

**United States Department of Agriculture
Natural Resources Conservation Service**

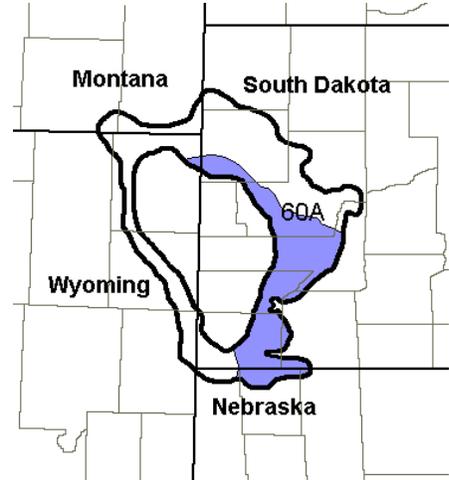
Ecological Site Description

Site Type: Rangeland

Site Name: Clayey 16-18" P.Z.

Site ID: R060AY040SD

Major Land Resource Area: 60A – Pierre Shale Plains



Physiographic Features

This site occurs on gently undulating to rolling uplands.

Landform: fan, plain, hill

Aspect: N/A

	<u>Minimum</u>	<u>Maximum</u>
Elevation (feet):	2500	4300
Slope (percent):	0	30
Water Table Depth (inches):	None	None
Flooding:		
Frequency:	None	None
Duration:	None	None
Ponding:		
Depth (inches):	None	None
Frequency:	None	None
Duration:	None	None
Runoff Class:	Medium	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.

RANGELAND INTERPRETATIONS

Page 2

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>
Frost-free period (days):	124	135
Freeze-free period (days):	143	154
Mean Annual Precipitation (inches):	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 shale, residuum from shale or alluvium. The surface layer is 3 to 11 inches thick. The texture of the profile ranges from silty clay loam to clay. The soils have a low to moderate infiltration rate. This site should show slight to no evidence of rills, wind scoured areas or pedestalled plants. Water flow paths are broken, irregular in appearance or discontinuous with numerous debris dams or vegetative barriers. The soil surface is stable and intact. Sub-surface soil layers are generally not restrictive to water movement and root penetration. These soils are susceptible to wind and water erosion. The hazard of water erosion increases on slopes greater than about 6 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: shale
Parent Material Origin: shale, clayey
Surface Texture: silt loam, silty clay 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): 0-13
Subsurface Fragments $>$ 3" (% Volume): 0-6

	<u>Minimum</u>	<u>Maximum</u>
Drainage Class:	well	well
Permeability Class:	very slow	slow
Depth (inches):	20	80
Electrical Conductivity (mmhos/cm)*:	0	8
Sodium Absorption Ratio*:	0	13
Soil Reaction (1:1 Water)*:	6.1	9.0
Soil Reaction (0.1M CaCl₂)*:	NA	NA
Available Water Capacity (inches)*:	4	7
Calcium Carbonate Equivalent (percent)*:	0	15

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

Plant Communities

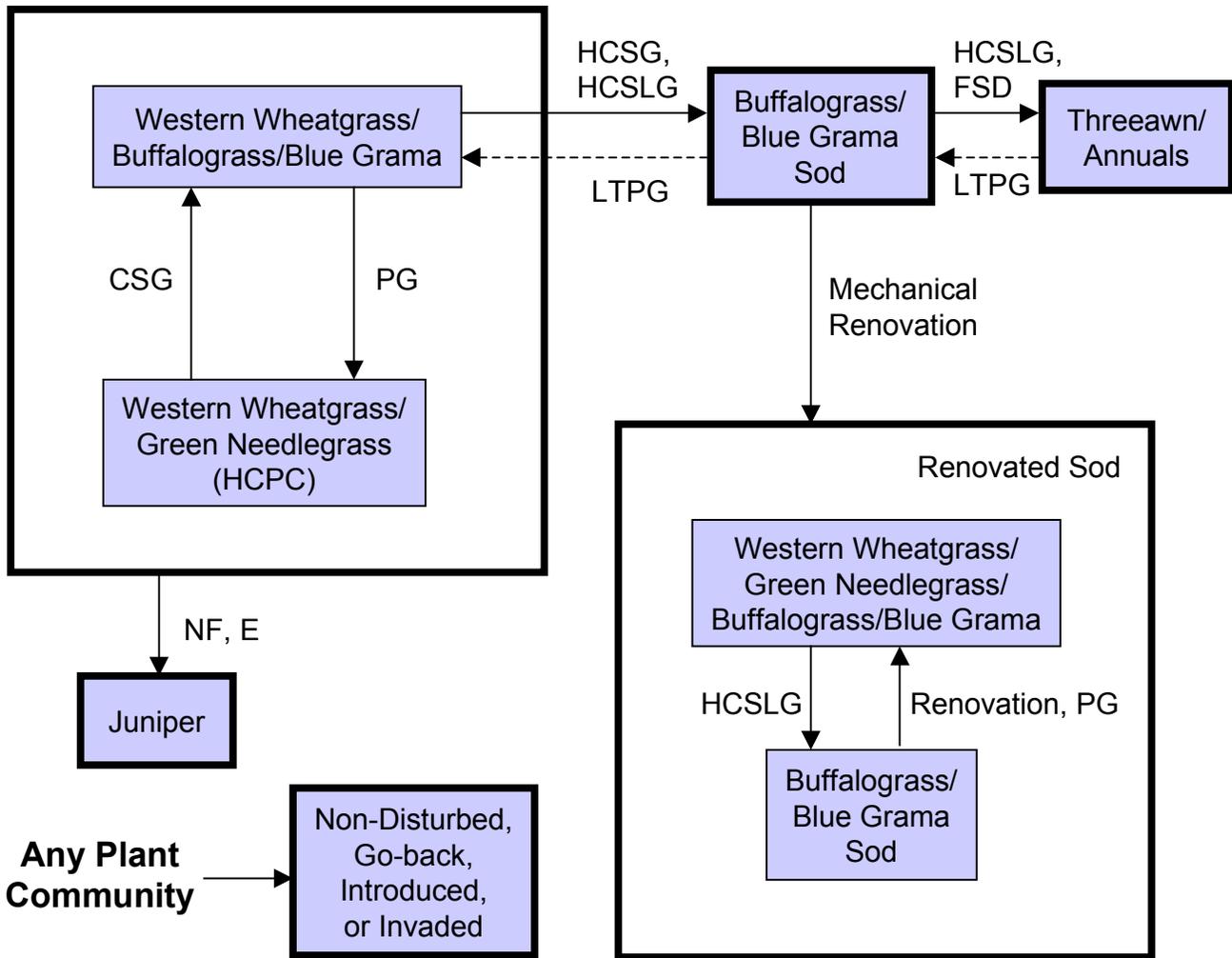
Ecological Dynamics of the Site:

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.

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 transitions between communities. The ecological processes are discussed in more detail in the plant community narratives following the diagram.

Plant Communities and Transitional Pathways



CSG - Continuous seasonal grazing; **CSLG** - Continuous season-long grazing; **E** - Encroachment; **HCPC** - Historical Climax Plant Community; **HCSG** - Heavy continuous seasonal grazing; **HCSLG** - Heavy continuous season-long grazing; **LTPG** - Long-term prescribed grazing; **NF** - No fire; **PG** - Prescribed Grazing; Dashed lines signify transitions returning across a threshold, which typically require significant inputs or long periods of time.

Plant Community Composition and Group Annual Production

COMMON/GROUP NAME	SCIENTIFIC NAME	SYMBOL	Western Wheatgrass/ Green Needlegrass (HCPC)		
			Group	lbs./acre	% Comp
GRASSES & GRASS-LIKES				1700 - 1900	85 - 95
COOL-SEASON MID GRASSES			1	1400 - 1700	70 - 85
western wheatgrass	Pascopyrum smithii	PASM	1	700 - 1100	35 - 55
green needlegrass	Nassella viridula	NAV14	1	500 - 700	25 - 35
porcupine grass	Hesperostipa spartea	HESP11	1	0 - 100	0 - 5
needleandthread	Hesperostipa comata ssp. comata	HECOC8	1	0 - 100	0 - 5
SHORT GRASSES & GRASS-LIKES			2	100 - 300	5 - 15
blue grama	Bouteloua gracilis	BOGR2	2	40 - 200	2 - 10
buffalograss	Buchloe dactyloides	BUDA	2	0 - 100	0 - 5
prairie junegrass	Koeleria macrantha	KOMA	2	20 - 100	1 - 5
Sandberg bluegrass	Poa secunda	POSE	2	0 - 100	0 - 5
sedge	Carex spp.	CAREX	2	20 - 100	1 - 5
WARM-SEASON TALL/MID GRASSES			3	200 - 400	10 - 20
sideoats grama	Bouteloua curtipendula	BOCU	3	200 - 400	10 - 20
big bluestem	Andropogon gerardii	ANGE	3	0 - 200	0 - 10
little bluestem	Schizachyrium scoparium	SCSC	3	0 - 100	0 - 5
WARM-SEASON TALL/MID GRASSES			4	0 - 100	0 - 5
other perennial grasses		2GP	4	0 - 100	0 - 5
other annual grasses		2GA	4	0 - 100	0 - 5
FORBS			6	100 - 200	5 - 10
American vetch	Vicia americana	VIAM	6	0 - 40	0 - 2
aster	Aster spp.	ASTER	6	0 - 40	0 - 2
biscuitroot	Lomatium spp.	LOMAT	6	0 - 40	0 - 2
bluebells	Mertensia spp.	MERTE	6	0 - 40	0 - 2
cudweed sagewort	Artemisia ludoviciana	ARLU	6	0 - 40	0 - 2
cutleaf ironplant	Machaeranthera pinnatifida	MAPI	6	0 - 40	0 - 2
deathcamas	Zigadenus spp.	ZIGAD	6	0 - 40	0 - 2
deervetch	Lotus unifoliolatus var. unifoliolatus	LOUNU	6	0 - 40	0 - 2
dotted gayfeather	Liatris punctata	LIPU	6	0 - 40	0 - 2
false boneset	Brickellia eupatorioides	BREU	6	0 - 40	0 - 2
goldenrod	Solidago spp.	SOLID	6	0 - 40	0 - 2
milkvetch	Astragalus spp.	ASTRA	6	0 - 40	0 - 2
penstemon	Penstemon spp.	PENST	6	0 - 40	0 - 2
prairie coneflower	Ratibida columnifera	RACO3	6	0 - 40	0 - 2
pussytoes	Antennaria spp.	ANTEN	6	0 - 40	0 - 2
scarlet gaura	Gaura coccinea	GACO5	6	0 - 40	0 - 2
scarlet globemallow	Sphaeralcea coccinea	SPCO	6	0 - 40	0 - 2
scurfpea	Psoralegium spp.	PSORA2	6	0 - 40	0 - 2
spiny phlox	Phlox hoodii	PHHO	6	0 - 40	0 - 2
thistle	Cirsium spp.	CIRSI	6	0 - 40	0 - 2
western ragweed	Ambrosia psilostachya	AMPS	6	0 - 40	0 - 2
wild onion	Allium spp.	ALLIU	6	0 - 40	0 - 2
wild parsley	Musineon divaricatum	MUDI	6	0 - 40	0 - 2
yarrow	Achillea spp.	ACHIL	6	0 - 40	0 - 2
other perennial forbs		2FP	6	0 - 40	0 - 2
SHRUBS			7	40 - 100	2 - 5
cactus	Opuntia spp.	OPUNT	7	0 - 20	0 - 1
rose	Rosa spp.	ROSA5	7	0 - 40	0 - 2
fringed sagewort	Artemisia frigida	ARFR4	7	0 - 20	0 - 1
snowberry	Symphoricarpos spp.	SYMPH	7	0 - 40	0 - 2
other shrubs		2SHRUB	7	0 - 40	0 - 2

Annual Production lbs./acre	LOW	RV	HIGH
GRASSES & GRASS-LIKES	1070 -	1780	-2490
FORBS	95 -	150	-205
SHRUBS	35 -	70	-105
TOTAL	1200 -	2000	-2800

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

Plant Community Composition and Group Annual Production

COMMON/GROUP NAME	SYMBOL	Western Wheatgrass/ Green Needlegrass (HCPC)			Western Wheatgrass/ Buffalograss/Blue Grama			Buffalograss/Blue Grama Sod		
		Grp	lbs./acre	% Comp	Grp	lbs./acre	% Comp	Grp	lbs./acre	% Comp
GRASSES & GRASS-LIKES			1700 - 1900	85 - 95		1440 - 1620	80 - 90		560 - 630	80 - 90
COOL-SEASON MID GRASSES		1	1400 - 1700	70 - 85	1	360 - 720	20 - 40	1	70 - 175	10 - 25
western wheatgrass	PASM	1	700 - 1100	35 - 55	1	360 - 630	20 - 35	1	70 - 105	10 - 15
green needlegrass	NAV14	1	500 - 700	25 - 35	1	90 - 180	5 - 10	1	0 - 35	0 - 5
porcupine grass	HESP11	1	0 - 100	0 - 5	1	0 - 90	0 - 5	1	0 - 14	0 - 2
needleandthread	HECOC8	1	0 - 100	0 - 5	1	0 - 90	0 - 5	1	35 - 70	5 - 10
SHORT GRASSES & GRASS-LIKES		2	100 - 300	5 - 15	2	270 - 720	15 - 40	2	280 - 420	40 - 60
blue grama	BOGR2	2	40 - 200	2 - 10	2	180 - 450	10 - 25	2	140 - 210	20 - 30
buffalograss	BUDA	2	0 - 100	0 - 5	2	90 - 360	5 - 20	2	140 - 245	20 - 35
prairie junegrass	KOMA	2	20 - 100	1 - 5	2	18 - 90	1 - 5	2	7 - 35	1 - 5
Sandberg bluegrass	POSE	2	0 - 100	0 - 5	2	0 - 90	0 - 5	2	0 - 35	0 - 5
sedge	CAREX	2	20 - 100	1 - 5	2	90 - 180	5 - 10	2	35 - 105	5 - 15
WARM-SEASON TALL/MID GRASS		3	200 - 400	10 - 20	3	90 - 180	5 - 10	3	0 - 35	0 - 5
sideoats grama	BOCU	3	200 - 400	10 - 20	3	90 - 180	5 - 10	3	0 - 35	0 - 5
big bluestem	ANGE	3	0 - 200	0 - 10	3	0 - 90	0 - 5			
little bluestem	SCSC	3	0 - 100	0 - 5	3	0 - 54	0 - 3			
OTHER NATIVE GRASSES		4	0 - 100	0 - 5	4	0 - 90	0 - 5	4	0 - 56	0 - 8
threeawn	ARIST	4			4	0 - 90	0 - 5	4	0 - 35	0 - 5
other perennial grasses	2GP	4	0 - 100	0 - 5	4	0 - 90	0 - 5	4	0 - 35	0 - 5
other annual grasses	2GA	4	0 - 100	0 - 5	4	0 - 90	0 - 5	4	0 - 35	0 - 5
NON-NATIVE GRASSES		5			5	0 - 126	0 - 7	5	0 - 35	0 - 5
cheatgrass	BRTE				5	0 - 90	0 - 5	5	0 - 35	0 - 5
Kentucky bluegrass	POPR				5	0 - 126	0 - 7	5	0 - 35	0 - 5
FORBS/CRYPTOGAMS		6	100 - 200	5 - 10	6	90 - 180	5 - 10	6	35 - 70	5 - 10
American vetch	VIAM	6	0 - 40	0 - 2	6	0 - 36	0 - 2	6	0 - 14	0 - 2
aster	ASTER	6	0 - 40	0 - 2	6	0 - 54	0 - 3	6	0 - 21	0 - 3
biscuitroot	LOMAT	6	0 - 40	0 - 2	6	0 - 54	0 - 3	6	0 - 21	0 - 3
bluebells	MERTE	6	0 - 40	0 - 2	6	0 - 18	0 - 1			
cutweed sagewort	ARLU	6	0 - 40	0 - 2	6	0 - 36	0 - 2	6	0 - 14	0 - 2
curlycup gumweed	GRSQ				6	0 - 36	0 - 2	6	0 - 14	0 - 2
cutleaf ironplant	MAPI	6	0 - 40	0 - 2	6	0 - 36	0 - 2	6	0 - 14	0 - 2
deathcamas	ZIGAD	6	0 - 40	0 - 2	6	0 - 36	0 - 2	6	0 - 14	0 - 2
deervetch	LOUNU	6	0 - 40	0 - 2	6	0 - 54	0 - 3	6	0 - 21	0 - 3
dotted gayfeather	LIPU	6	0 - 40	0 - 2	6	0 - 36	0 - 2	6	0 - 14	0 - 2
false boneset	BREU	6	0 - 40	0 - 2	6	0 - 18	0 - 1			
fetid marigold	DYPA							6	0 - 7	0 - 1
goldenpea	THRH				6	0 - 36	0 - 2	6	0 - 14	0 - 2
goldenrod	SOLID	6	0 - 40	0 - 2	6	0 - 36	0 - 2	6	0 - 14	0 - 2
milkvetch	ASTRA	6	0 - 40	0 - 2	6	0 - 36	0 - 2	6	0 - 14	0 - 2
penstemon	PENST	6	0 - 40	0 - 2	6	0 - 36	0 - 2	6	0 - 14	0 - 2
prairie coneflower	RAC03	6	0 - 40	0 - 2	6	0 - 36	0 - 2	6	0 - 14	0 - 2
pussytoes	ANTEN	6	0 - 40	0 - 2	6	0 - 36	0 - 2	6	0 - 14	0 - 2
scarlet gaura	GACO5	6	0 - 40	0 - 2	6	0 - 18	0 - 1			
scarlet globemallow	SPCO	6	0 - 40	0 - 2	6	0 - 54	0 - 3	6	0 - 21	0 - 3
scurfpea	PSORA2	6	0 - 40	0 - 2	6	0 - 36	0 - 2	6	0 - 14	0 - 2
spiny phlox	PHHO	6	0 - 40	0 - 2	6	0 - 36	0 - 2	6	0 - 14	0 - 2
sweetclover	MELIL				6	0 - 90	0 - 5	6	0 - 70	0 - 10
thistle	CIRSI	6	0 - 40	0 - 2	6	0 - 36	0 - 2	6	0 - 14	0 - 2
verbena	VERBE				6	0 - 18	0 - 1	6	0 - 14	0 - 2
western ragweed	AMPS	6	0 - 40	0 - 2	6	0 - 36	0 - 2	6	0 - 14	0 - 2
wild onion	ALLIU	6	0 - 40	0 - 2	6	0 - 36	0 - 2	6	0 - 14	0 - 2
wild parsley	MUDI	6	0 - 40	0 - 2	6	0 - 54	0 - 3	6	0 - 21	0 - 3
yarrow	ACHIL	6	0 - 40	0 - 2	6	0 - 36	0 - 2	6	0 - 14	0 - 2
other perennial forbs	2FP	6	0 - 40	0 - 2	6	0 - 36	0 - 2	6	0 - 14	0 - 2
clubmoss	SEDE2				6	0 - 18	0 - 1	6	0 - 28	0 - 4
SHRUBS		7	40 - 100	2 - 5	7	90 - 180	5 - 10	7	35 - 70	5 - 10
broom snakeweed	GUSA2				7	0 - 54	0 - 3	7	0 - 35	0 - 5
cactus	OPUNT	7	0 - 20	0 - 1	7	0 - 90	0 - 5	7	14 - 56	2 - 8
rose	ROSA5	7	0 - 40	0 - 2	7	0 - 54	0 - 3	7	0 - 14	0 - 2
fringed sagewort	ARFR4	7	0 - 20	0 - 1	7	0 - 90	0 - 5	7	0 - 35	0 - 5
snowberry	SYMPH	7	0 - 40	0 - 2	7	0 - 36	0 - 2	7	0 - 14	0 - 2
other shrubs	2SHRUB	7	0 - 40	0 - 2	7	0 - 36	0 - 2	7	0 - 14	0 - 2
TREES		8			8			8		
eastern redcedar	JUM									
Rocky Mountain juniper	JUSC2									
Annual Production lbs./acre			LOW RV HIGH		LOW RV HIGH		LOW RV HIGH		LOW RV HIGH	
GRASSES & GRASS-LIKES			1070 - 1780 - 2490		630 - 1530 - 2030		340 - 595 - 750			
FORBS/CRYPTOGAMS			95 - 150 - 205		85 - 135 - 185		30 - 53 - 75			
SHRUBS			35 - 70 - 105		85 - 135 - 185		30 - 53 - 75			
TREES										
TOTAL			1200 - 2000 - 2800		800 - 1800 - 2400		400 - 700 - 900			

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 (HCPC)			Threeawn/Annuals			Juniper		
		Grp	lbs./acre	% Comp	Grp	lbs./acre	% Comp	Grp	lbs./acre	% Comp
GRASSES & GRASS-LIKES			1700 - 1900	85 - 95		350 - 595	50 - 85		750 - 1050	50 - 70
COOL-SEASON MID GRASSES		1	1400 - 1700	70 - 85	1	7 - 70	1 - 10	1	450 - 750	30 - 50
western wheatgrass	PASM	1	700 - 1100	35 - 55	1	7 - 70	1 - 10	1	300 - 600	20 - 40
green needlegrass	NAV14	1	500 - 700	25 - 35	1	0 - 7	0 - 1	1	300 - 600	20 - 40
porcupine grass	HESP11	1	0 - 100	0 - 5				1	0 - 150	0 - 10
needleandthread	HECOC8	1	0 - 100	0 - 5	1	0 - 14	0 - 2	1	75 - 225	5 - 15
SHORT GRASSES & GRASS-LIKES		2	100 - 300	5 - 15	2	35 - 245	5 - 35	2	75 - 225	5 - 15
blue grama	BOGR2	2	40 - 200	2 - 10	2	7 - 105	1 - 15	2	30 - 150	2 - 10
buffalograss	BUDA	2	0 - 100	0 - 5	2	7 - 105	1 - 15	2	0 - 75	0 - 5
prairie junegrass	KOMA	2	20 - 100	1 - 5	2	0 - 21	0 - 3	2	15 - 75	1 - 5
Sandberg bluegrass	POSE	2	0 - 100	0 - 5	2	0 - 7	0 - 1	2	0 - 75	0 - 5
sedge	CAREX	2	20 - 100	1 - 5	2	7 - 35	1 - 5	2	30 - 120	2 - 8
WARM-SEASON TALL/MID GRASSES		3	200 - 400	10 - 20	3	0 - 21	0 - 3	3	75 - 225	5 - 15
sideoats grama	BOCU	3	200 - 400	10 - 20	3	0 - 14	0 - 2	3	75 - 150	5 - 10
big bluestem	ANGE	3	0 - 200	0 - 10				3	0 - 75	0 - 5
little bluestem	SCSC	3	0 - 100	0 - 5	3	0 - 7	0 - 1	3	0 - 75	0 - 5
OTHER NATIVE GRASSES		4	0 - 100	0 - 5	4	70 - 245	10 - 35	4	0 - 75	0 - 5
threeawn	ARIST				4	70 - 245	10 - 35	4	0 - 45	0 - 3
other perennial grasses	2GP	4	0 - 100	0 - 5	4	0 - 14	0 - 2	4	0 - 75	0 - 5
other annual grasses	2GA	4	0 - 100	0 - 5	4	0 - 35	0 - 5	4	0 - 75	0 - 5
NON-NATIVE GRASSES		5			5	7 - 70	1 - 10	5	75 - 150	5 - 10
cheatgrass	BRTE				5	7 - 70	1 - 10	5	30 - 120	2 - 8
Kentucky bluegrass	POPR				5	0 - 14	0 - 2	5	0 - 105	0 - 7
FORBS/CRYPTOGRAMS		6	100 - 200	5 - 10	6	70 - 175	10 - 25	6	75 - 150	5 - 10
American vetch	VIAM	6	0 - 40	0 - 2						
aster	ASTER	6	0 - 40	0 - 2	6	0 - 14	0 - 2	6	0 - 45	0 - 3
biscuitroot	LOMAT	6	0 - 40	0 - 2				6	0 - 30	0 - 2
bluebells	MERTE	6	0 - 40	0 - 2						
cutweed sagewort	ARLU	6	0 - 40	0 - 2	6	14 - 35	2 - 5	6	0 - 60	0 - 4
curlycup gumweed	GRSQ				6	0 - 35	0 - 5			
cutleaf ironplant	MAPI	6	0 - 40	0 - 2	6	0 - 7	0 - 1	6	0 - 30	0 - 2
deathcamas	ZIGAD	6	0 - 40	0 - 2				6	0 - 30	0 - 2
deervetch	LOUNU	6	0 - 40	0 - 2				6	0 - 30	0 - 2
dotted gayfeather	LIPU	6	0 - 40	0 - 2	6	0 - 7	0 - 1	6	0 - 45	0 - 3
false boneset	BREU	6	0 - 40	0 - 2						
fetid marigold	DYPA				6	14 - 70	2 - 10			
goldenpea	THRH							6	0 - 30	0 - 2
goldenrod	SOLID	6	0 - 40	0 - 2				6	0 - 45	0 - 3
milkvetch	ASTRA	6	0 - 40	0 - 2				6	0 - 30	0 - 2
penstemon	PENST	6	0 - 40	0 - 2				6	0 - 30	0 - 2
prairie coneflower	RACO3	6	0 - 40	0 - 2	6	0 - 7	0 - 1	6	0 - 30	0 - 2
pussytoes	ANTEN	6	0 - 40	0 - 2	6	0 - 35	0 - 5	6	0 - 30	0 - 2
scarlet gaura	GACO5	6	0 - 40	0 - 2						
scarlet globemallow	SPCO	6	0 - 40	0 - 2	6	0 - 7	0 - 1	6	0 - 30	0 - 2
scurfpea	PSORA2	6	0 - 40	0 - 2				6	0 - 45	0 - 3
spiny phlox	PHHO	6	0 - 40	0 - 2	6	0 - 7	0 - 1	6	0 - 30	0 - 2
sweetclover	MELIL				6	0 - 70	0 - 10	6	0 - 75	0 - 5
thistle	CIRSI	6	0 - 40	0 - 2				6	0 - 30	0 - 2
verbena	VERBE				6	7 - 35	1 - 5	6	0 - 15	0 - 1
western ragweed	AMPS	6	0 - 40	0 - 2	6	7 - 35	1 - 5	6	0 - 30	0 - 2
wild onion	ALLIU	6	0 - 40	0 - 2				6	0 - 30	0 - 2
wild parsley	MUDI	6	0 - 40	0 - 2				6	0 - 30	0 - 2
yarrow	ACHIL	6	0 - 40	0 - 2	6	0 - 14	0 - 2	6	0 - 45	0 - 3
other perennial forbs	2FP	6	0 - 40	0 - 2	6	0 - 14	0 - 2	6	0 - 45	0 - 3
clubmoss	SEDE2				6	0 - 7	0 - 1			
SHRUBS		7	40 - 100	2 - 5	7	35 - 175	5 - 25	7	75 - 150	5 - 10
broom snakeweed	GUSA2				7	7 - 70	1 - 10			
cactus	OPUNT	7	0 - 20	0 - 1	7	7 - 70	1 - 10	7	0 - 30	0 - 2
rose	ROSA5	7	0 - 40	0 - 2				7	0 - 60	0 - 4
fringed sagewort	ARFR4	7	0 - 20	0 - 1	7	14 - 105	2 - 15	7	0 - 75	0 - 5
snowberry	SYMPH	7	0 - 40	0 - 2				7	0 - 75	0 - 5
other shrubs	2SHRUB	7	0 - 40	0 - 2	7	0 - 7	0 - 1	7	0 - 60	0 - 4
TREES		8			8			8	75 - 450	5 - 30
eastern redcedar	JUVI							8	75 - 450	5 - 30
Rocky Mountain juniper	JUSC2							8	75 - 450	5 - 30
Annual Production lbs./acre			LOW RV HIGH		LOW RV HIGH		LOW RV HIGH		LOW RV HIGH	
GRASSES & GRASS-LIKES			1070 - 1780 - 2490		305 - 473 - 640		490 - 1013 - 1190			
FORBS/CRYPTOGRAMS			95 - 150 - 205		65 - 123 - 180		70 - 113 - 155			
SHRUBS			35 - 70 - 105		30 - 105 - 180		70 - 113 - 155			
TREES							70 - 263 - 500			
TOTAL			1200 - 2000 - 2800		400 - 700 - 1000		700 - 1500 - 2000			

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/Green Needlegrass Plant Community

The plant community upon which interpretations are primarily based is the Western Wheatgrass/Green Needlegrass 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 85-95% grasses or grass-like plants, 5-10% forbs, and 2-5% shrubs. Cool season grasses dominate this plant community. Major grasses include western wheatgrass and green needlegrass. Other grasses occurring on the site include sideoats grama, blue grama, buffalograss, prairie junegrass and sedge. Significant forbs include scarlet globemallow, wild parsley, biscuitroot, deer vetch, American vetch, and milkvetch. The significant shrubs that occur include cactus and rose.

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). The diversity in plant species allows for high drought tolerance. Moderate or high available water capacity provides a favorable soil-water-plant relationship.

Overall the interpretive plant community has the appearance of being extremely stable, diverse and productive. Litter normally falls in place, and does not occur in excess amounts. Most plant species have a wide range of age classes represented and reproduction is not limited. Plant roots occupy most of the soil profile, which provides for soil stability and promotes infiltration.

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

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

- Continuous seasonal grazing during the active growing period of cool season plants will lead to the *Western Wheatgrass/Buffalograss/Blue Grama Plant Community*.
- No fire and encroachment from adjacent plant communities containing juniper will move this plant community towards the *Juniper Plant Community*.

Western Wheatgrass/Buffalograss/Blue Grama 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, 5-10% forbs and 5-10% shrubs. The dominant grasses include blue grama, buffalograss, and western and/or thickspike wheatgrass. Other grasses may include green needlegrass, prairie junegrass and Kentucky bluegrass. Significant forbs include scarlet globemallow, wild parsley, biscuitroot, phlox, golden pea, deer vetch, asters, and milkvetch. The significant shrubs that occur include cactus, broom snakeweed and rose.

Compared to the Historic Climax Plant Community, the shortgrass species including blue grama and buffalograss have increased. The cool season species including western wheatgrass and green needlegrass have decreased in composition. Annual bromes, curlycup gumweed, sweetclover 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 very adapted to grazing; however, the mid grass species and the more palatable forbs will decrease in the community through continuous seasonal grazing. If the herbaceous component is intact, it tends to be resilient if disturbance is not long-term. 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 on-site soil erosion. However, off-site areas may be affected by increased runoff.

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

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

- Prescribed grazing, which allows for adequate plant recovery periods, will move this plant community to the *Western Wheatgrass/Green Needlegrass Plant Community*. Periods of non-use or deferment may be a management option to reach the HCPC.
- With heavy continuous seasonal grazing this site will move towards the *Buffalograss/Blue Grama Sod Plant Community*. This would be typical of calving/lambing pastures where the unit is continuously utilized during the late winter through spring. This transition will result in decreased forage production and plant species diversity. In addition, with heavy continuous season-long grazing, this plant community will move to the *Buffalograss/Blue Grama Sod Plant Community*. During this transition, the plant community can have the appearance of a mosaic, with sod and mixed grass communities intermingled.
- No fire, and encroachment from adjacent plant communities containing juniper will move this plant community towards the *Juniper Plant Community*.

Buffalograss/Blue Grama Sod Plant Community

This plant community develops under heavy continuous season-long grazing, and with continuous seasonal grazing with concentrated use in the early part of the growing season (as in calving/lambing pastures). It is made up of approximately 80-90% grasses (primarily short, warm season grasses), 5-10% forbs, and 5-10% shrubs.

The dominant grasses include blue grama and buffalograss. Other grasses may include western wheatgrass, prairie junegrass, threeawn, and annual brome. The dominant forbs include slimflower scurfpea, pussytoes, curlycup gumweed and scarlet globemallow. The dominant shrub is plains pricklypear. Compared to the Historic Climax Plant Community, short grasses have increased, and the cool season mid grasses have diminished greatly. Some forbs and cactus have either increased and/or invaded the site. Plant diversity is low. This plant community is very stable. Generally, this plant community will require significant management inputs (i.e., high animal impact, long term prescribed grazing, favorable climatic conditions, etc.) and time to move it towards the Western Wheatgrass/Buffalograss/Blue Grama Plant Community. On-site soil erosion is low. Infiltration is low, and runoff is high. Typically the runoff is very clean because of the low potential for on-site soil erosion. However, off-site areas can be significantly impacted due to the increased runoff.

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

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

- Long-term prescribed grazing and favorable climatic conditions, which allows for adequate plant recovery periods, will move this plant community towards the *Western Wheatgrass/Buffalograss/Blue Grama Plant Community*. Periods of non-use or deferment may be a management option to facilitate this movement.
- Mechanical renovation (specifically contour furrowing) will move this plant community to the renovated *Western Wheatgrass/Green Needlegrass/Buffalograss/Blue Grama Plant Community*. Proper grazing management must be included in order to derive the benefits of renovation.
- Heavy, continuous season-long grazing or frequent and severe defoliation will move this plant community to the *Threeawn/Annuals Plant Community*.

Juniper Plant Community

Historically, juniper (eastern redcedar and Rocky Mountain juniper) was confined to ridges and steep shallow slopes located adjacent to this ecological site. Currently, juniper is expanding on to this site due to the suppression of fire. Juniper canopy is greater than 30% of mature trees. The understory production is made up of about 50-70% grasses and grass-like species, 5-10% forbs, and 10-40% shrubs or trees. Dominant grasses include bluegrass, annual brome and threeawn. Other grasses that occur include western wheatgrass, green needlegrass and prairie junegrass. Forbs commonly found in this community include western ragweed, verbena, cudweed sagewort and pussytoes.

When compared to the HCPC, juniper increases significantly. The grass component decreases dramatically. Total annual production of the understory also decreases significantly. While the juniper 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 forage production. This vegetation state is resistant to change. A significant reduction of juniper can only be accomplished through harvesting 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 dominated areas can be costly and prove to be temporary without proper management (i.e.,

prescribed burning, and prescribed grazing). If the juniper canopy becomes high enough, bare ground and soil erosion will likely increase.

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

The direction this plant community will move is dependent on the canopy cover of the juniper. If the canopy cover is high enough, and the plant community is subjected to a hot, crown fire, the resulting plant community will likely be dominated by early successional species, or by introduced species. If the canopy cover is not closed, proper management, including removal of trees, may return the plant community to near the HCPC or the Western Wheatgrass/Bufalograss/Blue Grama Plant Community.

Threeawn/Annuals Plant Community

This plant community develops where the rangeland is grazed year-round, at high stock densities and/or occupation by prairie dogs. The potential plant community is made up of approximately 50-85% grasses and grass-like species, 10-25% forbs and 5-25% shrubs. The dominant grasses include threeawn and annual brome grasses. Other grasses may include 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 resistant to change back to a higher successional plant community 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.

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: NE6403

Growth curve name: Pine Ridge/Badlands, 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	5	10	20	25	20	10	5	5	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 to the *Buffalograss/Blue Grama Sod Plant Community*.

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/Green Needlegrass/Buffalograss/Blue Grama Plant Community** will have similar plant composition and growth curve characteristics as the Western Wheatgrass/Buffalograss/Blue Grama Plant Community. However, the production will likely be higher, depending on the degree of alteration. Proper grazing management must be implemented to maintain this plant community. Continuous season-long grazing will move this plant community to the renovated Blue Grama/Buffalograss Sod 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 Plant Community** is similar to the non-renovated Buffalograss/Blue Grama Plant Community in most respects. The main difference is the microrelief created by the renovation.

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/Green Needlegrass/Buffalograss/Blue Grama Plant Community*. Proper grazing management must be included in order to derive the benefits of renovation.

Non-Disturbed, Go-back, Introduced, Invaded

This group includes four separate vegetation states that are highly variable in nature. They are derived through four distinct management scenarios, and are not related successionaly. Infiltration, runoff and soil erosion varies depending on the vegetation present on the site.

The **Non-Disturbed** state develops from extended periods of exclusion by large herbivores, fire suppression and lack of other surface disturbance. Plant litter accumulates in large amounts when this community first develops. Litter buildup reduces mature plant vigor and density, and seedling recruitment declines. Eventually litter levels become high enough that plant density decreases. Interspaces are commonly filled by annual forbs, annual grasses, and cryptogams. Typically rhizomatous grasses form small colonies because of a lack of tiller stimulation. While many of the species present in the HCPC also occur here, other species tend to increase or invade such as bluegrass, threeawn, cheatgrass, sweetclover and crested wheatgrass. This plant community can return to a plant community similar to the HCPC with practices such as prescribed burning and/or prescribed grazing.

The **Go-back** state can be reached whenever severe mechanical disturbance (i.e., abandoned farmland) occurs. 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 vegetation on this site varies greatly, sometimes being dominated by threeawn, annual brome, crested wheatgrass, buffalograss, broom snakeweed, sweetclover and non-native thistles. Other plants that commonly occur on the site include western wheatgrass, prickly lettuce, maretail, kochia, squirreltail, foxtail and annual sunflower. If remnant reproductive propagules are present, green needlegrass and western wheatgrass can rapidly occupy this state.

The **Introduced** state is normally those areas seeded to crested wheatgrass, pubescent or intermediate wheatgrass and alfalfa. It requires considerable investment to establish and have a variable life expectancy. They do produce up to 50% more than native range, but their value as forage is somewhat limited due to the single species usually seeded.

The **Invaded** state includes areas that have been invaded by species such as smooth brome, Kentucky bluegrass, crested wheatgrass, non-native thistles, field bindweed, knapweeds, leafy spurge, hoary cress and other introduced species.

Ecological Site Interpretations

Animal Community – Wildlife Interpretations

-- Under Development --

Western Wheatgrass/Green Needlegrass Plant Community:

Western Wheatgrass/Buffalograss/Blue Grama Plant Community:

Buffalograss/Blue Grama Sod Plant Community:

Juniper Plant Community:

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

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

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

Common Name	Cattle	Sheep	Horses	Deer	Antelope	Bison	Elk
Grasses & Grass-likes							
big bluestem	U D P D	U 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
porcupine grass	U P U D	N D N U	U P U D	N D N U	N D N U	U P U D	U P U D
prairie junegrass	U D U D	N D N U	U D U D	N D N U	N D N U	U D U D	U D U D
Sandberg bluegrass	U U U U	U D U U	N U N N	N D N N	N D N N	N U N N	N U N N
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
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
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
aster	U U D U	U U D U	U U D U	U U D U	U U D U	U U D U	U U D 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
bluebells	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
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
cutleaf ironplant	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
deathcamas	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
deervetch	U U U U	U D D U	U U U U	U D D U	U D D U	U U U U	U D 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
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
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
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
spiny phlox	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
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	U U U U	U U U U	N N N N	N N N N	U U U U	N N N N
wild 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
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
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							
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
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
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
snowberry	U U U U	U U U U	U U U U	D U D D	U U U U	U U U U	D U U U

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

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

Animal Community – Grazing Interpretations

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

Plant Community	Average Annual Production (lbs./acre, air-dry)	Stocking Rate* (AUM/acre)
Western Wheatgrass/Green Needlegrass	2000	0.55 – 0.65
Western Wheatgrass/Buffalograss/Blue Grama	1800	0.50 – 0.60
Buffalograss/Blue Grama Sod	700	0.20 – 0.25
Threeawn/Annuals	700	0.20 – 0.25**
Renovated Western Wheatgrass/Green Needlegrass/ Buffalograss/Blue Grama	2500	0.80**
Renovated Buffalograss/Blue Grama	900	0.30**
Juniper	500	0.16**

* 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 C and D. Infiltration varies from very low to moderate, and runoff potential varies from moderate to very high 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 example of an exception would be high runoff when short grasses 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

(060AY017SD) – Shallow Clayey	(060AY012SD) – Thin Upland
(060AY021SD) – Clayey Overflow	(060AY018SD) – Dense Clay
(060AY041SD) – Loamy 16-18" P.Z.	

Similar Sites

(060AY021SD) – Clayey Overflow	[more big bluestem; higher production]
(060AY041SD) – Loamy 16-18" P.Z.	[less green needlegrass; more needleandthread]
(060AY018SD) – Dense Clay	[less green needlegrass; more western wheatgrass; less short grasses]

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; 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	6	1971 – 1986	NE & SD	Dawes, Meade, 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

NE, State Range Management Specialist

Date

SD, State Range Management Specialist

Date