

## United States Department of Agriculture Natural Resources Conservation Service

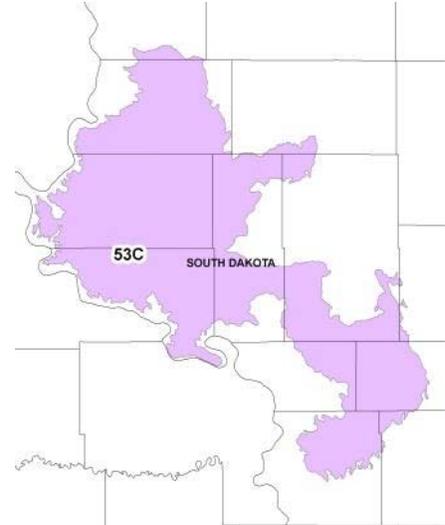
### Ecological Site Description

**Site Type:** Rangeland

**Site Name:** Wet Land

**Site ID:** R053CY002SD

**Major Land Resource Area (MLRA):** 53C – Southern Dark Brown Glaciated Plains



### Physiographic Features

This site occurs on nearly level drainageways.

**Landform:** floodplains, potholes

**Aspect:** N/A

	<u>Minimum</u>	<u>Maximum</u>
<b>Elevation (feet):</b>	1,300	2,300
<b>Slope (percent):</b>	0	1
<b>Water Table Depth (inches):</b>	0	24
<b>Flooding:</b>		
<b>Frequency:</b>	Occasional	Frequent
<b>Duration:</b>	Brief	Long
<b>Ponding:</b>		
<b>Depth (inches):</b>	None	None
<b>Frequency:</b>	None	None
<b>Duration:</b>	None	None
<b>Runoff Class:</b>	Negligible	Low

### Climatic Features

MLRA 53C is considered to have a continental climate – cold winters and hot summers, low humidity, light rainfall, and much sunshine. Extremes in temperature may also abound. The climate is the result of this MLRA's location near the geographic center of North America. There are few natural barriers on the Northern Great Plains and air masses move freely across the plains and account for rapid changes in temperature.

Annual precipitation typically ranges from 18 to 22 inches per year. The average annual temperature is about 45°F. January is the coldest month with average temperatures ranging from about 15°F (Stephan, South Dakota (SD)), to about 16°F (Onida 4 NW, SD). July is the warmest month with temperatures averaging from about 72°F (Stephan, SD), to about 74°F (Onida 4 NW, 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 12 miles per hour (mph) annually, ranging from about 13 mph during the spring to about 11 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 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>
<b>Frost-free period (days):</b>	125	141
<b>Freeze-free period (days):</b>	142	160
<b>Mean Annual Precipitation (inches):</b>	18	22

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

	Precip. Min.	Precip. Max	Temp. Min.	Temp. Max.
January	0.25	0.56	3.6	26.4
February	0.37	0.57	7.8	30.9
March	1.02	1.04	19.5	43.1
April	1.68	3.01	31.0	58.7
May	2.68	3.35	42.6	70.1
June	3.17	3.41	53.3	79.1
July	2.50	3.34	58.7	88.7
August	1.73	2.06	56.8	87.6
September	1.94	2.48	47.3	77.3
October	1.35	1.67	33.7	62.3
November	0.52	0.77	20.8	42.4
December	0.21	0.34	8.5	31.2

Climate Stations		Period	
Station ID	Location or Name	From	To
SD3608	Harrold 12 SSW	1963	2008
SD6292	Onida 4 NW	1913	2008
SD7992	Stephan	1903	2008
SD9077	Wessington Springs 7 SW	1948	1998

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

**Riparian and Wetland Features**

<b>Wetland Description:</b>	<u>System</u>	<u>Subsystem</u>	<u>Class</u>	<u>Sub-class</u>
Cowardin, et al., 1979	Palustrine	N/A	Persistent Emergent Wetland	Semi-permanent or seasonally flooded or Saturated

**Representative Soil Features**

These are very deep, poorly to very poorly drained, fine textured soils. Salinity and sodicity are none to slight. Water tables on this site range from about 9 to 24 inches below the surface during most of the growing season. This site occurs mainly along flood plains and in potholes. Slope ranges from zero to one percent. 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. The high water table and slow permeability strongly influences the soil-water-plant relationship.

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

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

	<u>Minimum</u>	<u>Maximum</u>
Drainage Class:	very poorly	very poorly
Permeability Class:	slow	slow
Depth (inches):	80	80
Electrical Conductivity (mmhos/cm)*:	0	4
Sodium Absorption Ratio*:	0	2
Soil Reaction (1:1 Water)*:	7.4	8.4
Soil Reaction (0.1M CaCl2)*:	NA	NA
Available Water Capacity (inches)*:	7	7
Calcium Carbonate Equivalent (percent)*:	5	45

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

## Plant Communities

### Ecological Dynamics of the Site

The site developed under Northern Great Plains climatic conditions and included natural influence of large herding herbivores and occasional fire. Changes will occur in the plant communities due to weather fluctuations and/or management actions. Under adverse impacts, a relatively rapid decline in vegetative vigor and composition can occur. Under favorable conditions, the site has the potential to resemble the Reference State. Interpretations for this site are based primarily on the Prairie Cordgrass/Reedgrass/Sedge Plant Community Phase. This community phase and the Reference State has been determined by study of rangeland relic areas, areas protected from excessive disturbance, and areas under long-term rotational grazing regimes. Trends in plant community dynamics ranging from heavily grazed to lightly grazed areas, seasonal use pastures, and historical accounts also have been considered. Community phases, community pathways, states, transitions, thresholds, and restoration pathways have been determined through similar studies and experience.

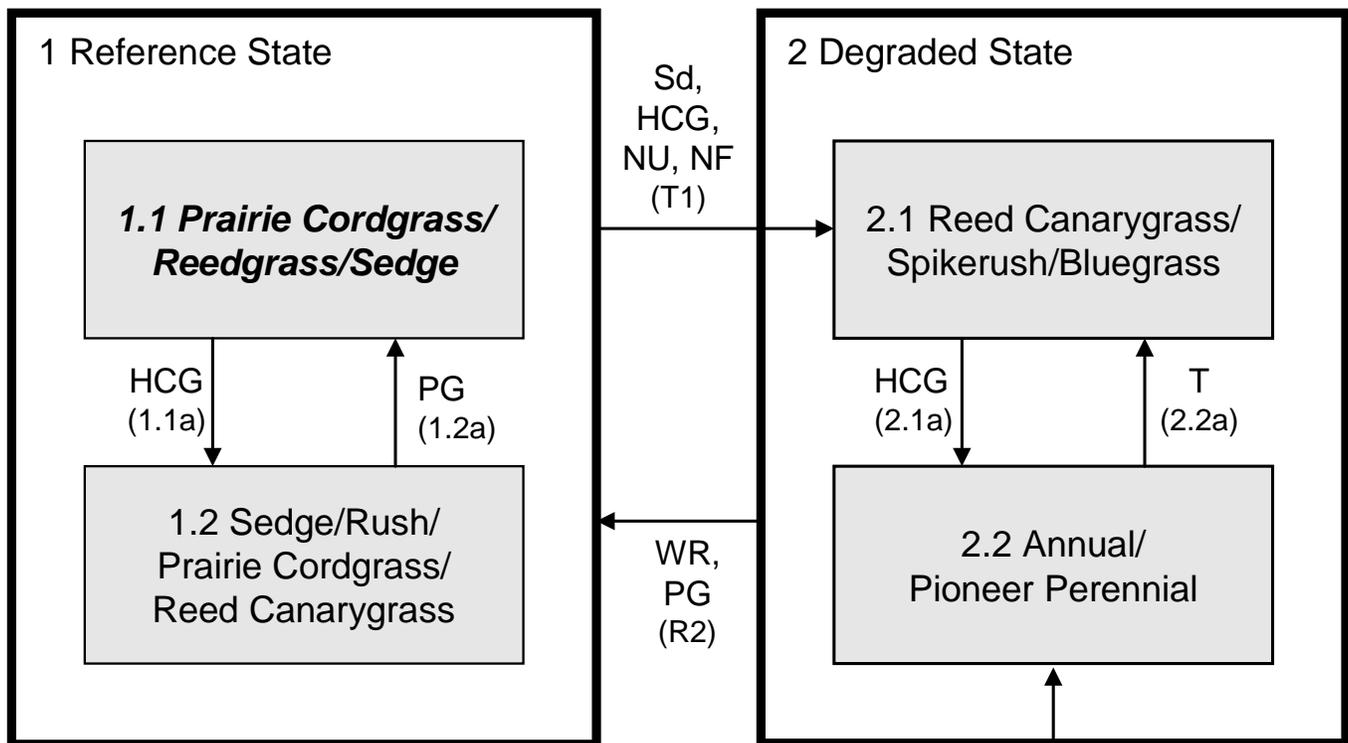
The natural disturbance regime consisted of occasional fires caused both by natural and Native American ignition sources. These fires occurred during any season of the year but were concentrated in the spring and late summer or early fall. Lightning fires occurred most frequently in July and August while fires started by Native Americans occurred in April, September, and October. Large ungulate grazing was heavy and occurred often but usually for short durations. Grazing may have been severe when occurring after a fire event. The grazing and fire interaction especially when coupled with drought events, set up the dynamics discussed and displayed in the following state and transition diagram and descriptions.

This ecological site (ES) has been grazed by domestic livestock since introduced into the area. The introduction of domestic livestock and the use of fencing and reliable water sources have changed the disturbance regime of this site. Heavy continuous grazing without adequate recovery periods following each grazing occurrence causes this site to depart from the Reference State. Species such as fowl bluegrass, spikerush, and rush will increase. Prairie cordgrass and northern reedgrass will decrease in frequency and production.

Following the state and transition diagram are narratives for each of the described states and community phases. These may not represent every possibility but they are the most prevalent and repeatable states/community phases. The plant composition tables shown below have been developed from the best available knowledge at the time of this revision. As more data is collected, some of these community phases and/or states may be revised or removed and new ones may be added. The main purpose for including the descriptions here is to capture the current knowledge and experience at the time of this revision.

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

### Plant Communities and Transitional Pathways



Refer to narrative for details on pathways: **CA** – Cropped and abandoned; **HCG** – Heavy continuous grazing; **NU, NF** – Non-use, no fire; **PG** – Prescribed grazing with adequate recovery periods; **Sd** – Sedimentation; **T** – Time w/wo disturbances; **WR** – Wetland restoration.

CA (T3)  
**Any Plant Community**

Plant Community Composition and Group Annual Production

			1.1 Prairie Cordgrass/Reedgrass/Sedge		
COMMON/GROUP NAME	SCIENTIFIC NAME	SYMBOL	Group	lbs./acre	% Comp
<b>GRASSES &amp; GRASS-LIKES</b>				5100 - 5400	85 - 90
<b>TALL WARM-SEASON GRASSES</b>			1	1200 - 3000	20 - 50
prairie cordgrass	Spartina pectinata	SPPE	1	1200 - 2700	20 - 45
green muhly	Muhlenbergia glomerata	MUGL3	1	0 - 300	0 - 5
switchgrass	Panicum virgatum	PAVI2	1	0 - 300	0 - 5
<b>COOL-SEASON GRASSES</b>			2	600 - 1500	10 - 25
northern reedgrass	Calamagrostis stricta ssp. inexpansa	CASTI3	2	240 - 720	4 - 12
bluejoint reedgrass	Calamagrostis canadensis	CACA4	2	180 - 600	3 - 10
narrow reedgrass	Calamagrostis stricta ssp. stricta	CASTS5	2	60 - 480	1 - 8
fowl mannagrass	Glyceria striata	GLST	2	60 - 300	1 - 5
reed canarygrass	Phalaris arundinacea	PHAR3	2	60 - 300	1 - 5
slender wheatgrass	Elymus trachycaulus	ELTR7	2	0 - 180	0 - 3
<b>GRASS-LIKES</b>			3	600 - 1200	10 - 20
fox sedge	Carex vulpinoidea	CAVU2	3	120 - 600	2 - 10
woolly sedge	Carex pellita	CAPE42	3	120 - 600	2 - 10
bottlebrush sedge	Carex hystericina	CAHY4	3	60 - 300	1 - 5
yellow nutsedge	Cyperus esculentus L.	CYES	3	0 - 180	0 - 3
smoothcone sedge	Carex laeviconica	CALA12	3	60 - 300	1 - 5
rush	Juncus spp.	JUNCU	3	60 - 300	1 - 5
spikerush	Eleocharis spp.	ELEOC	3	60 - 180	1 - 3
bulrush	Schoenoplectus spp.	SCHOE6	3	0 - 180	0 - 3
other grass-likes		2GL	3	0 - 180	0 - 3
<b>OTHER NATIVE GRASSES</b>			4	60 - 600	1 - 10
Canada wildrye	Elymus canadensis	ELCA4	4	60 - 300	1 - 5
plains bluegrass	Poa arida	POAR3	4	0 - 180	0 - 3
fowl bluegrass	Poa palustris	POPA2	4	0 - 180	0 - 3
other grasses		2GRAM	4	0 - 300	0 - 5
<b>FORBS</b>			5	300 - 600	5 - 10
American licorice	Glycyrrhiza lepidota	GLLE3	5	60 - 120	1 - 2
broadfruit burreed	Sparganium eurycarpum	SPEU	5	0 - 180	0 - 3
broadleaf cattail	Typha latifolia	TYLA	5	0 - 120	0 - 2
brook cinquefoil	Potentilla rivalis	PORI3	5	0 - 60	0 - 1
common arrowhead					
common boneset	Eupatorium perfoliatum	EUPE3	5	0 - 60	0 - 1
common waterparsnip	Sium suave	SISU2	5	0 - 60	0 - 1
giant goldenrod	Solidago gigantea	SOGI	5	60 - 180	1 - 3
heartleaf Alexanders	Zizia aptera	ZIAP	5	60 - 120	1 - 2
Macoun's buttercup	Ranunculus macounii	RAMA2	5	0 - 120	0 - 2
marsh fleabane	Senecio congestus	SECO2	5	0 - 60	0 - 1
marsh skullcap	Scutellaria galericulata	SCGA	5	60 - 120	1 - 2
Maximilian sunflower	Helianthus maximiliani	HEMA2	5	60 - 120	1 - 2
meadow anemone	Anemone canadensis	ANCA8	5	60 - 120	1 - 2
New England aster	Symphyotrichum novae-angliae	SYNO2	5	0 - 180	0 - 3
nodding beggartick	Bidens cernua	BICE	5	60 - 120	1 - 2
northern water plantain	Alisma triviale	ALTR7	5	0 - 60	0 - 1
Pennsylvania smartweed				0 - 120	0 - 2
prairie ironweed	Vernonia fasciculata	VEFA2	5	60 - 120	1 - 2
rough bugleweed	Lycopus asper	LYAS	5	0 - 60	0 - 1
silverweed cinquefoil	Argentina anserina	ARAN7	5	0 - 60	0 - 1
spotted water hemlock	Cicuta maculata	CIMA2	5	0 - 120	0 - 2
water smartweed	Polygonum amphibium	POAM8	5	0 - 120	0 - 2
western dock	Rumex aquaticus	RUAQ	5	0 - 60	0 - 1
white panicle aster	Symphyotrichum lanceolatum	SYLA6	5	60 - 120	1 - 2
wild mint	Mentha arvensis	MEAR4	5	60 - 120	1 - 2
wild strawberry	Fragaria virginiana	FRVI	5	0 - 60	0 - 1
native forbs		2FN	5	60 - 240	1 - 4
<b>SHRUBS</b>			6	60 - 300	1 - 5
false indigo	Amorpha fruticosa	AMFR	6	60 - 180	1 - 3
meadow willow	Salix petiolaris	SAPE5	6	0 - 180	0 - 3
Missouri River willow	Salix eriocephala	SAER	6	0 - 180	0 - 3
sandbar willow	Salix interior	SAIN3	6	0 - 180	0 - 3
other shrubs		2SHRUB	6	0 - 180	0 - 3

Annual Production lbs./acre	LOW	RV	HIGH
<b>GRASSES &amp; GRASS-LIKES</b>	4690	5370	-5935
<b>FORBS</b>	255	450	-720
<b>SHRUBS</b>	55	180	-345
<b>TOTAL</b>	5000	6000	-7000

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

Plant Community Composition and Group Annual Production

COMMON/GROUP NAME	SYMBOL	1.1 Prairie Cordgrass/Reedgrass/ Sedge			1.2 Sedge/Rush/Prairie Cordgrass/ Reed Canarygrass			2.1 Reed Canarygrass/ Spikerush/Bluegrass		
		Grp	lbs./acre	% Comp	Grp	lbs./acre	% Comp	Grp	lbs./acre	% Comp
<b>GRASSES &amp; GRASS-LIKES</b>			5100 - 5400	85 - 90		4000 - 4500	80 - 90		3200 - 3600	80 - 90
<b>TALL WARM-SEASON GRASSES</b>		1	1200 - 3000	20 - 50	1	250 - 1250	5 - 25	1	0 - 200	0 - 5
prairie cordgrass	SPPE	1	1200 - 2700	20 - 45	1	250 - 1250	5 - 25	1	0 - 200	0 - 5
green muhly	MUGL3	1	0 - 300	0 - 5						
switchgrass	PAV12	1	0 - 300	0 - 5	1	0 - 100	0 - 2			
<b>COOL-SEASON GRASSES</b>		2	600 - 1500	10 - 25	2	250 - 750	5 - 15	2	600 - 1400	15 - 35
northern reedgrass	CASTI3	2	240 - 720	4 - 12	2	0 - 250	0 - 5			
bluejoint reedgrass	CACA4	2	180 - 600	3 - 10	2	0 - 200	0 - 4			
narrow reedgrass	CASTS5	2	60 - 480	1 - 8	2	0 - 150	0 - 3			
fowl mannagrass	GLST	2	60 - 300	1 - 5	2	0 - 500	0 - 10		600 - 2400	15 - 60
reed canarygrass	PHAR3	2	60 - 300	1 - 5	2	100 - 600	2 - 12	2	600 - 1400	15 - 35
slender wheatgrass	ELTR7	2	0 - 180	0 - 3						
<b>GRASS-LIKES</b>		3	600 - 1200	10 - 20	3	750 - 2250	15 - 45	3	600 - 1800	15 - 45
fox sedge	CAVU2	3	120 - 600	2 - 10	3	50 - 750	1 - 15	3	0 - 200	0 - 5
woolly sedge	CAPE42	3	120 - 600	2 - 10	3	50 - 750	1 - 15	3	0 - 200	0 - 5
bottlebrush sedge	CAHY4	3	60 - 300	1 - 5	3	50 - 500	1 - 10	3	0 - 200	0 - 5
smoothcone sedge	CALA12	3	60 - 300	1 - 5	3	50 - 500	1 - 10	3	0 - 120	0 - 3
Yellow nutsedge	CYES	3	0 - 180	0 - 3	3	0 - 50	0 - 1	3	0 - 400	0 - 10
rush	JUNCU	3	60 - 300	1 - 5	3	100 - 750	2 - 15	3	200 - 800	5 - 20
spikerush	ELEOC	3	60 - 180	1 - 3	3	100 - 400	2 - 8	3	400 - 1000	10 - 25
bulrush	SCHOE6	3	0 - 180	0 - 3	3	0 - 200	0 - 4	3	0 - 80	0 - 2
other grass-likes	2GL	3	0 - 180	0 - 3	3	0 - 150	0 - 3	3	0 - 40	0 - 1
<b>OTHER NATIVE GRASSES</b>		4	60 - 600	1 - 10	4	250 - 750	5 - 15	4	200 - 600	5 - 15
Canada wildrye	ELCA4	4	60 - 300	1 - 5	4	0 - 100	0 - 2			
plains bluegrass	POAR3	4	0 - 180	0 - 3	4	50 - 400	1 - 8	4	80 - 400	2 - 10
fowl bluegrass	POPA2	4	0 - 180	0 - 3	4	50 - 400	1 - 8	4	80 - 400	2 - 10
other grasses	2GRAM	4	0 - 300	0 - 5	4	0 - 250	0 - 5	4	0 - 200	0 - 5
<b>FORBS</b>		5	300 - 600	5 - 10	5	250 - 750	5 - 15	5	200 - 600	5 - 15
American licorice	GLLE3	5	60 - 120	1 - 2	5	50 - 150	1 - 3	5	0 - 80	0 - 2
broadfruit burreed	SPEU	5	0 - 180	0 - 3	5	0 - 250	0 - 5	5	0 - 40	0 - 1
broadleaf cattail	TYLA	5	0 - 120	0 - 2	5	0 - 200	0 - 4	5	40 - 240	1 - 6
brook cinquefoil	PORI3	5	0 - 60	0 - 1	5	0 - 50	0 - 1			
common boneset	EUPE3	5	0 - 60	0 - 1						
common waterparsnip	SISU2	5	0 - 60	0 - 1						
giant goldenrod	SOGI	5	60 - 180	1 - 3	5	50 - 300	1 - 6	5	40 - 320	1 - 8
heartleaf Alexanders	ZIAP	5	60 - 120	1 - 2	5	0 - 50	0 - 1			
Macoun's buttercup	RAMA2	5	0 - 120	0 - 2	5	0 - 50	0 - 1			
marsh fleabane	SECO2	5	0 - 60	0 - 1						
marsh skullcap	SCGA	5	60 - 120	1 - 2	5	0 - 50	0 - 1			
Maximilian sunflower	HEMA2	5	60 - 120	1 - 2	5	0 - 50	0 - 1			
meadow anemone	ANCA8	5	60 - 120	1 - 2	5	0 - 50	0 - 1			
New England aster	SYNO2	5	0 - 180	0 - 3	5	50 - 250	1 - 5	5	40 - 240	1 - 6
nodding beggartick	BICE	5	60 - 120	1 - 2	5	0 - 50	0 - 1			
northern water plantain	ALTR7	5	0 - 60	0 - 1						
Pennsylvania smartweed										0 35
prairie ironweed	VEFA2	5	60 - 120	1 - 2	5	0 - 50	0 - 1			
rough bugleweed	LYAS	5	0 - 60	0 - 1						
silverweed cinquefoil	ARAN7	5	0 - 60	0 - 1	5	0 - 50	0 - 1			
spotted water hemlock	CIMA2	5	0 - 120	0 - 2	5	0 - 100	0 - 2	5	0 - 40	0 - 1
water smartweed	POAM8	5	0 - 120	0 - 2	5	0 - 100	0 - 2	5	0 - 40	0 - 1
western dock	RUAQ	5	0 - 60	0 - 1						
white panic aster	SYLA6	5	60 - 120	1 - 2	5	50 - 150	1 - 3	5	40 - 160	1 - 4
wild mint	MEAR4	5	60 - 120	1 - 2	5	0 - 50	0 - 1			
wild strawberry	FRVI	5	0 - 60	0 - 1						
native forbs	2FN	5	60 - 240	1 - 4	5	0 - 150	0 - 3	5	0 - 80	0 - 2
introduced forbs	2FI				5	50 - 200	1 - 4	5	40 - 280	1 - 7
<b>SHRUBS</b>		6	60 - 300	1 - 5	6	50 - 250	1 - 5	6	0 - 120	0 - 3
false indigo	AMFR	6	60 - 180	1 - 3	6	50 - 250	1 - 5	6	0 - 120	0 - 3
meadow willow	SAPE5	6	0 - 180	0 - 3	6	0 - 50	0 - 1			
Missouri River willow	SAER	6	0 - 180	0 - 3	6	0 - 50	0 - 1			
sandbar willow	SAIN3	6	0 - 180	0 - 3	6	0 - 50	0 - 1			
other shrubs	2SHRUB	6	0 - 180	0 - 3	6	0 - 100	0 - 2	6	0 - 40	0 - 1
<b>Annual Production lbs./acre</b>			LOW RV HIGH		LOW RV HIGH		LOW RV HIGH		LOW RV HIGH	
<b>GRASSES &amp; GRASS-LIKES</b>			4690 - 5370 - 5935		3740 - 4350 - 4815		2825 - 3540 - 4150			
<b>FORBS</b>			255 - 450 - 720		215 - 500 - 900		175 - 400 - 720			
<b>SHRUBS</b>			55 - 180 - 345		45 - 150 - 285		0 - 60 - 130			
<b>TOTAL</b>			5000 - 6000 - 7000		4000 - 5000 - 6000		3000 - 4000 - 5000			

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

### Reference State (State 1)

This state represents the natural range of variability that dominates the dynamics of this ES. This state is typically codominated by cool-season grass and grass-like species, and warm-season grasses. Before European settlement, the primary disturbance mechanisms for this site in the reference condition included sporadic fire and grazing by large herding ungulates. Timing of fires and grazing coupled with weather events dictated the dynamics that occurred within the natural range of variability. Today, the primary disturbance is from a lack of fire and concentrated livestock grazing. Grasses that are desirable for livestock and wildlife can decline and a corresponding increase in less desirable grasses will occur.

### 1.1 Prairie Cordgrass/Reedgrass/Sedge Plant Community Phase

This community evolved with grazing by large herbivores, occasional prairie fires, and relatively frequent flooding 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 65 percent grasses, 20 percent grass-like species, 10 percent forbs, and 5 percent shrubs by air-dry weight. Prairie cordgrass is the dominant tall warm-season grass occupying this plant community. Reedgrasses are the dominant tall cool-season species. A variety of sedges and rushes occur throughout this community, as well as, fowl mannagrass, switchgrass, reed canarygrass, plains bluegrass, and fowl bluegrass. Key forbs include broadfruit burreed, giant goldenrod, New England aster, Maximilian sunflower, white panicle aster, and cinquefoil.

This plant community phase is diverse, stable, and productive, and is well adapted to the Northern Great Plains. The high water table supplies much of the moisture for plant growth. 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 the variability of both the fluctuations of water table and reoccurring flooding. This is a sustainable plant community in terms of soil stability, watershed function, and biologic integrity.

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: SD5309

Growth curve name: Southern Dark Brown Glaciated 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 were as follows:

- 1.1a – Heavy continuous grazing at the same time of year, each year, without adequate recovery periods or chronic heavy grazing will shift this community to the 1.2 Sedge/Rush/Prairie Cordgrass/Reed Canarygrass Plant Community Phase.

### 1.2 Sedge/Rush/Prairie Cordgrass/Reed Canarygrass Plant Community Phase

This community develops with periods of heavy continuous grazing with lack of adequate recovery periods during the growing season following periods of below normal precipitation. Lack of litter and reduced plant heights result in higher soil temperatures and reduced water infiltration rates.

Recognition of this plant community will enable the land user to implement key management decisions before a significant ecological threshold is crossed. Prairie cordgrass has been reduced in this plant community but still persists. Sedge, rush, and other grass-like species are dominant. The grass-like species have increased while the reedgrass species have been significantly reduced. Switchgrass may be removed at this stage. Reed canarygrass may begin to increase significantly. Forb species would include asters, goldenrod, and cinquefoil, as well as, a possible invasion of Canada thistle. Plant production and frequency have been reduced. The water cycle, nutrient cycle, and energy flow are slightly reduced but continue to function adequately.

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: SD5307

Growth curve name: Southern Dark Brown Glaciated 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:

- 1.2a – Prescribed grazing that includes alternating season of utilization while providing adequate rest recovery periods of periodic light to moderate grazing will shift this plant community to the 1.1 Prairie Cordgrass/Reedgrass/Sedge Plant Community Phase.

### Transition from Reference State (State 1) to the Degraded State (State 2)

- T1 – Sedimentation beyond normal levels due to increased flooding or non-use and no fire for extended periods of time (typically for 10 or more years) causing litter levels to become high enough to reduce native grass vigor, diversity, and density, or heavy continuous grazing at the same time of year each year without adequate recovery periods or chronic heavy grazing will shift this community to the 2.1 Reed Canarygrass/Spikerush/Bluegrass Plant Community Phase within the 2.0 Degraded State.

### Degraded State (State 2)

This state is characterized by the degradation of the biotic integrity of the site due to excessive disturbance resulting in dominance by highly competitive species such as reed canarygrass, and possibly the invasion of nonnative species. Loss of diversity and reduction of plant vigor and production have negatively impacted energy flow and nutrient cycling. Infiltration is reduced and native plant mortality is increased. As the disturbance level increases, native plant density decreases even more, giving way to annual species and invasive perennial species, as well as, an increase in bare ground.

### 2.1 Reed Canarygrass/Spikerush/Bluegrass Plant Community Phase

This plant community phase develops either with increased sedimentation, heavy continuous grazing, or with a long-term lack of grazing and/or fire. In each case, native plant vigor is reduced allowing the increase of competitive species and eventually the introduction of nonnative species. Spikerush and other grass-like species, as well as, bluegrasses will increase. The more competitive forbs will also increase. Reed canarygrass often will increase to the point of dominance while prairie cordgrass will diminish significantly. Other invasive plants such as creeping meadow foxtail or Canada thistle may become prevalent if a seed source is present or nearby.

Nutrient cycling will be greatly diminished and the energy flow will shift significantly and be reduced as well. Infiltration will be reduced somewhat compared to the Reference State. This plant community is somewhat resistant to change. The combination of both grazing and fire is most effective in moving this plant community towards the Reference State.

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: SD5306

Growth curve name: Southern Dark Brown Glaciated 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

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

- 2.1a – Heavy Continuous Grazing at the same time of year, each year, without adequate recovery periods or chronic heavy grazing will shift this community to the 2.2 Annual/Pioneer Perennial Plant Community Phase.

## 2.2 Annual/Pioneer Perennial Plant Community Phase

This plant community develops under severe disturbance, typically abandonment after cropping. The dominant vegetation includes pioneer annual or perennial grasses, forbs, invaders, and early successional biennial and perennial species. Grasses may include inland saltgrass, foxtail barley, barnyardgrass, quackgrass, fowl bluegrass, Kentucky bluegrass, Baltic rush, and sedges. The dominant forbs may include cocklebur, Canada thistle and other early successional species. The community is susceptible to invasion of nonnative species due to severe soil disturbances and relatively high percent of bare ground. This plant community is resistant to change as long as soil disturbance or severe vegetation defoliation persists, thus holding back secondary plant succession.

Significant economic inputs, management, and time would be required to move this plant community toward a higher successional stage. Secondary succession is highly variable depending upon availability and diversity of a viable reproductive source of higher successional species. This plant community may be renovated to improve the production capability but management changes would be needed to maintain the new plant community. The total annual production ranges from 500 to 1,500 lbs./ac. (air-dry weight) depending upon growing conditions. No growth curve has been assigned to this plant community phase due to the highly variable nature of the plant community.

No growth curve has been assigned to this plant community phase.

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

- 2.2a – Time. This community pathway occurs with the passage of time as successional processes take place and perennial plants gradually begin to establish on the site again. This pathway will shift this plant community to the 2.1 Reed Canary/Spikerush/Bluegrass Plant Community Phase. This will likely take a long period of time and/or management. Success may be unattainable with time alone.

## Restoration Pathway from Degraded State (State 2) to the Reference State (State 1)

- R2 – Wetland Restoration coupled with Prescribed Grazing that includes alternating season of utilization while providing adequate rest recovery periods of periodic light to moderate grazing

will shift this plant community to the 1.0 Reference State. Note that wetland restoration techniques can be costly, and results may not be satisfactory

## **Ecological Site Interpretations**

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

-- Under Development --

**Prairie Cordgrass/Reedgrass/Sedge Plant Community Phase (1.1):**

**Sedge/Rush/Prairie Cordgrass/Reed Canarygrass Plant Community Phase (1.2):**

**Reed Canarygrass/Spikerush/Bluegrass Plant Community Phase (2.1):**

**Annual/Pioneer Perennial Plant Community Phase (2.2):**

### Animal Preferences (Quarterly – 1,2,3,4<sup>†</sup>)

Common Name	Cattle	Sheep	Horses	Deer	Antelope	Bison	Elk
<b>Grasses and Grasslikes</b>							
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
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
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
northern reedgrass	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
bluejoint reedgrass	U P D U	N D U N	U P D U	N D U N	N D U N	U P D U	U P D U
narrow reedgrass	U P U D	N D U N	U P U D	N D U N	N D U N	U P U D	U P U D
fowl mannagrass	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
reed canarygrass	U D U U	N N N N	U D U U	N N N N	N N N N	U D U U	U D U U
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
fox sedge	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
woolly sedge	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
bottlebrush sedge	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
smoothcone sedge	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
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
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
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
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
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
fowl bluegrass	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 N
<b>Forbs</b>							
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
broadfruit burreed	N U U N	N D D U	N U U N	N D D U	N D D U	N U U N	N U U N
broadleaf cattail	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
brook 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
common 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
common waterparsnip	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 goldenrod	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 N U N
heartleaf Alexanders	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
Macoun's buttercup	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
marsh fleabane	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
marsh skullcap	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
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
meadow anemone	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 U U
New England 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
nodding beggartick	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
northern water plantain	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
prairie ironweed	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
rough bugleweed	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
silverweed 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
spotted water hemlock	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
water smartweed	N N N N	N N N N	N N N N	N N N N	N N N N	N N N N	N N N N
western 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
white panicle 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
wild mint	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
wild strawberry	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
<b>Shrubs and Trees</b>							
false indigo	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 N
meadow 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
Missouri River 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
sandbar 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

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

<sup>†</sup> 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 ES 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)
Prairie Cordgrass/Reedgrass/Sedge (1.1):	6,000	1.65
Sedge/Rush/Prairie Cordgrass/Reed Canarygrass (1.2):	5,000	1.37
Reed Canarygrass/Spikerush/Bluegrass (2.1):	4,000	1.09
Annual/Pioneer Perennial (2.2):	2,000	0.55

\*Based on 912 lbs./acre (air-dry weight) per Animal Unit Month (AUM), and on 25 percent harvest efficiency (refer to United States Department of Agriculture (USDA) Natural Resources Conservation Service (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 C. Infiltration is very slow and runoff potential for this site is negligible. In many cases, areas with greater than 75 percent ground cover have the greatest potential for high infiltration and lower runoff. 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 esthetic value that appeals to visitors.

## Wood Products

No appreciable wood products are typically present on this site.

## Other Products

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

## Supporting Information

### Associated Sites

Subirrigated (R053CY003SD), Shallow Marsh (R053CY001SD), Wet Meadow (R053CY004SD)

### Similar Sites

(R053CY001SD) – Shallow Marsh [less prairie cordgrass whitetop dominant; 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: Stan Boltz, Range Management Specialist (RMS), NRCS; Shane Deranleau, RMS, NRCS; and Mitch Faulkner, RMS, NRCS.

### State Correlation

This site has been correlated in SD in MLRA 53C.

### Field Offices/Counties

Chamberlain	Brule/Buffalo	Huron	Beadle	Plankinton	Aurora
Faulkton	Faulk	Miller	Hand	Selby	Walworth
Gettysburg	Potter	Onida	Sully	Wessington Springs	Jerauld
Highmore	Hyde	Pierre	Hughes		

### Relationship to Other Established Classifications

Level IV Ecoregions of the Conterminous United States: 42a – Missouri Coteau, 42e – Southern Missouri Coteau, 42f – Southern Missouri Coteau Slope.

### 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://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

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Date