United States Department of Agriculture
Natural Resources Conservation Service

Ecological Site Description

Site Type: Rangeland

Site Name: Saline Lowland

Site ID: R063AY007SD

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

Physiographic Features

This site occurs on gently undulating floodplains.

Landform: floodplain

Aspect: N/A

	Minimum	Maximum
Elevation (feet):	1600	2700
Slope (percent):	0	2
Water Table Depth (inches):	0	18
Flooding:		
Frequency:	Occasional	Occasional
Duration:	Brief	Brief
Ponding:		
Depth (inches):	None	None
Frequency:	None	None
Duration:	None	None
Runoff Class:	Medium	High

Climatic Features

MLRA 63A is considered to have a continental climate – cold winters and hot summers, low humidity, light rainfall, and much sunshine. Extremes in temperature may also abound. The climate is the result of this MLRA's location near the geographic center of North America. There are few natural barriers on the Northern Great Plains and air masses move freely across the plains and account for rapid changes in temperature.

Annual precipitation ranges from 16 to 20 inches per year. The average annual temperature is about 47°F. January is the coldest month with average temperatures ranging from about 11°F (Pollock, South Dakota (SD)) to about 22°F (Cedar Butte, SD). July is the warmest month with temperatures averaging from about 72°F (Pollock, SD), to about 76°F (Cedar Butte, SD). The range of normal average monthly temperatures between the coldest and warmest months is about 58°F. This large annual range attests to the continental nature of this area's climate. Hourly winds are estimated to average about 11 miles per hour annually, ranging from about 13 miles per hour during the spring to about 10 miles per hour during the summer. Daytime winds are generally stronger than nighttime and

occasional strong storms may bring brief periods of high winds with gusts to more than 50 miles per hour.

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

	Minimum	Maximum
Frost-free period (days):	126	149
Freeze-free period (days):	149	165
Mean Annual Precipitation (inches):	16	20

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

	Precip. Min.	Precip. Max	Temp. Min.	Temp. Max.
January	0.40	0.41	-0.9	34.0
February	0.44	0.49	5.8	39.2
March	0.87	1.36	17.3	49.0
April	1.77	2.18	31.3	61.2
May	2.82	3.29	43.3	72.2
June	2.96	3.45	53.2	82.5
July	2.04	2.84	58.5	90.8
August	1.57	2.38	56.5	90.3
September	1.13	1.53	45.4	79.2
October	1.02	1.38	33.4	65.7
November	0.48	0.63	19.3	48.2
December	0.23	0.35	5.7	37.2

Climate Stations		Period	
Station ID	**Location or Name**	**From**	**To**
SD1539	Cedar Butte	1951	2004
SD1972	Cottonwood 3 E	1909	2004
SD6712	Pollock	1948	2004
SD6790	Presho 7 NW	1975	2004

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

Riparian and Wetland Features

Wetland Description:	System	Subsystem	Class	Subclass
Cowardin, et al., 1979	Palustrine	N/A	Emergent Wetland	Persistent

Representative Soil Features

The common features of soils in this site are clay-textured subsoil and slopes of zero to two percent. The soils in this site are very poorly drained and formed in alluvium. The silty clay loam surface layer is 4 to 18 inches thick. The soils have a slow infiltration rate. This site should show no evidence of rills, wind scoured areas, or pedestalled plants. The soil surface is stable and intact. Subsurface soil layers are nonrestrictive to water movement and root penetration.

These soils are not susceptible to water erosion. Slow permeability strongly influences the soil-water-plant relationship.

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

Parent Material Kind: alluvium
Parent Material Origin: shale, unspecified
Surface Texture: silty clay loam
Surface Texture Modifier: none
Subsurface Texture Group: clayey
Surface Fragments ≤3" (% Cover): 0
Surface Fragments >3" (%Cover): 0
Subsurface Fragments ≤3" (% Volume): 0
Subsurface Fragments >3" (% Volume): 0

	Minimum	Maximum
Drainage Class:	poor	poor
Permeability Class:	slow	slow
Depth to Bedrock (inches):	80	80
Electrical Conductivity (mmhos/cm)*:	8	16
Sodium Absorption Ratio*:	0	4
Soil Reaction (1:1 Water)*:	7.4	9.0
Soil Reaction (0.1M CaCl2)*:	NA	NA
Available Water Capacity (inches)*:	4	4
Calcium Carbonate Equivalent (percent)*:	1	15

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

Plant Communities

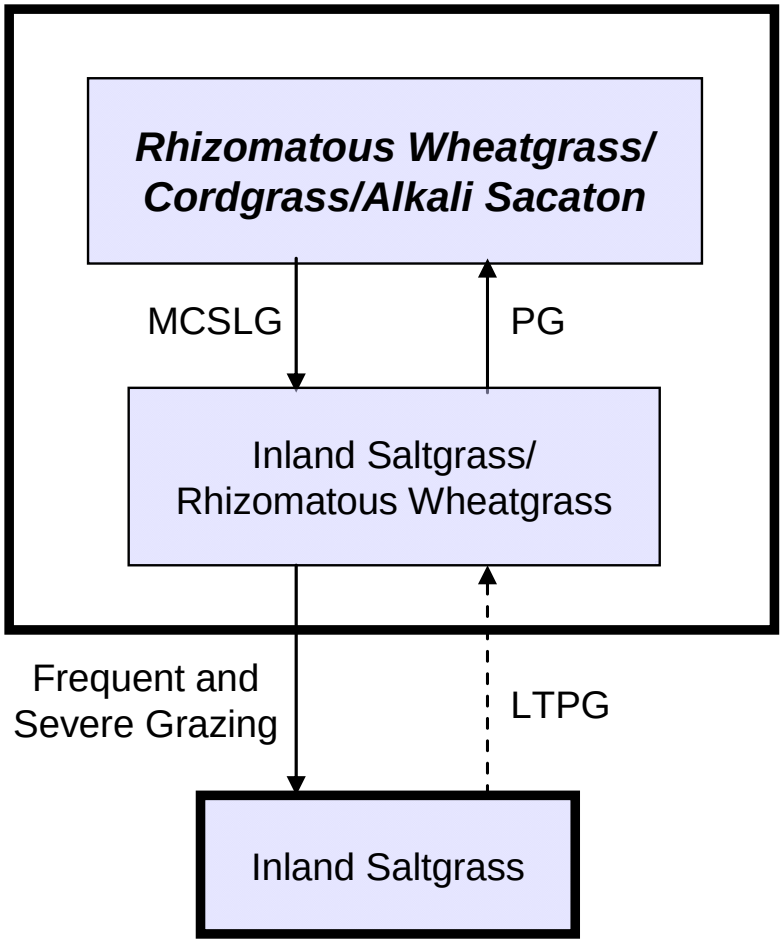
Ecological Dynamics of the Site:
This site developed under Northern Great Plains climatic conditions, natural influences of large herbivores, occasional fire, and other biotic and abiotic factors that typically influence soil/site development. Changes will occur in the plant communities due to short-term 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. Shrubs such as greasewood and rubber rabbitbrush will occur in higher amounts on the western portions of where this site occurs.

As this site deteriorates, species such as inland saltgrass and foxtail barley (and greasewood in the western portions of the MLRA) increase, and annual species may invade the site. Grasses such as alkali sacaton, rhizomatous wheatgrasses, and Nuttall's alkaligrass will decrease in frequency and production. The high salt content of the soils greatly influences the plant species present. Plant vigor can vary on a year-to-year basis in relation to current precipitation amounts, which influences the translocation of salts in the soil profile. Typically only salt tolerant plants are found on this site.

The plant community upon which interpretations are primarily based is the Rhizomatous Wheatgrass/Cordgrass/Alkali Sacaton Plant Community. This plant community 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 diagram illustrates the common plant communities and vegetation states commonly occurring on the site and the transition pathways between communities and states. The ecological processes will be discussed in more detail in the plant community descriptions following the diagram.

Plant Communities and Transitional Pathways



Frequent and Severe Grazing – Frequent and severe utilization of the cool-season mid grasses during the growing season; **LTPG** – Long-term prescribed grazing; **MCSLG** – Moderate, continuous season-long grazing; **PG** – Prescribed grazing (proper stocking rates with adequate recovery periods during the growing season).

Plant Community Composition and Group Annual Production

			Rhizomatous Wheatgrass/ Cordgrass/Alkali Sacaton		
COMMON/GROUP NAME	**SCIENTIFIC NAME**	**SYMBOL**	**Group**	**lbs./acre**	**% Comp**
GRASSES & GRASS-LIKES				*2380 - 2660*	*85 - 95*
RHIZOMATOUS WHEATGRASS			**1**	**560 - 980**	**20 - 35**
western wheatgrass	Pascopyrum smithii	PASM	1	280 - 980	10 - 35
thickspike wheatgrass	Elymus lanceolatus ssp. lanceolatus	ELLAL	1	140 - 560	5 - 20
CORDGRASS			**2**	**280 - 700**	**10 - 25**
prairie cordgrass	Spartina pectinata	SPPE	2	140 - 700	5 - 25
alkali cordgrass	Spartina gracilis	SPGR	2	140 - 560	5 - 20
SACATON			**3**	**140 - 420**	**5 - 15**
alkali sacaton	Sporobolus airoides	SPAI	3	140 - 420	5 - 15
COOL-SEASON GRASSES			**4**	**280 - 560**	**10 - 20**
Nuttall's alkaligrass	Puccinellia nuttalliana	PUNU2	4	140 - 420	5 - 15
foxtail barley	Hordeum jubatum	HOJU	4	28 - 140	1 - 5
slender wheatgrass	Elymus trachycaulus	ELTR7	4	0 - 140	0 - 5
bottlebrush squirreltail	Elymus elymoides	ELEL5	4	0 - 84	0 - 3
plains bluegrass	Poa arida	POAR3	4	0 - 84	0 - 3
other perennial grasses		2GP	4	0 - 140	0 - 5
SHORT WARM-SEASON GRASSES			**5**	**56 - 280**	**2 - 10**
inland saltgrass	Distichlis spicata	DISP	5	56 - 280	2 - 10
alkali muhly	Muhlenbergia asperifolia	MUAS	5	0 - 84	0 - 3
GRASS-LIKES			**6**	**0 - 224**	**0 - 8**
bulrush	Schoenoplectus spp.	SCHOE6	6	0 - 140	0 - 5
rush	Juncus spp.	JUNCU	6	0 - 140	0 - 5
sedge	Carex spp.	CAREX	6	0 - 140	0 - 5
spikerush	Eleocharis spp.	ELEOC	6	0 - 84	0 - 3
FORBS			*8*	*140 - 280*	*5 - 10*
alkali plantain	Plantago eriopoda	PLER	8	28 - 56	1 - 2
American licorice	Glycyrrhiza lepidota	GLLE3	8	0 - 56	0 - 2
annual marshelder	Iva annua	IVAN2	8	0 - 56	0 - 2
aster	Aster spp.	ASTER	8	28 - 56	1 - 2
curlycup gumweed	Grindelia squarrosa	GRSQ	8	0 - 28	0 - 1
giant sumpweed	Iva xanthifolia	IVXA	8	0 - 84	0 - 3
mealy goosefoot	Chenopodium incanum	CHIN2	8	28 - 56	1 - 2
povertyweed	Iva axillaris	IVAX	8	28 - 56	1 - 2
Pursh seepweed	Suaeda calceoliformis	SUCA2	8	0 - 84	0 - 3
red saltwort	Salicornia rubra	SARU	8	28 - 56	1 - 2
seepweed	Suaeda spp.	SUAED	8	0 - 84	0 - 3
silverleaf cinquefoil	Potentilla argentea	POAR8	8	0 - 28	0 - 1
western dock	Rumex aquaticus	RUAQ	8	0 - 56	0 - 2
native forbs		2FN	8	0 - 140	0 - 5
SHRUBS			*9*	*28 - 140*	*1 - 5*
black greasewood	Sarcobatus vermiculatus	SAVE4	9	0 - 84	0 - 3
fourwing saltbush	Atriplex canescens	ATCA2	9	0 - 84	0 - 3
Gardner's saltbush	Atriplex gardneri	ATGA	9	0 - 56	0 - 2
rubber rabbitbrush	Ericameria nauseosa	ERNA10	9	0 - 84	0 - 3
other shrubs		2SHRUB	9	0 - 56	0 - 2
TREES			*10*	*0 - 56*	*0 - 2*
plains cottonwood	Populus deltoides ssp. monilifera	PODEM	10	0 - 56	0 - 2

Annual Production lbs./acre	LOW	RV	HIGH
GRASSES & GRASS-LIKES	1750 -	2478	- 2965
FORBS	125 -	210	- 320
SHRUBS	25 -	84	- 155
TREES	0 -	28	- 60
TOTAL	1900 -	2800	- 3500

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

		Rhizomatous Wheatgrass/ Cordgrass/Alkali Sacaton			Inland Saltgrass/ Rhizomatous Wheatgrass			Inland Saltgrass		
COMMON/GROUP NAME	**SYMBOL**	**Grp**	**lbs./acre**	**% Comp**	**Grp**	**lbs./acre**	**% Comp**	**Grp**	**lbs./acre**	**% Comp**
GRASSES & GRASS-LIKES			*2380 - 2660*	*85 - 95*		*1600 - 1900*	*80 - 95*		*1200 - 1425*	*80 - 95*
RHIZOMATOUS WHEATGRASS		**1**	**560 - 980**	**20 - 35**	**1**	**100 - 400**	**5 - 20**	**1**	**0 - 150**	**0 - 10**
western wheatgrass	PASM	1	280 - 980	10 - 35	1	100 - 400	5 - 20	1	0 - 150	0 - 10
thickspike wheatgrass	ELLAL	1	140 - 560	5 - 20	1	0 - 200	0 - 10	1	0 - 75	0 - 5
CORDGRASS		**2**	**280 - 700**	**10 - 25**	**2**	**0 - 200**	**0 - 10**	**2**		
prairie cordgrass	SPPE	2	140 - 700	5 - 25	2	0 - 200	0 - 10			
alkali cordgrass	SPGR	2	140 - 560	5 - 20	2	0 - 100	0 - 5			
SACATON		**3**	**140 - 420**	**5 - 15**	**3**	**0 - 100**	**0 - 5**	**3**		
alkali sacaton	SPAI	3	140 - 420	5 - 15	3	0 - 100	0 - 5			
COOL-SEASON GRASSES		**4**	**280 - 560**	**10 - 20**	**4**	**300 - 500**	**15 - 25**	**4**	**150 - 450**	**10 - 30**
Nuttall's alkaligrass	PUNU2	4	140 - 420	5 - 15	4	200 - 400	10 - 20	4	75 - 225	5 - 15
foxtail barley	HOJU	4	28 - 140	1 - 5	4	40 - 200	2 - 10	4	75 - 300	5 - 20
slender wheatgrass	ELTR7	4	0 - 140	0 - 5						
bottlebrush squirreltail	ELEL5	4	0 - 84	0 - 3	4	0 - 40	0 - 2			
plains bluegrass	POAR3	4	0 - 84	0 - 3	4	0 - 20	0 - 1			
other perennial grasses	2GP	4	0 - 140	0 - 5	4	0 - 100	0 - 5	4	0 - 75	0 - 5
SHORT WARM-SEASON GRASSES		**5**	**56 - 280**	**2 - 10**	**5**	**300 - 600**	**15 - 30**	**5**	**450 - 825**	**30 - 55**
inland saltgrass	DISP	5	56 - 280	2 - 10	5	300 - 600	15 - 30	5	450 - 825	30 - 55
alkali muhly	MUAS	5	0 - 84	0 - 3	5	0 - 100	0 - 5	5	0 - 75	0 - 5
GRASS-LIKES		**6**	**0 - 224**	**0 - 8**	**6**	**0 - 100**	**0 - 5**	**6**	**0 - 30**	**0 - 2**
bulrush	SCHOE6	6	0 - 140	0 - 5	6	0 - 60	0 - 3	6	0 - 30	0 - 2
rush	JUNCU	6	0 - 140	0 - 5	6	0 - 60	0 - 3	6	0 - 30	0 - 2
sedge	CAREX	6	0 - 140	0 - 5	6	0 - 60	0 - 3	6	0 - 30	0 - 2
spikerush	ELEOC	6	0 - 84	0 - 3	6	0 - 60	0 - 3	6	0 - 30	0 - 2
NON-NATIVE GRASSES		**7**			**7**	**0 - 100**	**0 - 5**	**7**	**0 - 75**	**0 - 5**
bluegrass	POA	7			7	0 - 100	0 - 5	7	0 - 75	0 - 5
cheatgrass	BRTE	7			7	0 - 100	0 - 5	7	0 - 75	0 - 5
FORBS		*8*	*140 - 280*	*5 - 10*	*8*	*100 - 300*	*5 - 15*	*8*	*75 - 225*	*5 - 15*
alkali plantain	PLER	8	28 - 56	1 - 2	8	20 - 40	1 - 2	8	15 - 45	1 - 3
American licorice	GLLE3	8	0 - 56	0 - 2	8	0 - 20	0 - 1			
annual marshelder	IVAN2	8	0 - 56	0 - 2	8	0 - 60	0 - 3	8	0 - 75	0 - 5
aster	ASTER	8	28 - 56	1 - 2	8	0 - 20	0 - 1			
curlycup gumweed	GRSQ	8	0 - 28	0 - 1	8	20 - 40	1 - 2	8	15 - 45	1 - 3
giant sumpweed	IVXA	8	0 - 84	0 - 3	8	20 - 100	1 - 5	8	15 - 75	1 - 5
mealy goosefoot	CHIN2	8	28 - 56	1 - 2	8	20 - 60	1 - 3	8	15 - 45	1 - 3
povertyweed	IVAX	8	28 - 56	1 - 2	8	20 - 80	1 - 4	8	15 - 75	1 - 5
Pursh seepweed	SUCA2	8	0 - 84	0 - 3	8	20 - 100	1 - 5	8	15 - 75	1 - 5
red saltwort	SARU	8	28 - 56	1 - 2	8	20 - 40	1 - 2	8	15 - 30	1 - 2
seepweed	SUAED	8	0 - 84	0 - 3	8	20 - 100	1 - 5	8	15 - 75	1 - 5
silverleaf cinquefoil	POAR8	8	0 - 28	0 - 1	8	0 - 20	0 - 1			
western dock	RUAQ	8	0 - 56	0 - 2	8	0 - 40	0 - 2			
native forbs	2FN	8	0 - 140	0 - 5	8	0 - 100	0 - 5	8	0 - 45	0 - 3
introduced forbs	2FI				8	0 - 100	0 - 5	8	0 - 75	0 - 5
SHRUBS		*9*	*28 - 140*	*1 - 5*	*9*	*20 - 100*	*1 - 5*	*9*	*0 - 75*	*0 - 5*
black greasewood	SAVE4	9	0 - 84	0 - 3	9	0 - 80	0 - 4	9	0 - 75	0 - 5
fourwing saltbush	ATCA2	9	0 - 84	0 - 3	9	0 - 20	0 - 1			
Gardner's saltbush	ATGA	9	0 - 56	0 - 2	9	0 - 20	0 - 1			
rubber rabbitbrush	ERNA10	9	0 - 84	0 - 3	9	0 - 80	0 - 4	9	0 - 75	0 - 5
other shrubs	2SHRUB	9	0 - 56	0 - 2	9	0 - 40	0 - 2	9	0 - 30	0 - 2
TREES		*10*	*0 - 56*	*0 - 2*	*10*	*0 - 40*	*0 - 2*	*10*	*0 - 30*	*0 - 2*
plains cottonwood	PODEM	10	0 - 56	0 - 2	10	0 - 40	0 - 2	10	0 - 30	0 - 2

Annual Production lbs./acre	LOW RV HIGH	LOW RV HIGH	LOW RV HIGH
GRASSES & GRASS-LIKES	1750 - 2478 - 2965	1290 - 1720 - 2100	830 - 1298 - 1530
FORBS	125 - 210 - 320	95 - 200 - 345	70 - 150 - 255
SHRUBS	25 - 84 - 155	15 - 60 - 110	0 - 38 - 80
TREES	0 - 28 - 60	0 - 20 - 45	0 - 15 - 35
TOTAL	1900 - 2800 - 3500	1400 - 2000 - 2600	900 - 1500 - 1900

This list of plants and their relative proportions are based on near normal years. Fluctuations in species composition and relative production may change from year to year dependent upon precipitation or other climatic factors. RV = Representative value. Refer to PLANTS database for scientific names and codes: http://plants.usda.gov

Plant Community and Vegetation State Narratives

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

Rhizomatous Wheatgrass/Cordgrass/Alkali Sacation Plant Community

This is the interpretive plant community and is considered to be the climax plant community. This community evolved with grazing by large herbivores, occasional prairie fires and periodic flooding events and can be found on areas that are properly managed with grazing and/or prescribed burning, and sometimes on areas receiving occasional short periods of rest. The potential vegetation is about 85-95 percent grasses and grass-like plants, 5-10 percent forbs, 1-5 percent shrubs, and 0-2 percent trees. The major grasses include western wheatgrass, Nuttall's alkaligrass, alkali sacaton, and prairie or alkali cordgrass. Other grasses present include thickspike wheatgrass, inland Saltgrass, and foxtail barley. Salt tolerant forbs such as alkali plantain, western dock, and seepweed are common. The shrubs that may occur on this site include black greasewood, fourwing saltbush, and rubber rabbitbrush. Plains cottonwood may be present on this site.

This plant community is diverse, stable, productive, and well adapted to both saline soils and the Northern Great Plains climatic conditions. Community dynamics, nutrient cycle, water cycle, and energy flow are functioning properly. Litter is properly distributed with very little movement offsite and natural plant mortality is very low. This community is resistant to many disturbances except continuous grazing, tillage, and/or development into urban or other uses. The diversity in plant species allows for both the fluctuation of flooding, as well as, large variations in climate.

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

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

- Moderate, continuous season-long grazing will convert this plant community to the *Inland Saltgrass/Rhizomatous Wheatgrass Plant Community*.

Inland Saltgrass/Rhizomatous Wheatgrass Plant Community

This plant community developed from moderate, continuous season-long grazing. This plant community is made up of about 80-95 percent grasses and grass-like species, 5-15 percent forbs, 1-5 percent shrubs, and 0-2 percent trees. Lack of litter and reduced plant heights result in higher soil temperatures, poor water infiltration rates, high evapotranspiration, and increased percolation of the

high water table, which increases salt concentrations on the surface. This gives inland saltgrass and other salt tolerant species a competitive advantage over less tolerant species.

Dominant grasses include inland saltgrass, Nuttall's alkaligrass, western wheatgrass, and prairie cordgrass. Other secondary grasses include foxtail barley and thickspike wheatgrass. Forbs such as giant sumpweed, povertyweed, Pursh seepweed, and seepweed are the dominant forbs. Common shrubs include black greasewood and rubber rabbitbrush.

As long as the herbaceous component remains intact, the plant community tends to be resilient. However, species composition can be further altered through long-term heavy continuous grazing. With loss of Nuttall alkaligrass, cordgrasses, slender wheatgrass, and much of the western wheatgrass, inland saltgrass becomes the dominant species. This plant community is relatively stable and well adapted to increased salinity. Plant vigor, litter, plant density, and production have decreased. The biological integrity, water, and nutrient cycles of this plant community are becoming impaired.

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

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

- Frequent and severe grazing will convert this plant community to the *Inland Saltgrass Plant Community*.

- Prescribed grazing will convert this plant community to the *Rhizomatous Wheatgrass/Cordgrass/Alkali Sacaton Plant Community*.

Inland Saltgrass Plant Community

This plant community is the result of long-term improper grazing with inadequate recovery periods. Patches of inland saltgrass sod are typical and foxtail barley is well distributed throughout the community. Nuttall's alkaligrass and western wheatgrass have been reduced and may persist in remnant amounts, reduced in vigor. Bare ground may develop in micro lows where salt concentrations are highest. A white salt crust is common on the surface. Only a few very salt tolerant annuals, such as povertyweed and seepweed, can survive.

This plant community is resistant to change due to the grazing tolerance of inland saltgrass and increased surface salts. A significant amount of production and diversity has been lost when compared to the climax plant community. Loss of key cool-season grasses and increased bare ground has negatively impacted energy flow and nutrient cycling. Water infiltration is reduced significantly due to the massive shallow root system "root pan," characteristic of inland saltgrass, and increased bare ground.

It will take a long time to bring this plant community back to the *Rhiomatous Wheatgrass/Cordgrass/Alkali Sacaton* with management alone. Renovation (mechanical and/or chemical inputs) is not recommended due to high salt content of the soil and saltgrass persistence.

The soils of this plant community are not well protected. The biotic integrity is compromised by introduced species, loss of the dominant climax species, and bare ground. Excessive runoff may occur.

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: SD6009
Growth curve name: Pierre Shale Plains, warm-season dominant, cool-season subdominant.
Growth curve description: Warm-season dominant, cool-season subdominant, lowland.

JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
0	0	3	10	16	22	23	14	7	5	0	0

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

- Under long-term prescribed grazing, including adequate rest periods, this plant community will move through the successional stages, and may eventually lead towards the *Rhizomatous Wheatgrass/Cordgrass/Alkali Sacaton Plant Community.*

Ecological Site Interpretations

Animal Community – Wildlife Interpretations

-- Under Development --

Rhizomatous Wheatgrass Plant Community:

Inland Saltgrass/Rhizomatous Wheatgrass Plant Community:

Inland Saltgrass Plant Community:

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

Common Name	Cattle				Sheep				Horses				Deer				Antelope				Bison				Elk			
Grasses & Grass-likes																												
alkali cordgrass	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
alkali muhly	U	U	D	U	U	U	D	U	U	U	D	U	N	N	N	N	N	N	N	N	U	U	D	U	U	U	D	U
alkali sacaton	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
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
bulrush	U	U	U	U	N	N	N	N	U	U	U	U	N	N	N	N	N	N	N	N	U	U	U	U	U	U	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
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
Nuttall's alkaligrass	U	P	D	D	P	P	P	P	U	P	D	D	P	P	P	P	P	P	P	P	U	P	D	D	U	P	D	D
plains bluegrass	U	D	U	D	N	D	N	U	U	D	U	D	U	P	N	D	U	P	N	D	U	D	U	D	U	D	U	D
prairie cordgrass	U	D	D	U	N	N	N	N	U	D	D	U	N	N	N	N	N	N	N	N	U	D	D	U	U	D	D	U
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
sedge	U	D	U	D	U	P	N	D	U	D	U	D	U	D	U	D	U	D	U	D	U	D	U	D	U	D	U	D
slender wheatgrass	U	P	U	U	N	D	U	N	U	P	U	U	N	D	U	N	N	D	U	N	U	P	U	U	U	P	U	U
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
thickspike wheatgrass	U	D	D	U	N	D	N	N	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	U	N	D	N	N	U	P	D	U	N	D	N	N	N	D	N	N	U	P	D	U	U	P	D	U
Forbs																												
alkali plantain	U	D	U	U	N	U	U	N	U	D	U	U	N	U	U	N	N	U	U	N	U	D	U	U	N	U	U	N
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
annual marshelder	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	N	U	N
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
curlycup gumweed	U	U	U	U	N	N	N	N	U	U	U	U	N	N	N	N	N	N	N	N	U	U	U	U	N	N	N	N
giant sumpweed	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	N	U	N
povertyweed	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
Pursh seepweed	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
red saltwort	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
seepweed	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
silverleaf cinquefoil	U	U	D	U	U	U	U	U	U	U	D	U	U	U	U	U	U	U	U	U	U	U	D	U	U	U	U	U
western dock	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																												
black greasewood	U	D	D	U	T	T	T	T	U	D	D	U	D	U	U	D	D	U	U	D	U	D	D	U	D	U	U	U
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
Gardner's 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
rubber rabbitbrush	N	N	N	N	D	U	U	D	N	N	N	N	D	U	U	D	U	D	D	U	N	N	N	N	D	U	U	U
Trees																												
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/Cordgrass/Alkali Sacaton	2800	0.78
Inland Saltgrass/Rhizomatous Wheatgrass	2000	0.55
Inland Saltgrass	1500	0.41

*Based on 912 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).

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

Hydrology Functions

Water is the principal factor limiting forage production on this site. This site is dominated by soils in hydrologic group D. Infiltration is very slow to slow and runoff potential is very high depending on slope and ground cover. In many cases, areas with greater than 75 percent ground cover have the greatest potential for high infiltration and lower runoff. An example of an exception would be where shortgrasses form a strong sod and dominate the site. Areas where ground cover is less than 50 percent have the greatest potential to have reduced infiltration and higher runoff (refer to Section 4, NRCS National Engineering Handbook for runoff quantities and hydrologic curves).

Recreational Uses

This site provides hunting, hiking, photography, bird watching, and other opportunities. The wide varieties of plants that bloom from spring until fall have an aesthetic value that appeals to visitors.

Wood Products

No appreciable wood products are typically present on this site.

Other Products

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

Supporting Information

Associated Sites
Claypan (R063AY013SD), Wet Land (R063AY002SD), Thin Claypan (R063AY015SD).

Similar Sites
(R063AY019SD) – Closed Depression [more western wheatgrass, more dock and smartweed; higher production]

Inventory Data References
Information presented here has been derived from NRCS clipping data and other inventory data. Field observations from range-trained personnel were also used. Those involved in developing this site include: April Boltjes, Range Management Specialist (RMS), NRCS; Stan Boltz, RMS, NRCS; Kent Cooley, Soil Scientist, NRCS; Rick Peterson, RMS, NRCS; and L. Michael Stirling, RMS, NRCS.

Data Source	Number of Records	Sample Period	State	County
SCS-RANGE-417	0			

State Correlation
MLRA 63A lies entirely within SD, so no cross-state correlation has occurred.

Field Offices/Counties

Dupree, SD	Ziebach	McIntosh, SD	Corson	Pierre, SD	Hughes/Stanley
Faith, SD	Meade	Mound City, SD	Campbell	Selby, SD	Walworth
Gettysburg, SD	Potter	Murdo, SD	Jones	Timber Lake, SD	Dewey
Kadoka, SD	Jackson	Onida, SD	Sully	Wall, SD	East Pennington
Kennebec, SD	Lyman	Philip, SD	Haakon	White River, SD	Mellette

Relationship to Other Established Classifications
Level IV Ecoregions of the Conterminous United States: 43c – River Breaks and 43f – Subhumid Pierre Shale Plains.

Other References
High Plains Regional Climate Center, University of Nebraska, 830728 Chase Hall, Lincoln, NE 68583-0728. (http://www.hprcc.unl.edu/)
USDA, NRCS. National Water and Climate Center, 101 SW Main, Suite 1600, Portland, OR 97204-3224. (http://www.wcc.nrcs.usda.gov/)
USDA, NRCS. National Range and Pasture Handbook, September 1997
USDA, NRCS. National Soil Information System, Information Technology Center, 2150 Centre Avenue, Building A, Fort Collins, CO 80526. (http://nasis.nrcs.usda.gov)
USDA, NRCS. 2001. The PLANTS Database, Version 3.1 (http://plants.usda.gov). National Plant Data Center, Baton Rouge, LA 70874-4490 USA
USDA, NRCS, Various Published Soil Surveys

Site Description Approval

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SD, State Range Management Specialist Date