

United States Department of Agriculture Natural Resources Conservation Service

Ecological Site Description

Site Type: Rangeland

Site Name: Clayey Overflow

Site ID: R060AXY021SD

Major Land Resource Area (MLRA): 60A – Pierre Shale Plains



Physiographic Features

This site is nearly level to gently sloping and occurs on uplands and river valleys.

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

	<u>Minimum</u>	<u>Maximum</u>
Elevation (feet):	2,500	4,300
Slope (percent):	0	3
Water Table Depth (inches):	80	80
Flooding:		
Frequency:	Rare	Frequent
Duration:	Very brief	Brief
Ponding:		
Depth (inches):	None	None
Frequency:	None	None
Duration:	None	None
Runoff Class:	Low	Medium

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 13 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 46°F. January is the coldest month with average temperatures ranging from about 19°F (Moorcroft CAA, Wyoming (WY)), to about 22°F (Belle Fourche, South Dakota (SD)). July is the warmest month with temperatures averaging from about 70°F (Moorcroft CAA, WY), to about 72°F (Belle Fourche, SD). The range of normal average monthly temperatures between the coldest and warmest months is about 51°F. Hourly winds are estimated to average about 11 miles per hour (mph) annually, ranging from about 13 mph during the spring to about 10 mph 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 mph.

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. Greenup 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):	122	129
Freeze-free period (days):	145	152
Mean Annual Precipitation (inches):	13	18

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

	Precip. Min.	Precip. Max	Temp. Min.	Temp. Max.
January	0.32	0.43	7.1	34.1
February	0.44	0.57	12.6	40.1
March	0.65	0.94	19.7	46.5
April	1.43	1.72	29.4	60.2
May	2.45	3.19	39.7	70.6
June	2.34	3.38	48.5	80.1
July	1.60	2.78	54.8	88.0
August	1.24	1.76	53.1	87.7
September	1.01	1.50	42.3	77.0
October	0.90	1.11	31.4	64.9
November	0.40	0.61	19.8	47.5
December	0.40	0.48	10.2	38.0

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
WY6395	Moorcroft CAA	1948	1998
WY9207	Upton 13 SW	1949	1998

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

Influencing Water Features

Stream Type: B6, C6 (Rosgen System)

Representative Soil Features

The soils in this site are moderately well to well-drained and formed in alluvium. The silty clay loam to clay surface layer is 3 to 11 inches thick. The soils have a very slow to moderately slow infiltration rate. This site should show 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.

These soils are mainly susceptible to water erosion. The hazard of water erosion increases where vegetative cover is not adequate. A drastic loss of the soil surface layer on this site can result in a shift in species composition and/or production.

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
Parent Material Origin: mixed
Surface Texture: silty clay loam, clay, silty clay
Surface Texture Modifier: none
Subsurface Texture Group: clayey
Surface Fragments ≤3” (% Cover): 0
Surface Fragments >3” (%Cover): 0
Subsurface Fragments ≤3” (% Volume): 0-10
Subsurface Fragments >3” (% Volume): 0-5

	<u>Minimum</u>	<u>Maximum</u>
Drainage Class:	moderately well	well
Permeability Class:	very slow	moderately slow
Depth (inches):	80	80
Electrical Conductivity (mmhos/cm)*:	0	8
Sodium Absorption Ratio*:	0	5
Soil Reaction (1:1 Water)*:	6.6	8.4
Soil Reaction (0.1M CaCl2)*:	NA	NA
Available Water Capacity (inches)*:	5	8
Calcium Carbonate Equivalent (percent)*:	0	15

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

Plant Communities

Ecological Dynamics of the Site:

This site developed under Northern Great Plains climatic conditions, natural influences of large herbivores, occasional fire, and other biotic and abiotic factors that typically influence soil/site development. Changes will occur in the plant communities due to short-term weather variations, impacts of native and/or exotic plant and animal species, and management actions. While the following plant community descriptions describe more typical transitions between communities that will occur, severe disturbances, such as periods of well below average precipitation, can cause significant shifts in plant communities and/or species composition. As this site deteriorates, species such as blue grama and sagebrush will increase, and introduced species such as Kentucky bluegrass and Canada thistle will invade the site. Grasses such as slender wheatgrass, green needlegrass, big bluestem, rhizomatous wheatgrasses, prairie cordgrass, and switchgrass will decrease in frequency and production.

Clayey Overflow sites that are in association with Dense Clay and Thin Claypan sites, with slick spots, tend to create inclusions of a transitional plant community. The higher salt levels in the soils create a plant community that combines characteristics of both the Saline Lowland and Clayey Overflow sites. Species that are generally not common on a Saline Lowland site, but more closely associated with the Mixed Shrub/Western Wheatgrass Plant Community of the Clayey Overflow, occupy this transitional plant community. Saltgrass and western wheatgrass dominate, but species such as Canada wildrye, bluegrass, and sagebrush will also be present.

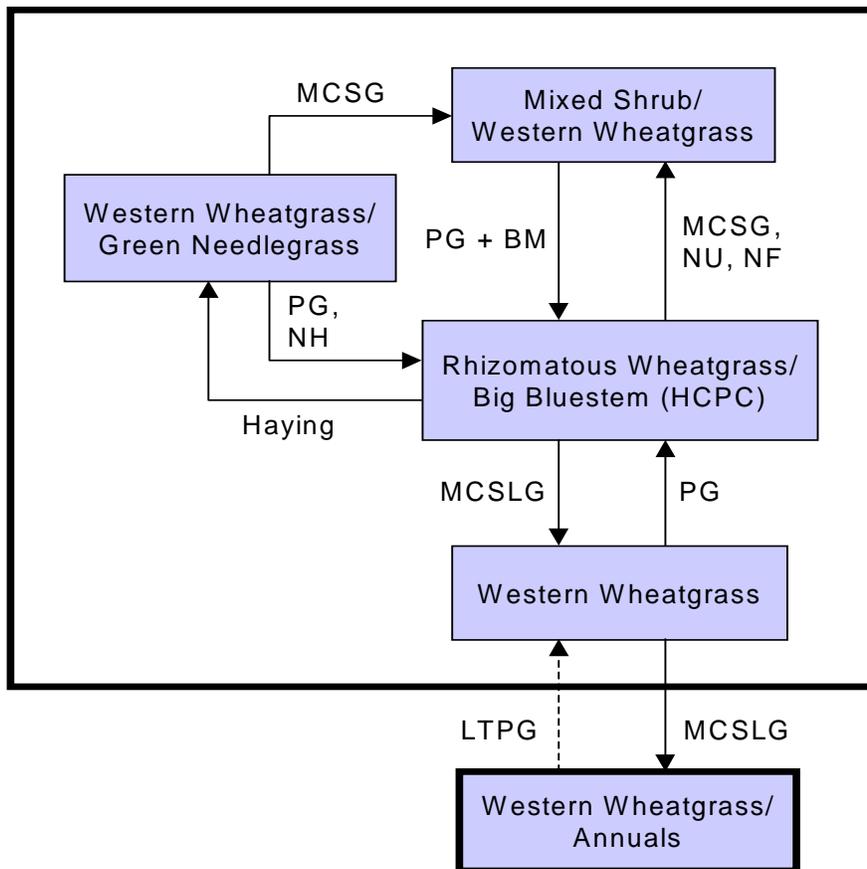
Due to the amount and pattern of the precipitation, the big sagebrush component typically is not resilient once it has been removed if a healthy and vigorous stand of grass exists and is maintained. The exception to this is where the herbaceous component is severely degraded at the time of brush

removal, growing conditions are unfavorable after treatment, and/or recovery periods are inadequate. Big sagebrush occurs mainly in the western portions of this MLRA, while silver sagebrush is found throughout the MLRA.

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



BM - Brush management (fire, chemical, mechanical); **HCPC** - Historic Climax Plant Community; **LTPG** - Long-term prescribed grazing; **MCSG** - Moderate, continuous seasonal grazing; **MCSLG** - Moderate, continuous season-long grazing; **NF** - No fire; **NH** - No haying; **NU** - Non-use; **PG** - Prescribed grazing (proper stocking rates with adequate recovery periods during the growing season).

Plant Community Composition and Group Annual Production

COMMON/GROUP NAME	SCIENTIFIC NAME	SYMBOL	Rhizomatous Wheatgrass/ Big Bluestem (HCPC)		
			Group	lbs./acre	% Comp
GRASSES & GRASS-LIKES				1875 - 2375	75 - 95
WHEATGRASS			1	750 - 1000	30 - 40
western wheatgrass	Pascopyrum smithii	PASM	1	750 - 1000	30 - 40
thickspike wheatgrass	Elymus lanceolatus ssp. lanceolatus	ELLAL	1	250 - 500	10 - 20
Montana wheatgrass	Elymus albicans	ELAL7	1	125 - 375	5 - 15
slender wheatgrass	Elymus trachycaulus ssp. trachycaulus	ELTRT	1	250 - 500	10 - 20
bearded wheatgrass	Elymus trachycaulus ssp. subsecundus	ELTRS	1	0 - 125	0 - 5
TALL WARM-SEASON GRASSES			2	250 - 750	10 - 30
big bluestem	Andropogon gerardii	ANGE	2	250 - 500	10 - 20
switchgrass	Panicum virgatum	PAVI2	2	125 - 375	5 - 15
NEEDLEGRASS			3	375 - 750	15 - 30
green needlegrass	Nassella viridula	NAV14	3	375 - 750	15 - 30
NATIVE GRASSES & GRASS-LIKES			4	125 - 250	5 - 10
mat muhly	Muhlenbergia richardsonis	MURI	4	0 - 50	0 - 2
blue grama	Bouteloua gracilis	BOGR2	4	25 - 125	1 - 5
buffalograss	Buchloe dactyloides	BUDA	4	25 - 125	1 - 5
bottlebrush squirreltail	Elymus elymoides	ELEL5	4	0 - 125	0 - 5
Canada wildrye	Elymus canadensis	ELCA4	4	125 - 250	5 - 10
sedge	Carex spp.	CAREX	4	125 - 250	5 - 10
prairie junegrass	Koeleria macrantha	KOMA	4	25 - 125	1 - 5
green muhly	Muhlenbergia racemosa	MURA	4	0 - 100	0 - 4
Sandberg bluegrass	Poa secunda	POSE	4	0 - 75	0 - 3
tall dropseed	Sporobolus compositus var. compositus	SPCOC2	4	25 - 125	1 - 5
spikerush	Eleocharis spp.	ELEOC	4	0 - 125	0 - 5
rush	Juncus spp.	JUNCU	4	0 - 125	0 - 5
inland saltgrass	Distichlis spicata	DISP	4	0 - 25	0 - 1
foxtail barley	Hordeum jubatum	HOJU	4	0 - 50	0 - 2
other perennial grasses		2GP	4	0 - 75	0 - 3
FORBS			6	125 - 250	5 - 10
American licorice	Glycyrrhiza lepidota	GLLE3	6	0 - 75	0 - 3
American vetch	Vicia americana	VIAM	6	0 - 75	0 - 3
cudweed sagewort	Artemisia ludoviciana	ARLU	6	0 - 75	0 - 3
false boneset	Brickellia eupatorioides	BREU	6	0 - 75	0 - 3
false Solomon's-seal	Maianthemum stellatum	MAST4	6	0 - 75	0 - 3
goldenrod	Solidago spp.	SOLID	6	0 - 75	0 - 3
hairy goldaster	Heterotheca villosa	HEV14	6	0 - 75	0 - 3
heath aster	Symphotrichum ericoides	SYER	6	0 - 75	0 - 3
Maximilian sunflower	Helianthus maximiliani	HEMA2	6	0 - 50	0 - 2
mint	Mentha spp.	MENTH	6	0 - 50	0 - 2
prairie coneflower	Ratibida columnifera	RACO3	6	0 - 75	0 - 3
purple prairie clover	Dalea purpurea	DAPU5	6	0 - 75	0 - 3
scarlet gaura	Gaura coccinea	GACO5	6	0 - 75	0 - 3
scurfpea	Psoraleum spp.	PSORA2	6	0 - 75	0 - 3
thistle	Cirsium spp.	CIRSI	6	0 - 25	0 - 1
western yarrow	Achillea millefolium	ACMI2	6	0 - 75	0 - 3
other annual forbs		2FA	6	0 - 75	0 - 3
other perennial forbs		2FP	6	0 - 75	0 - 3
SHRUBS			7	25 - 250	1 - 10
big sagebrush	Artemisia tridentata	ARTR2	7	0 - 125	0 - 5
chokecherry	Prunus virginiana	PRVI	7	0 - 125	0 - 5
fourwing saltbush	Atriplex canescens	ATCA2	7	0 - 75	0 - 3
fringed sagewort	Artemisia frigida	ARFR4	7	0 - 50	0 - 2
leadplant	Amorpha canescens	AMCA6	7	0 - 75	0 - 3
rose	Rosa spp.	ROSA6	7	25 - 125	1 - 5
silver sagebrush	Artemisia cana	ARCA13	7	0 - 125	0 - 5
western snowberry	Symphoricarpos occidentalis	SYOC	7	0 - 75	0 - 3
willow	Salix spp.	SALIX	7	0 - 50	0 - 2
other shrubs		2SHRUB	7	0 - 75	0 - 3
TREES			8	0 - 75	0 - 3
American elm	Ulmus americana	ULAM	8	0 - 75	0 - 3
boxelder	Acer negundo	ACNE2	8	0 - 50	0 - 2
green ash	Fraxinus pennsylvanica	FRPE	8	0 - 75	0 - 3
hackberry	Celtis occidentalis	CEOC	8	0 - 50	0 - 2
hawthorn	Crataegus spp.	CRATA	8	0 - 25	0 - 1
plains cottonwood	Populus deltoides ssp. monilifera	PODEM	8	0 - 75	0 - 3

Annual Production lbs./acre		LOW	RV	HIGH
GRASSES & GRASS-LIKES		1780 -	2138 -	2470
FORBS		120 -	188 -	275
SHRUBS		20 -	138 -	275
TREES		0 -	38 -	80
TOTAL		1900 -	2500 -	3100

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	Rhizomatous Wheatgrass/ Big Bluestem (HCPC)			Western Wheatgrass			Mixed Shrub/ Western Wheatgrass			Western Wheatgrass/ Annuals			
		Grp	lbs./acre	% Comp	Grp	lbs./acre	% Comp	Grp	lbs./acre	% Comp	Grp	lbs./acre	% Comp	
GRASSES & GRASS-LIKES			1875 - 2375	75 - 95		1200 - 1425	80 - 95		1575 - 1785	75 - 85		630 - 765	70 - 85	
WHEATGRASS		1	750 - 1000	30 - 40	1	525 - 675	35 - 45	1	735 - 1155	35 - 55	1	90 - 315	10 - 35	
western wheatgrass	PASM	1	750 - 1000	30 - 40	1	525 - 675	35 - 45	1	735 - 1155	35 - 55	1	90 - 315	10 - 35	
thickspike wheatgrass	ELLAL	1	250 - 500	10 - 20	1	15 - 75	1 - 5	1	21 - 105	1 - 5	1	9 - 45	1 - 5	
Montana wheatgrass	ELAL7	1	125 - 375	5 - 15	1	0 - 30	0 - 2	1	0 - 42	0 - 2				
slender wheatgrass	ELTRT	1	250 - 500	10 - 20	1	30 - 75	2 - 5	1	42 - 168	2 - 8	1	0 - 45	0 - 5	
bearded wheatgrass	ELTRS	1	0 - 125	0 - 5	1	0 - 30	0 - 2	1	21 - 147	1 - 7	1	0 - 18	0 - 2	
TALL WARM-SEASON GRASSES		2	250 - 750	10 - 30	2	30 - 150	2 - 10	2	21 - 105	1 - 5	2			
big bluestem	ANGE	2	250 - 500	10 - 20	2	0 - 75	0 - 5	2	0 - 210	0 - 10				
switchgrass	PAV2	2	125 - 375	5 - 15	2	30 - 75	2 - 5	2	21 - 63	1 - 3				
NEEDLEGRASS		3	375 - 750	15 - 30	3	150 - 300	10 - 20	3	42 - 105	2 - 5	3	0 - 45	0 - 5	
green needlegrass	NAVI4	3	375 - 750	15 - 30	3	150 - 300	10 - 20	3	42 - 105	2 - 5	3	0 - 45	0 - 5	
NATIVE GRASSES & GRASS-LIKES		4	125 - 250	5 - 10	4	75 - 150	5 - 10	4	105 - 210	5 - 10	4	45 - 180	5 - 20	
mat muhly	MURI	4	0 - 50	0 - 2	4	0 - 45	0 - 3	4	0 - 42	0 - 2	4	0 - 27	0 - 3	
blue grama	BOGR2	4	25 - 125	1 - 5	4	15 - 75	1 - 5	4	21 - 105	1 - 5	4	9 - 45	1 - 5	
buffalograss	BUDA	4	25 - 125	1 - 5	4	15 - 75	1 - 5	4	21 - 105	1 - 5	4	9 - 45	1 - 5	
bottlebrush squirreltail	ELEL5	4	0 - 125	0 - 5	4	0 - 75	0 - 5	4	0 - 105	0 - 5	4	0 - 45	0 - 5	
Canada wildrye	ELCA4	4	125 - 250	5 - 10	4	15 - 75	1 - 5	4	0 - 63	0 - 3				
sedge	CAREX	4	125 - 250	5 - 10	4	30 - 75	2 - 5	4	21 - 63	1 - 3	4	9 - 45	1 - 5	
prairie junegrass	KOMA	4	25 - 125	1 - 5	4	0 - 30	0 - 2	4	0 - 42	0 - 2	4	0 - 18	0 - 2	
green muhly	MURA	4	0 - 100	0 - 4	4	0 - 30	0 - 2	4	0 - 105	0 - 5				
Sandberg bluegrass	POSE	4	0 - 75	0 - 3	4	0 - 30	0 - 2	4	0 - 42	0 - 2	4	0 - 18	0 - 2	
tall dropseed	SPCOC2	4	25 - 125	1 - 5	4	15 - 75	1 - 5	4	21 - 105	1 - 5	4	9 - 45	1 - 5	
spikerush	ELEOC	4	0 - 125	0 - 5	4	0 - 45	0 - 3	4	0 - 63	0 - 3	4	0 - 27	0 - 3	
rush	JUNCU	4	0 - 125	0 - 5	4	0 - 45	0 - 3	4	0 - 63	0 - 3	4	0 - 27	0 - 3	
Inland saltgrass	DISP	4	0 - 25	0 - 1	4	15 - 75	1 - 5	4	21 - 63	1 - 3	4	9 - 90	1 - 10	
foxtail barley	HOJU	4	0 - 50	0 - 2	4	0 - 45	0 - 3	4	0 - 42	0 - 2	4	18 - 45	2 - 5	
other perennial grasses	2GP	4	0 - 75	0 - 3	4	0 - 45	0 - 3	4	0 - 63	0 - 3	4	0 - 45	0 - 5	
NON-NATIVE GRASSES		5			5	30 - 150	2 - 10	5	42 - 210	2 - 10	5	45 - 135	5 - 15	
Kentucky bluegrass	POPR				5	30 - 150	2 - 10	5	21 - 105	1 - 5	5	18 - 135	2 - 15	
cheatgrass	BRTE				5	15 - 75	1 - 5	5	21 - 105	1 - 5	5	18 - 90	2 - 10	
FORBS		6	125 - 250	5 - 10	6	75 - 150	5 - 10	6	105 - 315	5 - 15	6	90 - 180	10 - 20	
American licorice	GLLE3	6	0 - 75	0 - 3	6	0 - 45	0 - 3	6	0 - 63	0 - 3	6	0 - 18	0 - 2	
American vetch	VIAM	6	0 - 75	0 - 3				6	0 - 63	0 - 3				
cocklebur	XANTH2				6	0 - 30	0 - 2	6	0 - 21	0 - 1	6	18 - 90	2 - 10	
cudweed sagewort	ARLU	6	0 - 75	0 - 3	6	15 - 75	1 - 5	6	21 - 105	1 - 5	6	18 - 45	2 - 5	
curlycup gumweed	GRSQ				6	0 - 30	0 - 2	6	0 - 21	0 - 1	6	9 - 36	1 - 4	
false boneset	BREU	6	0 - 75	0 - 3				6	0 - 63	0 - 3				
false Solomon's-seal	MAST4	6	0 - 75	0 - 3	6	0 - 30	0 - 2	6	0 - 105	0 - 5				
goldenrod	SOLID	6	0 - 75	0 - 3	6	0 - 45	0 - 3	6	0 - 63	0 - 3	6	18 - 45	2 - 5	
hairy goldaster	HEV4	6	0 - 75	0 - 3	6	0 - 45	0 - 3	6	0 - 63	0 - 3	6	0 - 18	0 - 2	
heath aster	SYER	6	0 - 75	0 - 3	6	15 - 75	1 - 5	6	21 - 105	1 - 5	6	18 - 45	2 - 5	
Maximilian sunflower	HEMA2	6	0 - 50	0 - 2	6	0 - 15	0 - 1	6	0 - 63	0 - 3				
mint	MENTH	6	0 - 50	0 - 2	6	0 - 15	0 - 1	6	21 - 63	1 - 3				
prairie coneflower	RACO3	6	0 - 75	0 - 3	6	0 - 45	0 - 3	6	0 - 63	0 - 3	6	9 - 27	1 - 3	
purple prairie clover	DAPU5	6	0 - 75	0 - 3	6	0 - 30	0 - 2	6	0 - 63	0 - 3	6	0 - 9	0 - 1	
scarlet gaura	GACO5	6	0 - 75	0 - 3	6	0 - 45	0 - 3	6	0 - 63	0 - 3	6	0 - 18	0 - 2	
scurfpesa	PSORA2	6	0 - 75	0 - 3	6	15 - 45	1 - 3	6	21 - 63	1 - 3	6	18 - 45	2 - 5	
thistle	CIRSI	6	0 - 25	0 - 1	6	15 - 45	1 - 3	6	21 - 42	1 - 2	6	18 - 90	2 - 10	
western ragweed	AMPS				6	0 - 30	0 - 2	6	0 - 42	0 - 2	6	0 - 27	0 - 3	
western yarrow	ACMI2	6	0 - 75	0 - 3	6	0 - 45	0 - 3	6	0 - 63	0 - 3	6	18 - 45	2 - 5	
other annual forbs	2FA	6	0 - 75	0 - 3	6	15 - 45	1 - 3	6	21 - 63	1 - 3	6	18 - 45	2 - 5	
other perennial forbs	2FP	6	0 - 75	0 - 3	6	15 - 45	1 - 3	6	21 - 63	1 - 3	6	9 - 27	1 - 3	
SHRUBS		7	25 - 250	1 - 10	7	15 - 75	1 - 5	7	105 - 210	5 - 10	7	45 - 90	5 - 10	
big sagebrush	ARTR2	7	0 - 125	0 - 5	7	0 - 75	0 - 5	7	42 - 315	2 - 15	7	0 - 27	0 - 3	
chokecherry	PRV1	7	0 - 125	0 - 5	7	0 - 45	0 - 3	7	21 - 105	1 - 5	7	0 - 9	0 - 1	
fourwing saltbush	ATCA2	7	0 - 75	0 - 3	7	0 - 15	0 - 1	7	0 - 63	0 - 3				
fringed sagewort	ARFR4	7	0 - 50	0 - 2	7	0 - 45	0 - 3	7	0 - 63	0 - 3	7	0 - 18	0 - 2	
leadplant	AMCA6	7	0 - 75	0 - 3	7	0 - 15	0 - 1	7	0 - 63	0 - 3				
rose	ROSA5	7	25 - 125	1 - 5	7	15 - 45	1 - 3	7	21 - 105	1 - 5	7	9 - 27	1 - 3	
silver sagebrush	ARCA13	7	0 - 125	0 - 5	7	0 - 75	0 - 5	7	42 - 315	2 - 15	7	0 - 45	0 - 5	
western snowberry	SYOC	7	0 - 75	0 - 3	7	0 - 45	0 - 3	7	42 - 315	2 - 15	7	9 - 45	1 - 5	
willow	SALX	7	0 - 50	0 - 2	7	0 - 30	0 - 2	7	21 - 105	1 - 5	7	0 - 9	0 - 1	
other shrubs	2SHRUB	7	0 - 75	0 - 3	7	0 - 45	0 - 3	7	0 - 63	0 - 3	7	0 - 27	0 - 3	
TREES		8	0 - 75	0 - 3	8	0 - 45	0 - 3	8	0 - 63	0 - 3	8	0 - 9	0 - 1	
American elm	ULAM	8	0 - 75	0 - 3	8	0 - 30	0 - 2	8	0 - 63	0 - 3	8	0 - 9	0 - 1	
boxelder	ACNE2	8	0 - 50	0 - 2	8	0 - 30	0 - 2	8	0 - 42	0 - 2	8	0 - 9	0 - 1	
green ash	FRPE	8	0 - 75	0 - 3	8	0 - 45	0 - 3	8	0 - 63	0 - 3	8	0 - 9	0 - 1	
hackberry	CEOC	8	0 - 50	0 - 2	8	0 - 30	0 - 2	8	0 - 42	0 - 2	8	0 - 9	0 - 1	
hawthorn	CRATA	8	0 - 25	0 - 1	8	0 - 15	0 - 1	8	0 - 21	0 - 1	8	0 - 9	0 - 1	
plains cottonwood	PODEM	8	0 - 75	0 - 3	8	0 - 30	0 - 2	8	0 - 63	0 - 3	8	0 - 9	0 - 1	
other trees	2TREE				8	0 - 15	0 - 1	8	0 - 21	0 - 1	8	0 - 9	0 - 1	
Annual Production lbs./acre			LOW	RV	HIGH	LOW	RV	HIGH	LOW	RV	HIGH	LOW	RV	HIGH
GRASSES & GRASS-LIKES			1760 - 2138	-	2470	820 - 1320	-	1815	900 - 1701	-	2270	375 - 693	-	1110
FORBS			120 - 188	-	275	70 - 113	-	155	100 - 210	-	350	85 - 135	-	185
SHRUBS			20 - 138	-	275	10 - 45	-	80	100 - 158	-	215	40 - 68	-	95
TREES			0 - 38	-	80	0 - 23	-	50	0 - 32	-	65	0 - 5	-	10
TOTAL			1900 - 2500	-	3100	900 - 1500	-	2100	1100 - 2100	-	2900	500 - 900	-	1400

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” (DPCs). According to the USDA Natural Resources Conservation Service (NRCS) National Range and Pasture Handbook, DPCs will be determined by the decision makers and will meet minimum quality criteria established by the NRCS. The main purpose for including any description of a plant community here is to capture the current knowledge and experience at the time of this revision.

Rhizomatous Wheatgrass/Big Bluestem Plant Community

The plant community upon which interpretations are primarily based is the Rhizomatous Wheatgrass/Big Bluestem Plant Community. This is also considered the HCPC. Potential vegetation is about 75-95 percent grasses or grass-like plants, 5-10 percent forbs, 1-10 percent shrubs, and 0-3 percent trees. A mix of cool-season and warm-season grasses dominates the plant community. The major grasses and grass-likes include slender wheatgrass, rhizomatous wheatgrasses, big bluestem, green needlegrass, prairie cordgrass, switchgrass, sedges, and rushes. Other grasses in the plant community include bluebunch wheatgrass, mat muhly, Sandberg bluegrass, Canada wildrye, needleleaf sedge, blue grama, and prairie Junegrass. Shrubs such as silver sagebrush, leadplant, chokecherry, big sagebrush, rose, and snowberry are present. Forbs such as aster, American vetch, prairie coneflower, prairie clover, American licorice, cudweed sagewort, and goldenrod are common. Trees occurring on the site include scattered green ash, cottonwood, boxelder, and elm.

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). Community dynamics, nutrient cycle, water cycle, and energy flow are functioning properly. Plant litter is properly distributed with very little movement offsite and natural plant mortality is very low. The diversity in plant species allows for high drought tolerance. Runoff from adjacent sites and moderate or high available water capacity provides a favorable soil-water-plant relationship.

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

Growth curve number: SD6008

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

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

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

Transitional pathways leading to other plant communities are as follows.

- Haying will convert this plant community to the *Western Wheatgrass/Green Needlegrass Plant Community*.
- Moderate, continuous seasonal grazing or nonuse and no fire will convert this plant community to the *Mixed Shrub/Western Wheatgrass Plant Community*.

Western Wheatgrass/Green Needlegrass Plant Community

This plant community is the result of haying. Western wheatgrass and green needlegrass dominate. These grasses form a sod which is very productive and is often used for dryland hay. This plant community is productive but lacks the diversity of the HCPC. The soil of this plant community is protected. The watershed is functioning but may produce slightly 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: SD6006

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

Growth curve description: Cool-season dominant, lowland.

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

Transitional pathways leading to other plant communities are as follows.

- Prescribed grazing will eventually return this plant community to the *Rhizomatous Wheatgrass/Big Bluestem Plant Community*.
- Moderate, continuous seasonal grazing will convert this plant community to the *Mixed Shrub/Western Wheatgrass Plant Community*.

Western Wheatgrass Plant Community

This plant community results from continuous season-long grazing without adequate recovery periods between each grazing event during the growing season. Recognition of this plant community will enable the land user to implement key management decisions before a significant ecological threshold is crossed. Western wheatgrass is the dominant species. Big bluestem, green needlegrass, and switchgrass are greatly reduced. Forb species include western yarrow, asters, prairie coneflower, and western ragweed. Leadplant is greatly reduced while other shrub species would tend to be heavily browsed. This plant community is relatively stable and less productive than the HCPC. Reduction of litter and short plant heights result in higher soil temperatures, poor water infiltration rates, and increased runoff. This plant community can occur throughout the site, on spot grazed areas, and around water sources where season-long grazing patterns occur. Soil erosion will be minimal due to the sod forming habit of Kentucky bluegrass.

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

Growth curve number: SD6007

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

Growth curve description: Cool-season dominant, warm-season subdominant, lowland.

JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
0	0	5	13	20	25	18	11	5	3	0	0

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

- Moderate, continuous season-long grazing will move this plant community across the ecological threshold to the *Western Wheatgrass/Annuals Plant Community*.
- Prescribed grazing will shift this plant community back to the *Rhizomatous Wheatgrass/Big Bluestem Plant Community (HCPC)*.

Mixed Shrub/Western Wheatgrass Plant Community

This plant community develops after an extended period of nonuse and exclusion of fire. This plant community will also develop with moderate or heavy continuous seasonal grazing. In either case, shrubs increase and can sometimes dominate the plant community.

Cool-season grasses make up the majority of the understory with the balance made up of short warm-season grasses, annual cool-season grasses, and miscellaneous forbs. Western wheatgrass is the dominant grass. Grasses of secondary importance include blue grama, prairie Junegrass, Sandberg bluegrass, green needlegrass, and slender wheatgrass. Woody plants such as big sagebrush, silver sagebrush, and snowberry have increased with canopy cover up to 20 percent. Forbs commonly found in this plant community include cudweed sagewort, goldenrod, hairy gold aster, and scurfpea. When compared to the HCPC, western wheatgrass has increased, while green needlegrass and big bluestem have decreased. Production of cool-season grasses has also been reduced. This plant community is stable and protected from excessive erosion. The biotic integrity is usually intact, but it can be at risk if dominated by short grasses or shrubs, and if invaded by introduced species.

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

Growth curve number: SD6008

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

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

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

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

- Brush control followed by prescribed grazing, will result in a plant community very similar to the *Rhizomatous Wheatgrass/Big Bluestem Plant Community*.

Western Wheatgrass/Annuals Plant Community

This plant community developed with heavy continuous season-long grazing. Western wheatgrass and Kentucky bluegrass dominate the community. Green needlegrass has been greatly reduced. Big bluestem has been removed. Western yarrow, scurfpea, ragweed, and goldenrod have increased. Nonnative grasses and forbs such as annual bromes, curlycup gumweed, thistle, and cocklebur will invade this plant community.

This plant community is resistant to change to a higher successional plant community due to low plant diversity and competition of the invaded species. A significant amount of production and diversity has been lost when compared to the HCPC. The loss of desirable species has negatively impacted energy flow and nutrient cycling. Water infiltration is reduced significantly. Soil loss may be accelerated where concentrated flows occur. It will take a very long time to restore this plant community back to the HCPC with improved management. Renovation would be very costly.

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

Growth curve number: SD6006

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

Growth curve description: Cool-season dominant, lowland.

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

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

- Long-term prescribed grazing may move this plant community toward the *Western Wheatgrass Plant Community*. It may eventually return to the *HCPC* or associated successional plant community stages assuming an adequate seed/vegetative source is available.

Ecological Site Interpretations

Animal Community – Wildlife Interpretations

The MLRA 60A lies within the drier portion of the northern mixed-grass prairie ecosystem where sagebrush steppes to the west yield to grassland steppes to the east. Prior to European settlement, this area consisted of diverse grass/shrub land habitats interspersed with varying densities of depressional, in-stream wetlands, and woody riparian corridors. These habitats provided critical life cycle components for many of its users. Many species of grassland birds, small mammals, reptiles, amphibians, and herds of roaming bison, elk, and pronghorn were among the inhabitants adapted to this semi-arid region. Roaming herbivores, as well as, several small mammal and insect species, were the primary consumers linking the grassland resources to predators such as the wolf, mountain lion, and grizzly bear, as well as, smaller carnivores such as the coyote, bobcat, fox, and raptors. The prairie dog was once abundant; however, the species remains a keystone species within its range. The black-footed ferret, burrowing owl, ferruginous hawk, mountain plover, and swift fox were associated with prairie dog complexes.

Historically, the northern mixed-grass prairie was a disturbance-driven ecosystem with fire, herbivory, and climate functioning as the primary disturbance factors either singly or in combination. Following European settlement, livestock grazing, cropland conversion, elimination of fire, energy development, and other anthropogenic factors influenced species composition and abundance. Introduced and invasive species further impacted plant and animal communities. Bison was a historical keystone species but have been extirpated as a free-ranging herbivore. The loss of the bison and prairie dog, and fire as ecological drivers greatly influenced the character of the remaining native plant communities and altered wildlife habitats. Human development has reduced habitat quality for area-sensitive species.

Within MLRA 60A, the Clayey Overflow Ecological Site provides upland grassland cover with an associated forb, shrub, and tree component. It was typically part of an expansive grassland landscape that included combinations of Shallow Loamy, Shallow Clayey, Thin Loamy, Thin Claypan, Sandy, Sandy Claypan, Loamy, Sandy Terrace and Clayey Ecological Sites.

Although this ecological site is primarily dominated by western wheatgrass, this site can support a plant community composed of various age classes of elm, green ash, and boxelder; with a shrub component of chokecherry, western snowberry, silver buffaloberry, etc. The presence or absence of this tree/shrub component is an important factor influencing wildlife species composition. This site is subject to invasion of grass species such as annual bromegrasses and Kentucky bluegrass. Woody species such as Russian-olive and Tamarisk (saltcedar), may invade this site.

This site provides habitat for grassland and shrub thicket nesting birds, small rodents, bats, mammalian predators, and a variety of reptiles, amphibians, and insects. Within the MLRA this site provides the suitable habitat for numerous riparian associated species. This site provides foraging and brood rearing habitat for upland game birds such as greater sage-grouse and sharp-tailed grouse. However, due to the presence of invasive grass and/or woody species, ground nesting birds' reproduction is reduced.

Rhizomatous Wheatgrass/Big Bluestem (HCPC): This site is dominated by western wheatgrass and big bluestem with a shrub community generally dominated by sagebrush, chokecherry, and rose species that favors grazers and mixed-feeders, such as deer. Plant communities associated with shrub thickets and low shrubs provide habitat for songbirds such as brown thrasher, yellow warbler, gray catbird, Say's phoebe, loggerhead shrike, Lazuli bunting, and yellow breasted chat. Raptors such as red-tailed hawk, Swainson's hawk, American kestrel, and great-horned owl may use this site. Insects, such as pollinators, play a limited role in maintaining the forb community but provide a significant forage base for birds and other species. Diverse prey populations are available for grassland raptors and mammalian predators, especially bobcat.

Although this site provides a lower diversity of grasses, forbs, and shrubs, the site does provide limited nutrition levels for small and large herbivores including voles, mice, thirteen-lined ground squirrel, Eastern cottontail rabbit, white-tailed jackrabbit, and deer. This site provides nesting and brood rearing habitat for greater sage-grouse and sharp-tailed grouse. This ecological site provides excellent fawning habitat for white-tailed deer. The relatively tall stature of this plant community provides suitable thermal, protective, and escape cover for small and large mammals. This plant community provides limited habitat for amphibians, mostly toads. Numerous reptile species such as lizards, bull, and garter snakes may occupy the site.

Mixed Shrub/Western Wheatgrass: Resulting from moderate, continuous seasonal grazing, nonuse, or reduction in fire frequency, shrubs and western wheatgrass will dominate. Shrub diversity and density has increased. The minor tree component remains largely unchanged. Livestock damage to trees is often noticeable. The increase in the shrub component results in increased habitat for yellow warbler, gray catbird, loggerhead shrike, Bell's vireo, brown thrasher, Lazuli bunting, and yellow breasted chat. This site provides brood rearing habitat for greater sage-grouse and sharp-tailed grouse. When present, the tree component continues to provide habitat for red-tailed hawk, American kestrel, and Say's phoebe. This plant community provides limited habitat for amphibians, mostly toads. Numerous reptile species such as lizards, bull, and garter snakes may occupy the site.

Western Wheatgrass/Green Needlegrass: Resulting from haying the plant community will become dominated by western wheatgrass and green needlegrass. The forb and shrub diversity will be reduced. The shift from to western wheatgrass and green needlegrass will result in a significant change to the wildlife community. Almost all shrub or low shrub dependent birds will not use this site due to haying of the shrubs, especially western snowberry and rose species. Small mammals such as voles and mice will continue to use the site. Predators utilizing this plant community include the coyote, red fox, long-tailed weasel, raccoon, and bobcat. Grassland nesting bird use of the site may decline due to haying activities.

Western Wheatgrass: Resulting from moderate, continuous season-long grazing, western wheatgrass will dominate this site. Tree and shrub diversity and abundance have either been greatly decreased or eliminated. The reduction of the tree and shrub component results in either an elimination or significant reduction of tree and shrub utilizing birds such as brown thrasher, yellow warbler, gray catbird, loggerhead shrike, Lazuli bunting, and yellow breasted chat. Grassland nesting bird species will increase. Small mammals such as voles and mice will continue to use the site. Predators utilizing this plant community include the coyote, red fox, and long-tailed weasel.

Western Wheatgrass/Annuals: This plant community develops under moderate, continuous season-long grazing of western wheatgrass. The dominant vegetation includes Kentucky bluegrass, inland saltgrass, and annual grasses, forbs, invaders, and early successional biennial and perennial species. Plant species from adjacent ecological sites may become minor components of this plant

community. The community is susceptible to invasion of annual bromegrasses and other nonnative species due to severe soil disturbances and relatively high percent of bare ground.

Soil erosion is potentially high, impacting offsite aquatic habitats through increased runoff, nutrient, and sediment loads. Reduced surface cover, low plant density, low plant vigor, loss of root biomass, and soil compaction, all contribute to decreased wildlife abundance and diversity. Since secondary succession is highly variable plant and wildlife species will vary. This plant community provides habitat for generalist or early successional species.

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

Common Name	Cattle	Sheep	Horses	Deer	Antelope	Bison	Elk
Grasses & Grass-like							
bearded wheatgrass	U P U U	N D U N	U P U U	N D U N	N D U N	U P U U	U P U U
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
bottlebrush squirreltail	U D U U	N D U N	U D U U	N D U N	N D U N	U D U U	U D U U
buffalograss	U U P D	U U P D	U U D U	N U D U	N U D U	U D U U	U D U U
Canada wildrye	U D U U	N U N N	U D U U	N U N N	N U N N	U D U U	U D U U
foxtail barley	U D N N	N P N N	U D N N	N P N N	N P N N	U D N N	U D N N
green muhly	U D D U	N U N N	U D D U	N U N N	N U N N	U D D U	U D D U
green needlegrass	U P U D	N P N P	U P U D	N P N P	N P N P	U P U D	U P U D
inland saltgrass	N U U N	N N N N	N U U N	N N N N	N N N N	N U U N	N U U N
mat muhly	N U U N	U U D U	N U U N	U U U U	U U U U	N U U N	N U U N
Montana wheatgrass	U P D U	N D N N	U P D U	N D N N	N D N N	U P D U	U P D U
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
rush	N N N N	N N N N	N N N N	N N N N	N N N N	N N N N	N N N N
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
slender wheatgrass	U P U U	U D U U	U P U U	N D U N	N D U N	U P U U	U P U U
spikerush	U U U U	U U U U	U U U U	U U U U	U U U U	U U U U	U U U U
switchgrass	U D D U	U D U U	U D D U	N N N N	N N N N	U D D U	U D D U
tall dropseed	N U N N	N U N N	N U N N	N U N N	N U N N	N U N N	N U N N
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
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 licorice	U U D U	N U U N	U U D U	N U U N	N U U N	U U D U	N U U N
American vetch	U D P U	U P P U	U D P U	U P P U	U P P U	U D P U	U P P U
cudweed sagewort	U U U U	U U D U	U U U U	U U D U	U U D U	U U U U	U U D U
false boneset	U U D U	N D U N	U U D U	N D U N	N D U N	U U D U	N D U N
false Solomon's-seal	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
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
hairy goldaster	U U D U	N N N N	U U D U	N N N N	N N N N	U U D U	N N N N
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
Maximilian sunflower	U D P U	U D P U	U D P U	U D P U	U D P U	U D P U	U D P U
mint	N N U N	N U U N	N N U N	N U U N	N U U N	N N U N	N U U N
prairie coneflower	U U D U	U P P U	U U D U	U P P U	U P P U	U U D U	U P P U
purple prairie clover	U D P U	U P P U	U D P U	U P P U	U P P U	U D P U	U P P U
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
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
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 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							
big sagebrush	U U U U	D U U D	U N U U	P U D P	P P P P	U N U U	D U U U
chokecherry	D T T D	D T T D	D T T D	P U D P	D U U D	D T T D	P U U P
fourwing saltbush	P D D P	P D D P	P D D P	P D D P	P D D P	P D D P	P D D P
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
silver sagebrush	D U U D	D U U D	D U U D	P D D P	P P P P	D U U D	D U U D
western snowberry	U U U U	U U U U	U U U U	D U D D	U U U U	U U U U	D U U U
willow	P U D P	P U D P	P U D P	P U D P	U U U U	P U D P	P U D P
Trees							
American elm	N N N N	N N N N	N N N N	N U D N	N N N N	N N N N	N N N N
boxelder	N N U U	N N U U	N N U U	N N U U	N N U U	N N U U	N N U U
green ash	N U D U	N D D U	N U D U	N D D U	N U D U	N U D U	N D D U
hackberry	N U D U	N D D U	N U D U	N D D U	N U D U	N U D U	N D D U
hawthorn	N U U U	N D D U	N U U U	N D D U	N U U U	N U U U	N D D U
plains cottonwood	D U U D	D U U D	D U U D	D U D D	D U U D	D U U D	D U U D

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

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

Animal Community – Grazing Interpretations

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

Plant Community	Average Annual Production (lbs./acre, air-dry)	Stocking Rate* (AUM/acre)
Rhizomatous Wheatgrass/Big Bluestem	2,500	0.75 – 0.85
Western Wheatgrass/Green Needlegrass	2,200	0.65 – 0.75
Western Wheatgrass	1,500	0.45 – 0.50
Mixed Shrub/Western Wheatgrass	2,100	0.55 – 0.60
Western Wheatgrass/Annuals	900	0.25 – 0.35**

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

**Highly variable; stocking rate needs to be determined onsite.

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 herbage production on this site. The site is dominated by soils in hydrologic groups C and D. Infiltration ranges from very slow to moderately slow, and runoff potential for this site varies from low to medium depending on soil hydrologic group, slope, and ground cover. In many cases, areas with greater than 75 percent ground cover have the greatest potential for high infiltration and lower runoff. An exception would be where short grasses form a dense sod. Normally, areas where ground cover is less than 50 percent have the greatest potential to have reduced infiltration and higher runoff (refer to Section 4, NRCS National Engineering Handbook, for runoff quantities and hydrologic curves).

Recreational Uses

This site provides hunting opportunities for upland game species. The wide varieties 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

(060AY011SD) – Clayey 13-16" P.Z.	(060AY022SD) – Loamy Terrace
(060AY040SD) – Clayey 16-18" P.Z.	(060AY018SD) – Dense Clay
(060AY025SD) – Shallow Dense Clay	(060AY042SD) – Lowland

Similar Sites

(060AY020SD) – Loamy Overflow
[More bluestems; less western wheatgrass]

Inventory Data References

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

<u>Data Source</u>	<u>Number of Records</u>	<u>Sample Period</u>	<u>State</u>	<u>County</u>
SCS-RANGE-417				
Ocular estimate				

State Correlation

This site has been correlated between Montana (MT), Nebraska (NE), SD, and WY in MLRA 60A.

Field Offices

Belle Fourche, SD	Custer, SD	Hot Springs, SD	Pine Ridge, SD	Sundance, WY
Broadus, MT	Ekalaka, MT	Lusk, WY	Rapid City, SD	Wall, SD
Buffalo, SD	Faith, SD	Martin, SD	Rushville, NE	
Chadron, NE	Gillette, WY	Newcastle, WY	Sturgis, SD	

Relationship to Other Established Classifications

Level IV Ecoregions of the Conterminous United States: 43e – Sagebrush Steppe, 43g – Semi-arid 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://www.hprcc.unl.edu/>)

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

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

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

USDA, NRCS, 2002. National Soil Survey Handbook, Title 430-VI.
(<http://soils.usda.gov/technical/handbook/>)

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

MT, State Range Management Specialist Date

NE, State Range Management Specialist Date

SD, State Range Management Specialist Date

WY, State Range Management Specialist Date