

United States Department of Agriculture Natural Resources Conservation Service

Ecological Site Description

Site Type: Rangeland

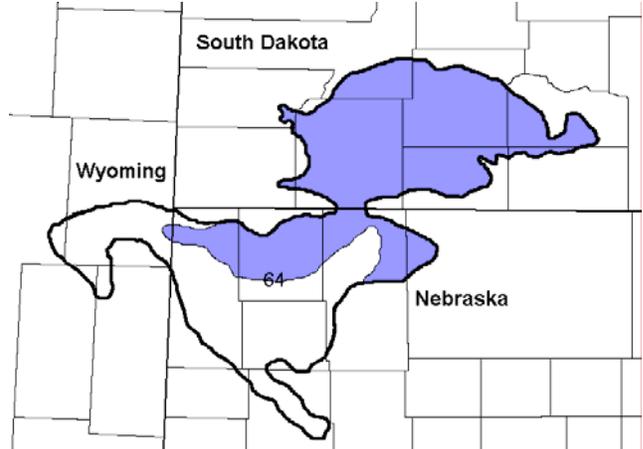
Site Name: Sandy 17-20" P.Z.

Site ID: R064XY032NE

Major Land Resource Area: 64 – Mixed Sandy and Silty Tableland

Physiographic Features

This site occurs on nearly level to steeply sloping hillslopes, terraces and alluvial fans.



Landform: hill, stream terrace, alluvial fan

Aspect: N/A

	<u>Minimum</u>	<u>Maximum</u>
Elevation (feet):	2900	4000
Slope (percent):	0	30
Water Table Depth (inches):	80	80
Flooding:		
Frequency:	None	None
Duration:	None	None
Ponding:		
Depth (inches):	None	None
Frequency:	None	None
Duration:	None	None
Runoff Class:	Negligible	Low

Climatic Features

MLRA 64 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 17 to 20 inches per year. The normal average annual temperature is about 47° F. January is the coldest month with average temperatures ranging from about 21° F (Wood, SD) to about 25° F (Hemingford, NE). July is the warmest month with temperatures averaging from about 72° F (Hemingford, NE) to about 76° F (Wood, SD). The range of normal average monthly temperatures between the coldest and warmest months is about 55° 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.

	<u>Minimum</u>	<u>Maximum</u>
Frost-free period (days):	138	143
Freeze-free period (days):	161	163
Mean Annual Precipitation (inches):	17	20

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

	Precip. Min.	Precip. Max	Temp. Min.	Temp. Max.
January	0.42	0.46	9.0	35.8
February	0.48	0.61	14.6	40.7
March	1.00	1.22	21.9	47.5
April	1.95	2.15	32.4	61.3
May	3.26	3.38	42.6	72.2
June	2.89	3.27	52.0	82.1
July	2.38	2.73	58.2	90.1
August	1.59	1.96	56.3	89.3
September	1.33	1.58	46.6	79.5
October	1.02	1.38	35.6	66.6
November	0.56	0.65	24.0	49.0
December	0.42	0.50	14.0	38.4

Climate Stations		Period	
Station ID	Location or Name	From	To
NE3755	Hemingford, NE	1964	1999
SD9442	Wood, SD	1948	1999

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

Riparian and Wetland Features

No riparian areas or wetland features are directly associated with this site.

Representative Soil Features

The features common to soils in this site are the loamy very fine sand to very fine sandy loam textured surface layers and slopes of 0 to 30 percent. The soils in this site are well to somewhat excessively drained and formed in eolian deposits, alluvium, colluvium or residuum. The surface layer is 3 to 30 inches thick. The texture of the subsurface generally ranges from loam to fine sand. This site should show slight to no evidence of rills, wind scoured areas or pedestalled plants. Water flow paths are broken, irregular in appearance or discontinuous with numerous debris dams or vegetative barriers. The soil surface is stable and intact. Sub-surface soil layers are not restrictive to water movement and root penetration.

These soils are susceptible to wind and water erosion. The hazard of water erosion increases on slopes greater than about 15 percent. Loss of 50 percent or more of the surface layer of the soils 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: eolian deposits, alluvium, colluvium, residuum
Parent Material Origin: sandstone, non-calcareous, and sedimentary, unspecified
Surface Texture: fine sandy loam, very fine sandy loam, loamy very fine sand
Surface Texture Modifier: none
Subsurface Texture Group: sandy
Surface Fragments $\leq 3''$ (% Cover): 0
Surface Fragments $> 3''$ (%Cover): 0
Subsurface Fragments $\leq 3''$ (% Volume): 0
Subsurface Fragments $> 3''$ (% Volume): 10

	<u>Minimum</u>	<u>Maximum</u>
Drainage Class:	well	somewhat excessively
Permeability Class:	moderate	rapid
Depth (inches):	20	80
Electrical Conductivity (mmhos/cm)*:	0	2
Sodium Absorption Ratio*:	0	9
Soil Reaction (1:1 Water)*:	5.6	8.4
Soil Reaction (0.1M CaCl₂)*:	NA	NA
Available Water Capacity (inches)*:	3	7
Calcium Carbonate Equivalent (percent)*:	0	10

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

Plant Communities

Ecological Dynamics of the Site:

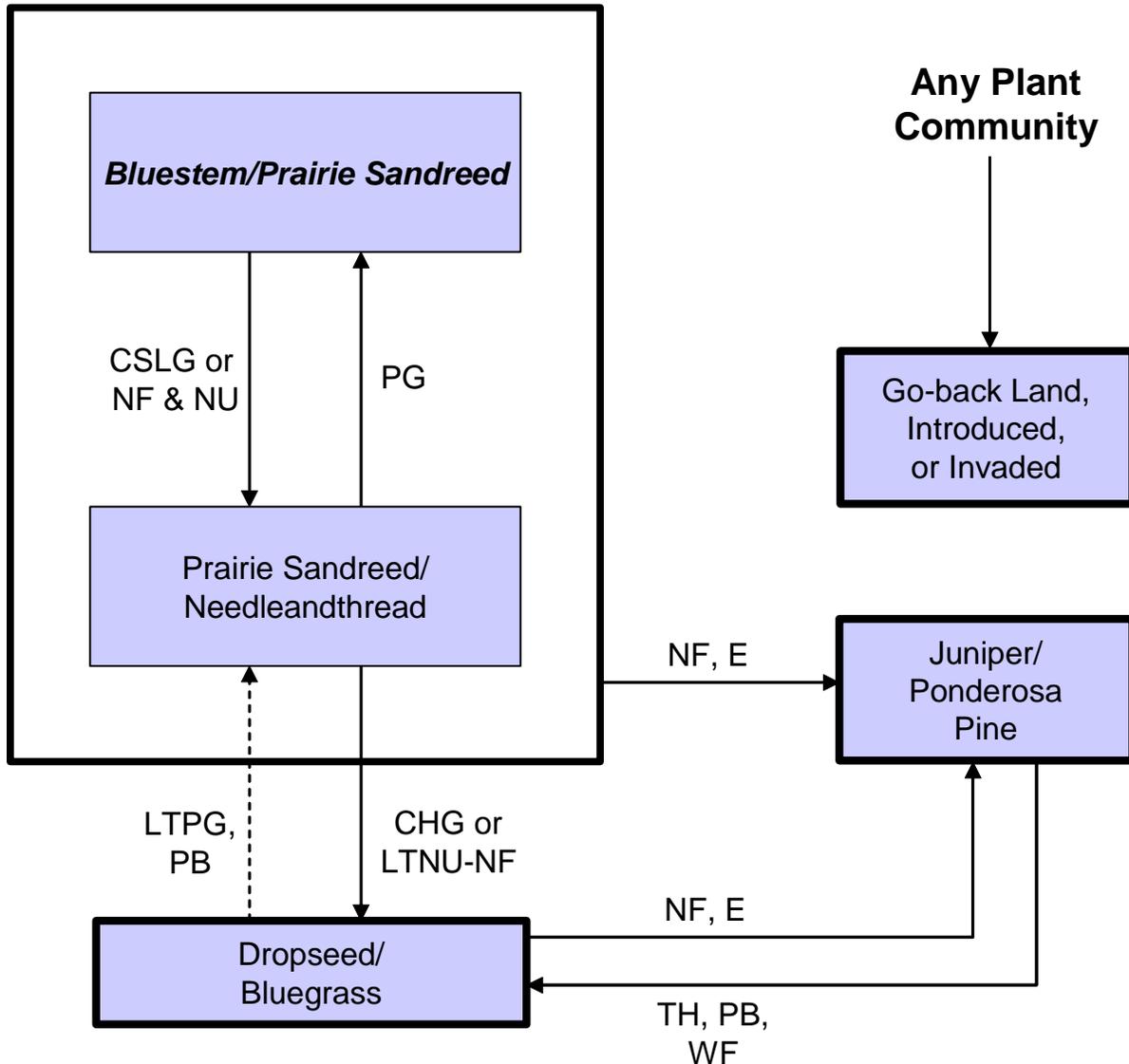
This site developed under Northern Great Plains climatic conditions, light to severe grazing by bison and other large herbivores, sporadic natural or man-caused wildfire (often of light intensities), and other biotic and abiotic factors that typically influence soil/site development. Changes will occur 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. Natural fire played a significant role in the maintenance of this site by limiting conifer establishment. The recent control of fire and the increased seed source from shelterbelts result in occasional juniper and/or ponderosa pine encroachment.

Continuous season-long grazing (during the typical growing season of May through October) and/or repeated seasonal grazing (e.g., every spring, every summer) without adequate recovery periods following each grazing occurrence causes this site to depart from the Bluestem/Prairie Sandreed Plant Community. Species such as western wheatgrass, prairie sandreed, needleandthread, prairie junegrass, Scribner's panicum, and sedges will increase. Continued deterioration results in a community dominated by bluegrass, cheatgrass, Scribner's panicum, sand dropseed, and western ragweed. Warm season grasses such as sand bluestem, big bluestem, little bluestem, and eventually prairie sandreed will decrease in frequency and production.

Interpretations are primarily based on the Bluestem/Prairie Sandreed Plant Community. It 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 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 will be discussed in more detail in the plant community descriptions following the diagram.

Plant Communities and Transitional Pathways



CHG-Continuous heavy grazing (heavy levels of grazing of a unit during most or all of the growing season); **CSLG**-Continuous season-long grazing (grazing a unit for an entire growing season); **E**-Encroachment; **LTPG**-Long term prescribed grazing; **NF**-No fire; **NU**-Non use; **PB**-Prescribed burning; **PG**-Prescribed grazing (planned, controlled harvest of vegetation with grazing or browsing animals – see FOTG, Section IV, 528); **TH**-Timber harvest; **WF**-Wildfire.

Plant Community Composition and Group Annual Production

COMMON/GROUP NAME	SYMBOL	Bluestem/Prairie Sandreed			Prairie Sandreed/ Needleandthread			Dropseed/Bluegrass			Juniper/Ponderosa Pine		
		Grp	lbs./acre	% Comp	Grp	lbs./acre	% Comp	Grp	lbs./acre	% Comp	Grp	lbs./acre	% Comp
GRASSES & GRASS-LIKES			1920 - 2160	80 - 90		1600 - 1900	80 - 95		980 - 1260	70 - 90		540 - 720	60 - 80
BLUESTEM		1	240 - 720	10 - 30	1	40 - 200	2 - 10	1	0 - 28	0 - 2	1	0 - 45	0 - 5
sand bluestem	ANHA	1	240 - 720	10 - 30	1	40 - 200	2 - 10	1	0 - 28	0 - 2	1	0 - 45	0 - 5
big bluestem	ANGE	1	240 - 720	10 - 30	1	40 - 200	2 - 10	1	0 - 28	0 - 2	1	0 - 45	0 - 5
		2	240 - 720	10 - 30	2	400 - 800	20 - 40	2	28 - 140	2 - 10	2	45 - 90	5 - 10
prairie sandreed	CALO	2	240 - 720	10 - 30	2	300 - 700	15 - 35	2	28 - 140	2 - 10	2	0 - 18	0 - 2
little bluestem	SCSC	2	240 - 720	10 - 30	2	40 - 200	2 - 10	2	0 - 28	0 - 2	2	45 - 90	5 - 10
NEEDLEGRASSES		3	360 - 600	15 - 25	3	300 - 600	15 - 30	3	28 - 70	2 - 5	3	90 - 180	10 - 20
needleandthread	HECOC8	3	360 - 600	15 - 25	3	300 - 600	15 - 30	3	28 - 70	2 - 5	3	90 - 135	10 - 15
green needlegrass	NAVI4	3	0 - 120	0 - 5	3	0 - 100	0 - 5				3	45 - 90	5 - 10
GRAMA		4	120 - 360	5 - 15	4	100 - 400	5 - 20	4	70 - 350	5 - 25	4	45 - 90	5 - 10
hairy grama	BOHI2	4	0 - 120	0 - 5	4	0 - 100	0 - 5	4	0 - 70	0 - 5	4	45 - 90	5 - 10
blue grama	BOGR2	4	120 - 360	5 - 15	4	100 - 400	5 - 20	4	70 - 350	5 - 25	4	45 - 90	5 - 10
NATIVE GRASSES/GRASS-LIKES		5	240 - 600	10 - 25	5	300 - 600	15 - 30	5	350 - 630	25 - 45	5	45 - 225	5 - 25
Scribner panicum	DIOLS	5	24 - 120	1 - 5	5	100 - 200	5 - 10	5	140 - 280	10 - 20	5	0 - 9	0 - 1
switchgrass	PAV2	5	120 - 240	5 - 10	5	0 - 100	0 - 5	5	0 - 28	0 - 2	5	0 - 45	0 - 5
sand dropseed	SPCR	5	24 - 120	1 - 5	5	40 - 200	2 - 10	5	140 - 420	10 - 30	5	18 - 90	2 - 10
sideoats grama	BOCU	5	48 - 168	2 - 7	5	0 - 40	0 - 2	5	0 - 28	0 - 2	5	9 - 45	1 - 5
prairie junegrass	KOMA	5	24 - 72	1 - 3	5	20 - 100	1 - 5	5	70 - 140	5 - 10	5	9 - 45	1 - 5
sedge	CAREX	5	24 - 72	1 - 3	5	100 - 200	5 - 10	5	70 - 210	5 - 15	5	18 - 72	2 - 8
western wheatgrass	PASM	5	120 - 240	5 - 10	5	100 - 300	5 - 15	5	0 - 140	0 - 10	5	18 - 90	2 - 10
sixweeks fescue	VUOC							5	14 - 42	1 - 3	5	9 - 18	1 - 2
Canada wildrye	ELCA4										5	0 - 45	0 - 5
other perennial grasses	ZGP	5	24 - 72	1 - 3	5	20 - 60	1 - 3	5	0 - 28	0 - 2	5	0 - 45	0 - 5
NON-NATIVE GRASSES		6			6			6	140 - 420	10 - 30	6	9 - 90	1 - 10
cheatgrass	BRTE							6	0 - 70	0 - 5	6	0 - 45	0 - 5
bluegrass	POA							6	140 - 420	10 - 30	6	9 - 45	1 - 5
FORBS		7	120 - 240	5 - 10	7	20 - 200	1 - 10	7	70 - 280	5 - 20	7	45 - 90	5 - 10
annual eriogonum	ERAN4	7	24 - 48	1 - 2	7	20 - 40	1 - 2	7	14 - 28	1 - 2	7	0 - 18	0 - 2
annual sunflower	HEAN3	7	0 - 24	0 - 1	7	0 - 20	0 - 1	7	0 - 28	0 - 2	7	0 - 9	0 - 1
bush morningglory	IFLE	7	24 - 48	1 - 2	7	20 - 60	1 - 3	7	0 - 28	0 - 2			
common mullein	VETH				7	0 - 20	0 - 1	7	0 - 28	0 - 2	7	9 - 18	1 - 2
cudweed sagewort	ARLU	7	24 - 48	1 - 2	7	20 - 60	1 - 3	7	14 - 42	1 - 3	7	0 - 9	0 - 1
false boneset	BREU	7	0 - 24	0 - 1	7	0 - 20	0 - 1				7	0 - 9	0 - 1
gayfeather	LIATR	7	0 - 24	0 - 1	7	0 - 20	0 - 1	7	0 - 14	0 - 1	7	0 - 9	0 - 1
goldenrod	SOLID	7	0 - 24	0 - 1	7	0 - 20	0 - 1	7	0 - 14	0 - 1	7	9 - 27	1 - 3
green sagewort	ARDR4	7	0 - 24	0 - 1	7	20 - 100	1 - 5	7	28 - 210	2 - 15	7	9 - 27	1 - 3
hairy goldaster	HEV14	7	0 - 24	0 - 1	7	20 - 40	1 - 2	7	14 - 42	1 - 3			
heath aster	SYER	7	0 - 24	0 - 1	7	20 - 40	1 - 2	7	14 - 42	1 - 3	7	9 - 18	1 - 2
hoary puccoon	LICA12	7	0 - 24	0 - 1	7	0 - 20	0 - 1	7	0 - 14	0 - 1			
lupine	LUPIN	7	24 - 48	1 - 2	7	20 - 40	1 - 2	7	14 - 28	1 - 2	7	0 - 18	0 - 2
penstemon	PENST	7	0 - 24	0 - 1	7	0 - 20	0 - 1	7	0 - 14	0 - 1	7	0 - 9	0 - 1
prairie clover	DALEA	7	0 - 24	0 - 1	7	0 - 20	0 - 1				7	0 - 9	0 - 1
prairie coneflower	RACO3	7	24 - 48	1 - 2	7	20 - 40	1 - 2	7	0 - 14	0 - 1	7	9 - 18	1 - 2
purple coneflower	ECA2	7	0 - 24	0 - 1	7	0 - 20	0 - 1	7	0 - 14	0 - 1	7	0 - 9	0 - 1
pussytoes	ANTEN	7	0 - 24	0 - 1	7	0 - 20	0 - 1	7	0 - 28	0 - 2	7	0 - 27	0 - 3
Rocky Mountain beeplant	CLSE							7	0 - 14	0 - 1			
rush skeletonweed	LYJU	7	0 - 24	0 - 1	7	0 - 20	0 - 1	7	0 - 28	0 - 2	7	0 - 9	0 - 1
scarlet globemallow	SPCO	7	0 - 24	0 - 1	7	0 - 20	0 - 1	7	0 - 14	0 - 1	7	0 - 9	0 - 1
scurfspea	PSORA2	7	24 - 72	1 - 3	7	20 - 60	1 - 3	7	0 - 14	0 - 1	7	0 - 9	0 - 1
spiderwort	TRADE	7	0 - 24	0 - 1	7	0 - 20	0 - 1	7	0 - 14	0 - 1	7	0 - 18	0 - 2
stiff sunflower	HEPA19	7	0 - 24	0 - 1	7	0 - 20	0 - 1						
sweetclover	MELIL				7	0 - 20	0 - 1	7	0 - 42	0 - 3	7	0 - 9	0 - 1
Texas croton	CRTE4	7	0 - 24	0 - 1	7	0 - 20	0 - 1	7	0 - 14	0 - 1			
thistle	CIRSI				7	0 - 20	0 - 1	7	0 - 28	0 - 2	7	0 - 18	0 - 2
verbena	VERBE	7	0 - 24	0 - 1	7	0 - 20	0 - 1	7	14 - 42	1 - 3	7	9 - 27	1 - 3
western ragweed	AMPS	7	0 - 48	0 - 2	7	40 - 100	2 - 5	7	70 - 210	5 - 15	7	0 - 18	0 - 2
other perennial forbs	2FP	7	0 - 48	0 - 2	7	0 - 40	0 - 2	7	0 - 28	0 - 2	7	0 - 27	0 - 3
other annual forbs	2FA	7	0 - 24	0 - 1	7	0 - 20	0 - 1	7	0 - 70	0 - 5	7	0 - 45	0 - 5
SHRUBS		8	48 - 240	2 - 10	8	20 - 200	1 - 10	8	14 - 140	1 - 10	8	45 - 180	5 - 20
broom snakeweed	GUSA2							8	0 - 28	0 - 2	8	0 - 9	0 - 1
cactus	OPUNT	8	0 - 48	0 - 2	8	0 - 40	0 - 2	8	14 - 70	1 - 5	8	9 - 27	1 - 3
currant	RIBES										8	0 - 27	0 - 3
fringed sagewort	ARFR4	8	0 - 48	0 - 2	8	0 - 40	0 - 2	8	0 - 70	0 - 5	8	0 - 27	0 - 3
leadplant	AMCA6	8	24 - 168	1 - 7	8	20 - 100	1 - 5	8	0 - 28	0 - 2	8	9 - 45	1 - 5
poison ivy	TORY										8	18 - 45	2 - 5
rose	ROSA5	8	24 - 120	1 - 5	8	20 - 100	1 - 5	8	0 - 28	0 - 2	8	9 - 45	1 - 5
skunkbush sumac	RHTR										8	9 - 63	1 - 7
small soapweed	YUGL	8	24 - 48	1 - 2	8	20 - 40	1 - 2	8	14 - 42	1 - 3	8	0 - 27	0 - 3
western sandcherry	PRPUB	8	0 - 24	0 - 1							8	0 - 9	0 - 1
other shrubs	2SHRUB	8	0 - 48	0 - 2	8	0 - 40	0 - 2	8	0 - 28	0 - 2	8	0 - 45	0 - 5
TREES		9	0 - 120	0 - 5	9	0 - 100	0 - 5	9	0 - 70	0 - 5	9	45 - 135	5 - 15
ponderosa pine	PIPO	9	0 - 120	0 - 5	9	0 - 100	0 - 5	9	0 - 70	0 - 5	9	45 - 135	5 - 15
juniper	JUNIP	9	0 - 24	0 - 1	9	0 - 20	0 - 1	9	0 - 14	0 - 1	9	45 - 135	5 - 15
Annual Production lbs./acre			LOW RV HIGH		LOW RV HIGH		LOW RV HIGH		LOW RV HIGH		LOW RV HIGH		LOW RV HIGH
GRASSES & GRASS-LIKES			1640 - 2016 - 2375		1470 - 1730 - 1985		825 - 1113 - 1280		380 - 630 - 1080				
FORBS			115 - 180 - 250		15 - 110 - 205		65 - 175 - 300		40 - 68 - 95				
SHRUBS			45 - 144 - 250		15 - 110 - 205		10 - 77 - 145		40 - 113 - 185				
TREES			0 - 60 - 125		0 - 50 - 105		0 - 35 - 75		40 - 90 - 140				
TOTAL			1800 - 2400 - 3000		1500 - 2000 - 2500		900 - 1400 - 1800		500 - 900 - 1500				

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 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 data are 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”. According to the USDA NRCS National Range and Pasture Handbook, Desired Plant Communities (DPC’s) will be determined by the decision-makers and will meet minimum quality criteria established by the NRCS. The main purpose for including any description of a plant community here is to capture the current knowledge and experience at the time of this revision.

Bluestem/Prairie Sandreed Plant Community

Interpretations are based primarily on the Bluestem/Prairie Sandreed Plant Community (this is also considered to be climax). The community evolved with grazing by large herbivores and occasional fire and can be found on areas that are properly managed. The potential vegetation is about 80% grasses or grass-like plants, 10% forbs, and 10% shrubs. Warm-season mid and tall grasses dominate the plant community.

Principal grasses are sand bluestem, big bluestem, prairie sandreed and little bluestem. Dominant cool season grasses include needleandthread and western wheatgrass. Grama and sedge occur as an understory. Forbs and shrubs are not abundant but are present. The diversity in plant species allows for high drought tolerance. This is a sustainable plant community in terms of site/soil stability, watershed function, and biologic integrity.

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

Growth curve number: NE6405

Growth curve name: Pine Ridge/Badlands, warm-season dominant.

Growth curve description: Warm-season dominant.

JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
0	0	3	7	15	20	30	15	5	5	0	0

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

- Continuous season-long grazing, or non-use and no fire will convert the plant community to the *Prairie Sandreed/Needleandthread Plant Community*.
- No fire and encroachment from adjacent communities can convert this plant community to the *Juniper/Ponderosa Pine Plant Community*.

Prairie Sandreed/Needleandthread Plant Community

This plant community is resilient and develops from continuous season-long grazing. The more palatable bluestems have decreased while prairie sandreed, western wheatgrass, and needleandthread have increased. Forbs and shrubs do not change significantly in composition compared to the Bluestem/Prairie Sandreed Plant Community. This plant community maintains diversity, but production levels are lower.

With non-use by herbivores and no fire, litter can accumulate and the production will eventually be reduced. Initially, the composition will not change. However, with long term non-use and no fire, this plant community can deteriorate and be susceptible to non-native plant invasion.

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

Growth curve number: NE6404

Growth curve name: Pine Ridge/Badlands, warm-season dominant, cool-season sub-dominant.

Growth curve description: Warm-season dominant, cool-season sub-dominant.

JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
0	0	5	8	15	24	23	15	5	5	0	0

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

- Continuous heavy grazing, or long-term non-use and no fire will convert the plant community to the *Dropseed/Bluegrass Plant Community*.
- No fire and encroachment from adjacent communities can convert this plant community to the *Juniper/Ponderosa Pine Plant Community*.
- Prescribed grazing will convert the plant community to the *Bluestem/Prairie Sandreed Plant Community*.

Dropseed/Bluegrass Plant Community

This plant community developed under continuous heavy grazing over a period of years, or from long-term non-use by herbivores and no fire. The grasses in this plant community consist of sand dropseed, bluegrass, Scribners panicum, sedge and blue grama. Green sagewort, western ragweed and other less palatable forbs will begin to increase in this plant community, especially with above average precipitation. Native annuals and non-native species such as sixweeks fescue and annual brome will begin to increase and/or invade on this plant community.

Prairie sandreed and needleandthread can still be found, but in lesser amounts. If these remnants are virtually eliminated through excessive disturbance, it may become difficult to return to the *Prairie Sandreed/Needleandthread Plant Community*.

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

Growth curve number: NE6403

Growth curve name: Pine Ridge/Badlands, cool-season/warm-season co-dominant.

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

JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
0	0	5	10	20	25	20	10	5	5	0	0

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

- Long-term prescribed grazing will lead this plant community through successional stages, and may eventually move this plant community to the *Prairie Sandreed/Needleandthread Plant Community*. This pathway will be effective only if the remnant native species are present.
- Prescribed burning, followed by long-term prescribed grazing will lead this plant community through successional stages, and may eventually move this plant community to the *Prairie Sandreed/Needleandthread Plant Community*. This pathway will be effective only if the remnant native species are present.

Juniper/Ponderosa Pine Plant Community

Historically, ponderosa pine and juniper were confined to ridges and steep shallow slopes located adjacent to this ecological site. Ponderosa pine and juniper are expanding on to this ecological site due to the suppression of fire, and the available seed source from wildlife plantings and shelterbelts. Juniper/pine canopy cover consists of more than 10% of mature trees, but total canopy cover can be considerably higher. The understory production is made up of about 70% grass and grass-like species, 10% forbs and 20% shrubs. Dominant grasses include needleandthread, blue grama, sand dropseed and western wheatgrass. Some grasses of secondary importance include Canada wildrye and threadleaf sedge.

This plant community can be changed easily in the early stages of encroachment. The invading trees can be removed with a prescribed fire followed by prescribed grazing. If the encroachment is allowed to continue without managing the invading trees, and the mature tree canopy cover becomes high enough, the plant community will become resistant to change. The herbaceous vegetation in the understory is capable of enduring fire; however, very hot crown fires will have a detrimental effect to the plant community. Reclamation of juniper/pine dominated areas can be costly and prove to be temporary without proper management (i.e. prescribed burning and prescribed grazing).

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

Growth curve number: NE6411

Growth curve name: Pine Ridge/Badlands, heavy conifer canopy.

Growth curve description: Mature ponderosa pine/juniper overstory.

JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1	3	7	10	20	28	15	5	4	4	2	1

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

- Prescribed burning, timber harvest or hot crown wildfires may lead this plant community through successional stages, and may eventually move this plant community to the *Bluestem/Prairie Sandreed Plant Community*. This pathway will be effective only if the remnant native species are present.

Go-back Land, Introduced, or Invaded

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

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

The **Introduced** state is normally those areas seeded to crested wheatgrass, pubescent, intermediate wheatgrass and alfalfa, or other introduced species. It may require considerable investment. Refer to the associated Forage Suitability Group description for adapted species.

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

Ecological Site Interpretations

Animal Community – Wildlife Interpretations

-- Under Development --

Bluestem/Prairie Sandreed Plant Community:

Prairie Sandreed/Needleandthread Plant Community:

Dropseed/Bluegrass Plant Community:

Juniper/Ponderosa Pine Plant Community:

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

Common Name	Cattle	Sheep	Horses	Deer	Antelope	Bison	Elk
Grasses and Grass-likes							
big bluestem	U D P D	U D U 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 U	D P P D	U D P U	D P P D	D P P D	U D P U	U D P 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
hairy grama	U D P U	D P P D	U D P U	D P P D	D P P D	U D P U	U D P U
little bluestem	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
needleandthread	U D U D	N D N U	U D U D	N D N U	N D N U	U D U D	U D U D
prairie junegrass	U D U D	N D N U	U D U D	N D N U	N D N U	U D U D	U D U D
prairie sandreed	U D D U	U D U U	U D D U	U D U U	U D U U	U D D U	U D D U
sand bluestem	U D P D	U D U U	U D P D	U D U U	U D U U	U D P D	U D P D
sand 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
Scribner panicum	U U D U	N U N N	U U D U	N U N N	N U N N	U U D U	U U D U
sedge	U 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
sideoats grama	U D P U	U P D U	U D P U	U P D U	U P D U	U D P U	U D P 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
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							
annual eriogonum	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
annual sunflower	U U D U	U D U U	U U D U	U D U U	U D U U	U U D U	U D U U
bush morningglory	U D P U	U D D U	U D P U	U D D U	U D D U	U D P U	U D D 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
gayfeather	U U D U	U P P U	U U D U	U P P U	U P P U	U U D U	U P P U
goldenrod	U U D U	N U U N	U U D U	N U U N	N U U N	U U D U	N U U N
green sagewort	U U U U	U U U U	U U U U	U U U U	U U U U	U U U U	U U U U
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
hoary puccoon	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
lupine	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
penstemon	U U U U	U P P U	U U U U	U P P U	U P P U	U U U U	U P P U
prairie 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
prairie coneflower	U U D U	U P P U	U U D U	U P P U	U P P U	U U D U	U P P U
purple coneflower	U U D U	U P P U	U U D U	U P P U	U P P U	U U D U	U P P U
pussytoes	U U U U	U U U U	U U U U	U U U U	U U U U	U U U U	U U U U
rush skeletonweed	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
scarlet globemallow	U U D U	U D D U	U U D U	U D D U	U D D U	U U D U	U D D U
scurfpea	U U U U	N U U N	U U U U	N U U N	N U U N	U U U U	N U U N
spiderwort	U U U U	N N N N	U U U U	N N N N	N N N N	U U U U	N N N N
stiff 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
Texas croton	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
verbena	U U D U	U U U U	U U D U	U U U U	U U U U	U U D U	U U U U
western ragweed	U U U U	N N N N	U U U U	N N N N	N N N N	U U U U	N N N N
Shrubs							
cactus	N N N N	N N N N	N N N N	N N N N	N N N N	N N N N	N N N N
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
small soapweed	D N N D	D U U D	D N N D	D U U D	D U U D	D N N D	D U U D
western sandcherry	D P P D	D U U D	D P P D	P U D P	D U U D	D P P D	P U U P
Trees							
ponderosa pine	U T T U	U N N U	U N N U	U N N U	U N N U	U T T U	U N N U
juniper	U N N U	U N N U	U N N U	D U U D	U N N U	U N N U	U N N U

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

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

Animal Community – Grazing Interpretations

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

Plant Community	Average Annual Production (lbs./acre, air-dry)	Stocking Rate* (AUM/acre)
Bluestem/Prairie Sandreed	2400	0.76
Prairie Sandreed/Needleandthread	2000	0.63
Dropseed/Bluegrass	1400	0.44
Juniper/Ponderosa Pine	900	**

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

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

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

Hydrology Functions

Water is the principal factor limiting forage production on well drained portions of this site. Normal rainfall is limited to 17-22 inches per year. Soils on this site are in Hydrologic Soil Group A and B. Some areas have high water tables. On well drained portions of this site, infiltration potential is high. On well drained areas, significant runoff is expected to occur only during intense storms (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 variety of plants that bloom from spring until fall have an esthetic value that appeals to visitors.

Wood Products

Timber harvest of juniper and ponderosa pine may occur on localized areas of this site.

Other Products

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

Supporting Information

Associated Sites

(064XY012NE) – Sands

(064XY040NE) – Shallow

(064XY036NE) – Loamy 17-20" P.Z.

(064XY024NE) – Subirrigated

Similar Sites

(064XY036NE) – Loamy 17-20" P.Z. [less bluestem; more western wheatgrass]

(064XY012NE) – Sands [more sand bluestem; no western wheatgrass; less blue grama]

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, NRCS; Jill Epley, Range Management Specialist, NRCS; Rick Peterson, Range Management Specialist, NRCS; David Steffen, Range Management Specialist, NRCS; Jeff Vander Wilt, Range Management Specialist, NRCS; Phil Young, Soil Scientist, NRCS.

<u>Data Source</u>	<u>Number of Records</u>	<u>Sample Period</u>	<u>State</u>	<u>County</u>
SCS-RANGE-417	5	1968 – 1974	NE, SD	Dawes, Sheridan, Mellette

State Correlation

This site has been correlated with Nebraska, South Dakota and Wyoming in MLRA 64.

Field Offices

Chadron, NE	Dawes/Sioux	Lusk, WY	Niobrara	Rushville, NE	Sheridan
Custer, SD	Custer	Martin, SD	Bennett/Shannon	Valentine, NE	Cherry
Hot Springs, SD	Fall River	Pine Ridge, SD	Pine Ridge IR	Wall, SD	East Pennington
Kadoka, SD	Jackson	Rosebud, SD	Rosebud IR	White River, SD	Mellette/Todd

Relationship to Other Established Classifications

Level IV Ecoregions of the Conterminous United States: 25a – Pine Ridge Escarpment, 43h – White River Badlands, and 43i – Keya Paha Tablelands.

Other References

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

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

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

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

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

USDA, NRCS, Various Published Soil Surveys.

Site Description Approval

NE, State Range Management Specialist	Date	SD, State Range Management Specialist	Date
---------------------------------------	------	---------------------------------------	------

WY, State Range Management Specialist	Date
---------------------------------------	------