
<b>SHRUBS</b>		20	66	-115
<b>TOTAL</b>		1500	2200	-2900

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/ Needleandthread (HPCP)		Blue Grama/Bufalograss/ Western Wheatgrass		Western Wheatgrass/ Bluegrass/Annuals		Blue Grama/Bufalograss Sod						
		Grp	lbs./acre	% Comp	Grp	lbs./acre	% Comp	Grp	lbs./acre	% Comp				
<b>GRASSES &amp; GRASS-LIKES</b>			1760 - 1980	80 - 90		1200 - 1350	80 - 90		1280 - 1440	80 - 90		640 - 720	80 - 90	
<b>RHIZOMATOUS WHEATGRASSES</b>		1	550 - 770	25 - 35	1	150 - 300	10 - 20	1	320 - 800	20 - 50	1	16 - 40	2 - 5	
western wheatgrass	PASM	1	440 - 660	20 - 30	1	150 - 300	10 - 20	1	240 - 640	15 - 40	1	16 - 40	2 - 5	
thickspike wheatgrass	ELLAL	1	110 - 220	5 - 10	1	0 - 75	0 - 5	1	80 - 240	5 - 15	1	0 - 8	0 - 1	
<b>NEEDLEGRASS</b>		2	330 - 440	15 - 20	2	30 - 150	2 - 10	2	80 - 320	5 - 20	2	0 - 40	0 - 5	
needleandthread	HECOC8	2	220 - 440	10 - 20	2	30 - 120	2 - 8	2	32 - 160	2 - 10	2	0 - 40	0 - 5	
green needlegrass	NAVI4	2	22 - 220	1 - 10	2	0 - 75	0 - 5	2	32 - 160	2 - 10	2	0 - 8	0 - 1	
<b>WARM-SEASON SHORT GRASSES</b>		3	110 - 220	5 - 10	3	300 - 525	20 - 35	3	16 - 128	1 - 8	3	320 - 480	40 - 60	
blue grama	BOGR2	3	110 - 220	5 - 10	3	225 - 450	15 - 30	3	16 - 80	1 - 5	3	160 - 440	20 - 55	
bufalograss	BUDA	3	0 - 44	0 - 2	3	75 - 150	5 - 10	3	0 - 80	0 - 5	3	80 - 240	10 - 30	
<b>NATIVE GRASSES &amp; GRASS-LIKES</b>		4	220 - 440	10 - 20	4	75 - 225	5 - 15	4	80 - 320	5 - 20	4	80 - 160	10 - 20	
little bluestem	SCSC	4	22 - 110	1 - 5	4	0 - 45	0 - 3	4	0 - 48	0 - 3	4	0 - 8	0 - 1	
sideoats grama	BOCU	4	110 - 220	5 - 10	4	15 - 75	1 - 5	4	16 - 80	1 - 5	4	8 - 64	1 - 8	
big bluestem	ANGE	4	0 - 110	0 - 5	4	0 - 30	0 - 2	4	0 - 48	0 - 3	4	0 - 8	0 - 1	
sedge	CAREX	4	110 - 220	5 - 10	4	75 - 150	5 - 10	4	32 - 80	2 - 5	4	40 - 80	5 - 10	
Scribner panicum	DIOLS	4	0 - 22	0 - 1	4	0 - 15	0 - 1	4	32 - 80	2 - 5	4	0 - 8	0 - 1	
prairie junegrass	KOMA	4	0 - 44	0 - 2	4	15 - 30	1 - 2	4	16 - 80	1 - 5	4	8 - 16	1 - 2	
sixweeks fescue	VUOC							4	0 - 32	0 - 2	4	0 - 24	0 - 3	
Canada wildrye	ELCA4							4	0 - 16	0 - 1				
threeawn	ARIST	4	0 - 22	0 - 1	4	0 - 45	0 - 3	4	0 - 16	0 - 1	4	8 - 40	1 - 5	
dropseed	SPORO					0 - 75	0 - 5	4	0 - 32	0 - 2	4	8 - 40	1 - 5	
other perennial grasses	ZGP	4	0 - 66	0 - 3	4	0 - 45	0 - 3	4	0 - 48	0 - 3	4	0 - 24	0 - 3	
<b>NON-NATIVE GRASSES</b>		5			5	15 - 120	1 - 8	5	240 - 640	15 - 40	5	16 - 80	2 - 10	
cheatgrass	BRTE				5	15 - 75	1 - 5	5	16 - 160	1 - 10	5	16 - 80	2 - 10	
Kentucky bluegrass	POPR				5	0 - 75	0 - 5	5	240 - 640	15 - 40	5	0 - 40	0 - 5	
smooth bromegrass	BRIN2							5	0 - 80	0 - 5				
<b>FORBS</b>		6	110 - 330	5 - 15	6	75 - 225	5 - 15	6	80 - 240	5 - 15	6	40 - 120	5 - 15	
American vetch	VIAM	6	22 - 66	1 - 3	6	15 - 45	1 - 3	6	16 - 48	1 - 3	6	8 - 24	1 - 3	
cudweed sagewort	ARLU	6	22 - 66	1 - 3	6	15 - 45	1 - 3	6	32 - 80	2 - 5	6	8 - 24	1 - 3	
dotted gayfeather	LIPU	6	0 - 22	0 - 1	6	0 - 15	0 - 1	6	0 - 16	0 - 1	6	0 - 8	0 - 1	
false boneset	BREU	6	0 - 22	0 - 1	6	0 - 15	0 - 1	6	0 - 16	0 - 1				
false gromwell	ONMO	6	0 - 22	0 - 1	6	0 - 15	0 - 1	6	0 - 16	0 - 1				
fetid marigold	DYPA										6	0 - 8	0 - 1	
goldenrod	SOLID	6	22 - 44	1 - 2	6	0 - 15	0 - 1	6	16 - 48	1 - 3	6	0 - 8	0 - 1	
green sagewort	ARDR4	6	0 - 44	0 - 2	6	15 - 30	1 - 2	6	0 - 32	0 - 2	6	8 - 40	1 - 5	
gromwell	BUAR3	6	0 - 22	0 - 1	6	0 - 15	0 - 1	6	0 - 16	0 - 1	6	0 - 8	0 - 1	
heath aster	SYER	6	0 - 22	0 - 1	6	0 - 30	0 - 2	6	16 - 48	1 - 3	6	8 - 24	1 - 3	
milkvetch	ASTRA	6	0 - 22	0 - 1	6	0 - 15	0 - 1	6	0 - 16	0 - 1	6	0 - 8	0 - 1	
penstemon	PENST	6	0 - 22	0 - 1	6	0 - 15	0 - 1	6	0 - 16	0 - 1				
prairie coneflower	RAC03	6	0 - 44	0 - 2	6	15 - 30	1 - 2	6	0 - 16	0 - 1	6	8 - 24	1 - 3	
purple coneflower	ECAN2	6	0 - 22	0 - 1	6	0 - 15	0 - 1	6	0 - 16	0 - 1	6	0 - 8	0 - 1	
pussytoes	ANTEN	6	0 - 66	0 - 3	6	15 - 60	1 - 4	6	0 - 32	0 - 2	6	8 - 40	1 - 5	
salsify	TRAGO				6	15 - 30	1 - 2	6	16 - 32	1 - 2	6	8 - 24	1 - 3	
scarlet globemallow	SPCO	6	0 - 44	0 - 2	6	0 - 30	0 - 2	6	0 - 32	0 - 2	6	0 - 16	0 - 2	
scurfpea	PSORA2	6	22 - 110	1 - 5	6	15 - 75	1 - 5	6	16 - 80	1 - 5	6	16 - 40	2 - 5	
spiderwort	TRADE	6	0 - 44	0 - 2	6	0 - 30	0 - 2	6	0 - 32	0 - 2				
textile onion	ALTE	6	0 - 22	0 - 1	6	15 - 30	1 - 2	6	16 - 32	1 - 2	6	8 - 16	1 - 2	
verbena	VERBE	6	0 - 66	0 - 3	6	15 - 45	1 - 3	6	32 - 64	2 - 4	6	8 - 24	1 - 3	
western ragweed	AMPS	6	22 - 66	1 - 3	6	15 - 45	1 - 3	6	16 - 128	1 - 8	6	8 - 24	1 - 3	
other perennial forbs	ZFP	6	0 - 44	0 - 2	6	0 - 30	0 - 2	6	0 - 32	0 - 2	6	0 - 16	0 - 2	
<b>SHRUBS</b>		7	22 - 110	1 - 5	7	15 - 75	1 - 5	7	16 - 80	1 - 5	7	8 - 40	1 - 5	
broom snakeweed	GUSA2	7	0 - 44	0 - 2	7	0 - 30	0 - 2	7	0 - 32	0 - 2	7	8 - 24	1 - 3	
cactus	OPUNT	7	0 - 22	0 - 1	7	0 - 15	0 - 1	7	0 - 32	0 - 2	7	8 - 24	1 - 3	
fringed sagewort	ARFR4	7	0 - 66	0 - 3	7	15 - 75	1 - 5	7	0 - 32	0 - 2	7	8 - 40	1 - 5	
leadplant	AMCA6	7	0 - 110	0 - 5										
rose	ROSA5	7	0 - 66	0 - 3	7	0 - 45	0 - 3	7	0 - 32	0 - 2				
snowberry	SYMPH	7	22 - 110	1 - 5	7	15 - 75	1 - 5	7	16 - 80	1 - 5	7	0 - 40	0 - 5	
other shrubs	ZSHRUB	7	0 - 44	0 - 2	7	0 - 30	0 - 2	7	0 - 32	0 - 2	7	0 - 8	0 - 1	
<b>TREES</b>		8			8	0 - 15	0 - 1	8	0 - 48	0 - 3	8			
juniper	JUNIP				8	0 - 15	0 - 1	8	0 - 48	0 - 3				
ponderosa pine	PIPO				8	0 - 15	0 - 1	8	0 - 48	0 - 3				
<b>Annual Production lbs./acre</b>			LOW	RV	HIGH	LOW	RV	HIGH	LOW	RV	HIGH	LOW	RV	HIGH
<b>GRASSES &amp; GRASS-LIKES</b>			1375	1914	2435	1020	1298	1570	710	1368	1815	460	696	830
<b>FORBS</b>			105	220	350	70	150	230	75	160	250	35	80	125
<b>SHRUBS</b>			20	66	115	10	45	80	15	48	85	5	24	45
<b>TREES</b>						0	8	20	0	24	50			
<b>TOTAL</b>			1500	2200	2900	1100	1500	1900	800	1600	2200	500	800	1000

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/ Needleandthread (HCPC)			Juniper/Ponderosa Pine			Threawn/Annuals		
		Grp	lbs./acre	% Comp	Grp	lbs./acre	% Comp	Grp	lbs./acre	% Comp
<b>GRASSES &amp; GRASS-LIKES</b>			1870 - 1980	85 - 90		240 - 480	30 - 60		420 - 560	60 - 80
<b>RHIZOMATOUS WHEATGRASSES</b>		1	550 - 770	25 - 35	1	40 - 120	5 - 15	1	7 - 35	1 - 5
western wheatgrass	PASM	1	440 - 660	20 - 30	1	40 - 120	5 - 15	1	7 - 35	1 - 5
thickspike wheatgrass	ELLAL	1	110 - 220	5 - 10	1	0 - 40	0 - 5	1	0 - 7	0 - 1
<b>NEEDLEGRASS</b>		2	330 - 440	15 - 20	2	40 - 80	5 - 10	2	0 - 35	0 - 5
needleandthread	HECOC8	2	220 - 440	10 - 20	2	16 - 80	2 - 10	2	0 - 35	0 - 5
green needlegrass	NAVI4	2	0 - 220	0 - 10	2	0 - 40	0 - 5	2	0 - 7	0 - 1
<b>WARM-SEASON SHORT GRASSES</b>		3	110 - 220	5 - 10	3	8 - 40	1 - 5	3	0 - 35	0 - 5
blue grama	BOGR2	3	110 - 220	5 - 10	3	8 - 24	1 - 3	3	0 - 35	0 - 5
buffalograss	BUDA	3	0 - 44	0 - 2	3	0 - 16	0 - 2	3	0 - 14	0 - 2
<b>NATIVE GRASSES &amp; GRASS-LIKES</b>		4	220 - 440	10 - 20	4	240 - 520	30 - 65	4	280 - 525	40 - 75
little bluestem	SCSC	4	22 - 110	1 - 5	4	16 - 80	2 - 10	4	0 - 14	0 - 2
sideoats grama	BOCU	4	110 - 220	5 - 10	4	8 - 40	1 - 5			
big bluestem	ANGE	4	0 - 110	0 - 5	4	0 - 80	0 - 10			
sedge	CAREX	4	110 - 220	5 - 10	4	16 - 80	2 - 10	4	0 - 7	0 - 1
Scribner panicum	DIOLS	4	0 - 22	0 - 1	4	0 - 24	0 - 3	4	0 - 35	0 - 5
prairie junegrass	KOMA	4	0 - 44	0 - 2	4	16 - 40	2 - 5			
sixweeks fescue	VUOC							4	0 - 7	0 - 1
Canada wildrye	ELCA4				4	8 - 80	1 - 10			
threawn	ARIST	4	0 - 22	0 - 1				4	350 - 490	50 - 70
dropseed	SPORO				4	0 - 40	0 - 5			
other perennial grasses	ZGP	4	0 - 66	0 - 3	4	8 - 40	1 - 5	4	0 - 14	0 - 2
<b>NON-NATIVE GRASSES</b>		5			5	40 - 160	5 - 20	5	14 - 70	2 - 10
cheatgrass	BRTE				5	8 - 80	1 - 10	5	14 - 70	2 - 10
Kentucky bluegrass	POPR				5	40 - 120	5 - 15	5	0 - 14	0 - 2
smooth bromegrass	BRIN2				5	0 - 8	0 - 1			
<b>FORBS</b>		6	110 - 220	5 - 10	6	40 - 80	5 - 10	6	70 - 140	10 - 20
American vetch	VIAM	6	22 - 66	1 - 3	6	0 - 16	0 - 2			
cutweed sagewort	ARLU	6	22 - 66	1 - 3	6	8 - 24	1 - 3	6	7 - 21	1 - 3
dotted gayfeather	LIPU	6	0 - 22	0 - 1	6	0 - 16	0 - 2			
false bonaset	BREU	6	0 - 22	0 - 1	6	0 - 8	0 - 1			
false gromwell	ONMO	6	0 - 22	0 - 1	6	0 - 16	0 - 2			
fetid marigold	DYPA							6	14 - 56	2 - 8
goldenrod	SOLID	6	22 - 44	1 - 2	6	0 - 24	0 - 3			
green sagewort	ARDR4	6	0 - 44	0 - 2				6	0 - 7	0 - 1
gromwell	BUAR3	6	0 - 22	0 - 1						
heath aster	SYER	6	0 - 22	0 - 1	6	0 - 8	0 - 1	6	0 - 14	0 - 2
milkvetch	ASTRA	6	0 - 22	0 - 1	6	0 - 8	0 - 1	6	0 - 7	0 - 1
penstemon	PENST	6	0 - 22	0 - 1						
prairie coneflower	RACO3	6	0 - 44	0 - 2	6	0 - 8	0 - 1	6	0 - 7	0 - 1
purple coneflower	ECAN2	6	0 - 22	0 - 1	6	0 - 8	0 - 1			
pussytoes	ANTEN	6	0 - 66	0 - 3	6	8 - 16	1 - 2	6	0 - 35	0 - 5
salsify	TRAGO				6	0 - 8	0 - 1	6	0 - 7	0 - 1
scarlet globemallow	SPCO	6	0 - 44	0 - 2				6	0 - 7	0 - 1
scurfpea	PSORA2	6	22 - 110	1 - 5	6	0 - 16	0 - 2			
spiderwort	TRADE	6	0 - 44	0 - 2	6	0 - 16	0 - 2			
textile onion	ALTE	6	0 - 22	0 - 1	6	0 - 8	0 - 1	6	0 - 21	0 - 3
verbena	VERBE	6	0 - 66	0 - 3	6	8 - 24	1 - 3	6	14 - 70	2 - 10
western ragweed	AMPS	6	22 - 66	1 - 3	6	8 - 24	1 - 3	6	0 - 35	0 - 5
other perennial forbs	ZFP	6	0 - 44	0 - 2	6	8 - 24	1 - 3	6	0 - 70	0 - 10
<b>SHRUBS</b>		7	22 - 110	1 - 5	7	40 - 160	5 - 20	7	35 - 140	5 - 20
broom snakeweed	GUSA2	7	0 - 44	0 - 2				7	7 - 21	1 - 3
cactus	OPUNT	7	0 - 22	0 - 1				7	0 - 14	0 - 2
fringed sagewort	ARFR4	7	0 - 66	0 - 3	7	0 - 24	0 - 3	7	35 - 105	5 - 15
leadplant	AMCA6	7	0 - 110	0 - 5	7	0 - 8	0 - 1			
rose	ROSA5	7	0 - 66	0 - 3	7	8 - 40	1 - 5			
snowberry	SYMPH	7	22 - 110	1 - 5	7	16 - 40	2 - 5			
other shrubs	ZSHRUB	7	0 - 44	0 - 2	7	0 - 80	0 - 10			
<b>TREES</b>		8			8	80 - 160	10 - 20	8		
juniper	JUNIP				8	80 - 160	10 - 20			
ponderosa pine	PIPO				8	16 - 80	2 - 10			
<b>Annual Production lbs./acre</b>			LOW RV HIGH		LOW RV HIGH		LOW RV HIGH		LOW RV HIGH	
<b>GRASSES &amp; GRASS-LIKES</b>			1375 - 1969 - 2560		355 - 520 - 685		305 - 508 - 710			
<b>FORBS</b>			105 - 165 - 225		35 - 60 - 85		65 - 105 - 145			
<b>SHRUBS</b>			20 - 66 - 115		35 - 100 - 165		30 - 88 - 145			
<b>TREES</b>					75 - 120 - 165					
<b>TOTAL</b>			1500 - 2200 - 2900		500 - 800 - 1100		400 - 700 - 1000			

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

**Plant Community and Vegetation State Narratives**

Following are the narratives for each of the described plant communities. These plant communities may not represent every possibility, but they are the most prevalent and repeatable plant communities. The plant composition tables shown above have been developed from the best available knowledge at the time of this revision. As more information is collected, some of these plant community descriptions may be revised or removed, and new ones added. None of these plant communities should necessarily be thought of as “Desired Plant Communities”. According to the USDA NRCS National Range and Pasture Handbook, Desired Plant Communities (DPC’s) will be determined by the decision makers and will meet minimum quality criteria established by the NRCS. The main purpose for including any description of a plant community here is to capture the current knowledge and experience at the time of this revision.

**Western Wheatgrass/Needleandthread Plant Community**

The plant community upon which interpretations are primarily based is the Western Wheatgrass/Needleandthread Plant Community. This is also considered the Historic Climax Plant Community (HCPC). This plant community can be found on areas that are properly managed with grazing and/or prescribed burning, and sometimes on areas receiving occasional short periods of deferment. The potential vegetation is about 85-90% grasses or grass-like plants, 5-10% forbs, and 1-5% shrubs. Cool season grasses dominate the plant community. Major grasses include western wheatgrass and needleandthread. Other grasses occurring on the site include green needlegrass, blue grama, little bluestem, sideoats grama and sedge. Significant forbs include American vetch, cudweed sagewort, scurfpea, western ragweed, and goldenrod. The significant shrub that occurs in patchy mosaics is western snowberry. Other shrubs include rose, leadplant and broom snakeweed.

This plant community is well adapted to the Northern Great Plains climatic conditions. Individual species can vary greatly in production depending on growing conditions (timing and amount of precipitation and temperature). Plant litter is properly distributed with very little movement off-site and natural plant mortality is very low. The diversity in plant species allows for high drought tolerance. 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: SD6001

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:

- Continuous season-long grazing will lead to *Blue Grama/Buffalograss/Western Wheatgrass Plant Community*.
- Continuous seasonal grazing, or nonuse and no fire will lead to the *Western Wheatgrass/Bluegrass/Annuals Plant Community*.
- Encroachment (or escaped), nonuse, and no fire will lead to a *Juniper/Ponderosa Pine Plant Community*. This occurs when this plant community is protected from natural fires, or controlled burning.

**Blue Grama/Buffalograss/Western Wheatgrass Plant Community**

This plant community develops under continuous seasonal grazing (i.e., grazing an area during the same season every year) or from over utilization during extended drought periods. The potential vegetation is made up of approximately 80-90% grasses and grass-like species, 5-15% forbs and 1-5% shrubs. The dominant grasses include blue grama, buffalograss, western wheatgrass, needleandthread, and threadleaf sedge. Other grasses may include needleandthread, sideoats grama, prairie junegrass, red threeawn, bluegrass, little bluestem and big bluestem. The dominant forbs include scurfpeas, western ragweed, cudweed sagewort, scarlet globemallow, and other perennial aster species. Dominant shrubs in this community include western snowberry and wild rose. Broom snakeweed may also be present in significant amounts. Compared to the Western Wheatgrass/Needleandthread Plant Community, the shortgrass species including blue grama and buffalograss have increased. The cool season species including western wheatgrass and needlegrasses have decreased in composition. Annual bromes, wooly Indianwheat, and other annual grasses and forbs can invade the site. While plant diversity is relatively high, the structure of the community is dominated by short grasses.

This plant community is resistant to change. The dominant herbaceous species are mid to tall grasses and are very adapted to grazing; however, these grass species and the more palatable forbs will decrease in the community through long-term overgrazing. Soil erosion is low to moderate. Because of the sod forming habit of the dominant shortgrass species, water infiltration is low, and runoff is moderate to high. Typically the runoff is very clean because of the low potential for soil erosion.

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: SD6003

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

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

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

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

- With prescribed grazing, which includes moderate grazing pressure during the early spring (prior to May 1) and fall seasons (cool season regrowth) and with favorable growing conditions this plant community will move towards the *Western Wheatgrass/Needleandthread Plant Community*. Periods of non-use or deferment may be a management option to reach the HCPC. With favorable climatic conditions and proper management, this plant community can move to the *Western Wheatgrass/Needleandthread Plant Community* within 4 to 8 years.
- With continuous seasonal grazing this plant community will move towards the *Blue Grama/Buffalo-grass Sod Plant Community*. This would be typical of calving/lambing pastures where the unit is continuously utilized during the late winter through mid spring. This transition will result in decreased forage production and plant species diversity. This transition can also occur with continuous season-long grazing at high utilization levels. A blue grama, buffalograss sod will require significant economic inputs (i.e., high animal impact, mechanical renovation, etc.) and time to move it back to the *Blue Grama/Buffalograss/Western Wheatgrass Plant Community*.
- Encroachment (or escaped), nonuse, no fire will lead to a *Juniper/Ponderosa Pine Plant Community*. This occurs when this plant community is protected from natural fires, or controlled burning.

**Western Wheatgrass/Bluegrass/Annuals Plant Community**

This plant community developed under continuous seasonal grazing or under extended periods of non-use and no fire where a heavy litter layer builds up that can favor cool season species and invasion of bluegrass, annual brome and other invaders. Initially, the dominant grasses include bluegrass, western wheatgrass, needleandthread, and green needlegrass. Other grasses may include blue grama, buffalograss, threeawn, and prairie junegrass. With continued seasonal grazing and/or non-use and no fire, the plant community becomes dominated by bluegrass, annual brome and other annual grasses and less palatable forbs. Sedges will flourish in the understory. The dominant forbs include western ragweed, scurfpeas, cudweed sagewort, and verbenas. Dominant shrubs in this community include snowberry, rose, and plains pricklypear. Compared to the Western Wheatgrass/Needleandthread Plant Community, bluegrass increases significantly. Western wheatgrass and blue grama decrease in composition. Plant diversity declines.

This plant community is resistant to change, and if disturbed, it is resilient. Bluegrass will increase under grazing pressure. Cool, moist climatic conditions will also tend to increase bluegrass production. Soil erosion is low. Compared to the HCPC, infiltration is reduced, and runoff increases. Once this plant community is reached, time and external resources will be needed to see any immediate recovery in the diversity of the site.

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: SD6001

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:

- With prescribed grazing, or prescribed burning followed by prescribed grazing, this plant community will move toward the *Western Wheatgrass/Needleandthread Plant Community*. This would require long term prescribed grazing at moderate rates with favorable climatic conditions.
- Encroachment (or escaped), nonuse and no fire will lead to a *Juniper/Ponderosa Pine Plant Community*. This occurs when this plant community is protected from natural fires, or controlled burning.

**Blue Grama/Buffalograss Sod Plant Community**

This plant community is the result of heavy overuse and/or continuous seasonal grazing. Blue grama and buffalograss are the dominant species with the balance being a few species of cool-season grasses, warm-season grasses and miscellaneous forbs. Some of the minor species are western wheatgrass, threeawn, sedges, needleandthread, prairie junegrass, sideoats grama, and annual brome. There are a few forbs such as western ragweed, cudweed sagewort, green sagewort, and scarlet globemallow. The dominant shrubs include broom snakeweed and fringed sagewort. There is usually less than 10% bare ground.

When compared to the Western Wheatgrass/Needleandthread Plant Community, blue grama and buffalograss have increased significantly. The mid to tall grasses have declined dramatically. There is a chance that cheatgrass has invaded the site. Annual production has decreased significantly.

This plant community is resistant to change, as the dominant shortgrass species are very resistant to over-grazing. The thick sod prevents other species from getting established. This area provides reduced grazing use for livestock or wildlife. The quickest means to make this a productive site again is to do some sort of mechanical treatment, such as interseeding or chiseling. Most landowners however will farm the area for two or three years and then replant the area to mixture of tame or native grasses. Runoff will increase and infiltration will decrease. Soil erosion will be minimal due to the sod forming habit of blue grama and buffalograss. This could be advantageous for heavy use areas such as calving/lambing units, however nutrient runoff could be a potential problem.

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: SD6005

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

Growth curve description: Warm-season dominant.

JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
0	0	2	5	15	25	30	15	7	1	0	0

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

- Long-term prescribed grazing, will allow the site to return to the *Blue Grama/Buffalograss/Western Wheatgrass Plant Community*. This method of treatment will allow the site to return to the *Western Wheatgrass/Needleandthread Plant Community*. This method will take a long period of time (10+ years) and intensive management.
- With heavy continuous season-long grazing, or severe defoliation, this plant community will move toward the *Threeawn/Annuals Plant Community*. Forage production, species diversity, and ground cover will decrease.
- Mechanical treatment such as interseeding or chiseling will move this to the *Renovated Sod Western Wheatgrass/Buffalograss/Blue Grama Plant Community*. This will likely improve the productivity of this site. Mechanical renovation is not likely to take you back to the *Western Wheatgrass/Needleandthread Plant Community*.

### **Juniper/Ponderosa Pine Plant Community**

Historically, ponderosa pine was confined to ridges and steep shallow slopes located adjacent to this ecological site. Currently, ponderosa pine and juniper are expanding on to this ecological site due to the suppression of fire. Juniper/pine canopy is greater than 30% of mature trees. The understory production is made up of about 30-60% grasses and grass-like species, 5-10% forbs, and 5-20% shrubs. Dominant grasses include western wheatgrass, bluegrass, and needleandthread. Other grasses present include little bluestem, green needlegrass, threeawn, prairie junegrass, Canada wildrye and annual brome. Forbs commonly found include western ragweed, verbena, cudweed sagewort, fringed sagewort and pussytoes.

When compared to the Western Wheatgrass/Needleandthread Plant Community, ponderosa pine or juniper increases significantly. The grass component decreases dramatically. Annual production also decreases significantly. While the juniper/pine canopy provides excellent protection from the weather for both livestock and wildlife, it is not capable of supporting large numbers of wildlife and livestock due to decreased production.

## RANGELAND INTERPRETATIONS

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This vegetation state is resistant to change. A significant reduction of juniper/pine can only be accomplished through timber harvest or crown fire. The vegetation in the understory is capable of enduring fire; however, very hot crown fires will have a detrimental effect to the plant community. Reclamation of juniper/pine dominated areas can be costly and prove to be temporary without proper management (i.e., prescribed burning, and prescribed grazing).

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: SD6011

Growth curve name: Pierre Shale Plains, heavy conifer canopy.

Growth curve description: Mature ponderosa pine/juniper overstory.

JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1	3	7	11	24	27	12	5	4	3	2	1

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

- Wildfire (hot, crown fires) will move this plant community to the *Western Wheatgrass/Bluegrass/Annuals Plant Community*.
- Removal of juniper/pine by timber harvest will allow the understory to develop and convert to the *Western Wheatgrass/Bluegrass/Annuals Plant Community*.

### **Threeawn/Annuals Plant Community**

This plant community developed under continuous heavy grazing and/or disturbance. The potential plant community is made up of approximately 60-80% grasses and grass-like species, 10-20% forbs and 5-20% shrubs. The dominant grasses include red threeawn, annual brome grasses, and Scribner panicum. Other grasses may include little bluestem, blue grama, buffalograss, sedges, western wheatgrass, and sixweeks fescue. The dominant forbs include fringed sagewort, fetid marigold, western ragweed, pussytoes, prostrate verbena and other annual invader-like species. Other plant species, from adjacent ecological sites, can become minor components of this plant community. This plant community is susceptible to invasion of Canada thistle and other non-native species because of the relatively high percent of bare ground. Compared to the Western Wheatgrass/Needleandthread Plant Community, red threeawn, annual brome grasses, and percent of bare ground has increased. 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. Many annual and perennial forbs, including native and non-native species have invaded the site. Plant diversity is low.

This plant community is very resistant to change because of the loss of plant diversity and overall soil disturbance. It is very susceptible to invasion of non-native plant species. Soil erosion is potentially very high because of the bare ground and shallow rooted herbaceous plant community. Water runoff will increase and infiltration will decrease due to animal related soil compaction and loss of root mass due to low plant diversity and vigor.

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. This site can be renovated to improve the production capability, however if management changes are not made the vegetation could revert back to a threeawn/annual community.

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: SD6003

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

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

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

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

- Under long-term prescribed grazing, including adequate recovery periods, this plant community will move through the successional stages leading to the *Western Wheatgrass/Needleandthread Plant Community*. Depending on the slope, aspect, and size, and if adequate perennial plants exist, this change can occur more rapidly. This method will take a long period of time (10+ years) and intensive management.
- Mechanical treatment such as interseeding or chiseling will help improve the productivity of this site. This will be the fastest way to return to a productive site. The landowner can plant a variety of different species he/she deems to be desirable. This pathway will not take you back to the *Western Wheatgrass/Needleandthread Plant Community*.

### Go-back Land

The Go-back plant community can be reached whenever severe mechanical disturbance occurs (e.g., tilled and abandoned land, either past or present). During the early successional stages, the species that mainly dominate are annual grasses and forbs, later being replaced by both native and introduced perennials. The species vary greatly, sometimes being dominated by threeawn, annual brome, crested wheatgrass, buffalograss, dropseeds, broom snakeweed, verbena, sweetclover, mullein, and non-native thistles. Other plants that commonly occur on the site include western wheatgrass, deathcamas, prickly lettuce, marestail, kochia, foxtail and sunflowers. Bare ground is prevalent due to the loss of organic matter and lower overall soil health.

### Renovated Sod Vegetation State

An altered vegetation community can be achieved through mechanical renovation. Renovation creates microrelief that alters the water cycle by increasing infiltration and decreasing runoff. The renovation reduces the sod-bound conditions, increasing the vegetative production potential. These factors favor cool season species such as western wheatgrass, green needlegrass, and a variety of forbs.

The renovated **Western Wheatgrass/Buffalograss/Blue Grama Plant Community** will have similar plant composition and growth curve characteristics as the Blue Grama/Buffalograss/Western Wheatgrass Plant Community or possibly the HCPC. However, the production will likely be higher, depending on the degree of alteration. Proper grazing management must be implemented to maintain this plant community.

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

- Heavy, continuous season-long grazing will shift this plant community to the renovated *Buffalograss/Blue Grama Sod Plant Community*. Proper grazing management must be included in order to derive the benefits of renovation.

The renovated **Buffalograss/Blue Grama Sod Plant Community** is similar to the non-renovated Blue Grama/Buffalograss Plant Community in most respects. The main difference is the microrelief created by the renovation.

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

- Mechanical renovation (specifically contour furrowing), or prescribed grazing will move this plant community to the renovated *Western Wheatgrass/Buffalograss/Blue Grama Plant Community*. Proper grazing management must be included in order to derive the benefits of renovation.

## **Ecological Site Interpretations**

### **Animal Community – Wildlife Interpretations**

-- Under Development --

**Western Wheatgrass/Needleandthread Plant Community:**

**Blue Grama/Buffalograss/Western Wheatgrass Plant Community:**

**Blue Grama/Buffalograss Sod Plant Community:**

**Threeawn/Annuals Plant Community:**

**Western Wheatgrass/Bluegrass/Annuals Plant Community:**

**Juniper/Ponderosa Pine Plant Community:**

**Go-back Land Plant Community:**

**Western Wheatgrass/Buffalograss/Blue Grama Plant Community (Renovated):** See the description for the Blue Grama/Buffalograss/Western Wheatgrass Plant Community.

**Buffalograss/Blue Grama Sod Plant Community (Renovated):** See the description for the Blue Grama/Buffalograss Sod Plant Community.

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

Common Name	Cattle	Sheep	Horses	Deer	Antelope	Bison	Elk
<b>Grasses &amp; Grass-likes</b>							
big bluestem	U D P D	U U D U	U D P D	U D U U	U D U U	U D P D	U D P D
blue grama	U D P D	D P P D	U D P U	D P P D	D P P D	U D P U	U D P U
buffalograss	U U P D	U U P D	U U D U	N U D U	N U D U	U U D U	U U D U
green needlegrass	U P U D	N P N P	U P U D	N P N P	N P N P	U P U D	U P U D
little bluestem	U D D U	U U D U	U D D U	N D N N	N D N N	U D D U	U D D U
needleandthread	U D U D	N D N U	U D U D	N D N U	N D N U	U D U D	U D U D
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
sedge	U P U D	U P U D	U D U D	U D U D	U D U D	U D U D	U D U D
sideoats grama	U D P D	U P D D	U D P U	U P D U	U P D U	U D P U	U D P U
thickspike wheatgrass	U D D U	U D U U	U D D U	N D N N	N D N N	U D D U	U D D U
threeawn	N N N N	N N N N	N N N N	N N N N	N N N N	N N N N	N N N N
western wheatgrass	U P D D	U D U U	U P D U	N D N N	N D N N	U P D U	U P D U
<b>Forbs</b>							
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
dotted gayfeather	U U D U	U P P U	U U D U	U P P U	U P P U	U U D U	U P P U
false boneset	U U D U	N D U N	U U D U	N D U N	N D U N	U U D U	N D U N
false gromwell	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
green sagewort	U U U U	U U U U	U U U U	U U U U	U U U U	U U U U	U U U U
gromwell	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
milkvetch	U U U U	U D U U	U U U U	U D U U	U D U U	U U U U	U D U U
penstemon	U U U U	U P P U	U U U U	U P P U	U P P U	U U U U	U P P U
prairie coneflower	U U D U	U P P U	U U D U	U P P U	U P P U	U U D U	U P P U
purple coneflower	U U D U	U P P U	U U D U	U P P U	U P P U	U U D U	U P P U
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 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
spiderwort	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
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
verbena	U U D U	U U U U	U U D U	U U U U	U U U U	U U D U	U U U U
western ragweed	U U U U	U U U U	U U U U	N N N N	N N N N	U U U U	N N N N
<b>Shrubs</b>							
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
fringed sagewort	U U U U	U U U U	U U U U	U D D U	U P P D	U U U U	U U U D
leadplant	U P D U	U P D U	U P D U	U P D U	U P D U	U P D U	U P D U
rose	U D D U	U D D U	U D D U	U D D U	U D D U	U D D U	U D D U
snowberry	U U U U	U U U U	U U U U	D U D D	U U U U	U U U U	D U U U

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

† Quarters: 1 – Jan., Feb., Mar.; 2 – Apr., May, Jun.; 3 – Jul., Aug., Sep.; 4 – Oct., Nov., Dec.

## Animal Community – Grazing Interpretations

The following table lists annual, suggested initial stocking rates with average growing conditions. These are conservative estimates that should be used only as guidelines in the initial stages of conservation planning. Often, the current plant composition does not entirely match any particular plant community (as described in this ecological site description). Because of this a resource inventory is necessary to document plant composition and production. More accurate carrying capacity estimates should eventually be calculated using the following stocking rate information along with animal preference data and actual stocking records, particularly when grazers other than cattle are involved. With consultation of the land manager, more intensive grazing management may result in improved harvest efficiencies and increased carrying capacity.

<b>Plant Community</b>	<b>Average Annual Production (lbs./acre, air-dry)</b>	<b>Stocking Rate* (AUM/acre)</b>
Western Wheatgrass/Needleandthread (HCPC)	2200	0.60 – 0.70
Blue Grama/Buffalograss/Western Wheatgrass	1500	0.45 – 0.53
Western Wheatgrass/Bluegrass/Annuals	1600	**
Blue Grama/Buffalograss Sod	800	0.20 – 0.30
Renovated Western Wheatgrass/Green Needlegrass/ Buffalograss/Blue Grama	2500	0.80**
Renovated Buffalograss/Blue Grama	900	0.30**
Juniper/Ponderosa Pine	800	**
Threeawn/Annuals	700	0.12 – 0.18**

\* Based on 790 lbs./acre (air-dry weight) per Animal Unit Month (AUM), and on 25% harvest efficiency (refer to USDA NRCS, National Range and Pasture Handbook).

\*\* Highly variable; stocking rate needs to be determined on site.

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 B and C. Infiltration is generally moderate, and runoff potential varies from low to moderate depending on soil hydrologic group, slope and ground cover. In many cases, areas with greater than 75% ground cover have the greatest potential for high infiltration and lower runoff. An exception would be where shortgrasses form a strong sod and dominate the site. Normally areas where ground cover is less than 50% have the greatest potential to have reduced infiltration and higher runoff (refer to Section 4, NRCS National Engineering Handbook for runoff quantities and hydrologic curves).

## Recreational Uses

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

## Wood Products

**Other Products**

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

**Supporting Information****Associated Sites**

- (060AY024SD) – Shallow Loamy
- (060AY020SD) – Loamy Overflow
- (060AY009SD) – Sandy
- (060AY012SD) – Thin Upland
- (060AY040SD) – Clayey 16-18" P.Z.

**Similar Sites**

- (060AY040SD) – Clayey 16-18" P.Z.  
[green needlegrass dominant; needleandthread minor component]
- (060AY020SD) – Loamy Overflow  
[less needleandthread; more big bluestem; more productive]

**Inventory Data References**

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

<u>Data Source</u>	<u>Number of Records</u>	<u>Sample Period</u>	<u>State</u>	<u>County</u>
SCS-RANGE-417	3	1981 – 1989	SD	Pennington

**State Correlation**

This site has been correlated between Nebraska and South Dakota in MLRA 60A.

**Field Offices**

Belle Fourche, SD	Custer, SD	Martin, SD	Rapid City, SD	Sturgis, SD
Chadron, NE	Hot Springs, SD	Pine Ridge, SD	Rushville, NE	Wall, SD

**Relationship to Other Established Classifications**

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

## Other References

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

USDA, NRCS. National Water and Climate Center, 101 SW Main, Suite 1600, Portland, OR 97204-3224. (<http://wcc.nrcs.usda.gov>)

USDA, NRCS. National Range and Pasture Handbook, September 1997

USDA, NRCS. National Soil Information System, Information Technology Center, 2150 Centre Avenue, Building A, Fort Collins, CO 80526. (<http://nasis.nrcs.usda.gov>)

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

USDA, NRCS. 2001. The PLANTS Database, Version 3.1 (<http://plants.usda.gov>). National Plant Data Center, Baton Rouge, LA 70874-4490 USA.

USDA, NRCS, Various Published Soil Surveys.

## Site Description Approval

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NE, State Range Management Specialist

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Date

\_\_\_\_\_  
SD, State Range Management Specialist

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Date