

## United States Department of Agriculture Natural Resources Conservation Service

### Ecological Site Description

**Site Type:** Rangeland

**Site Name:** Sandy 22-25" P.Z.

**Site ID:** R066XY054NE

**Major Land Resource Area (MLRA):**  
66 – Dakota - Nebraska Eroded Tableland



### Physiographic Features

This site occurs on tablelands, ancient high terraces, interdunes of uplands and on the sides of valleys.

**Landform:** plain, hill, interdune, valley side

**Aspect:** N/A

	<u>Minimum</u>	<u>Maximum</u>
<b>Elevation (feet):</b>	1900	3000
<b>Slope (percent):</b>	0	15
<b>Water Table Depth (inches):</b>	80	80
<b>Flooding:</b>		
<b>Frequency:</b>	None	None
<b>Duration:</b>	None	None
<b>Ponding:</b>		
<b>Depth (inches):</b>	None	None
<b>Frequency:</b>	None	None
<b>Duration:</b>	None	None
<b>Runoff Class:</b>	Negligible	Medium

### Climatic Features

MLRA 66 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 the winds move freely across the plains and account for rapid changes in temperature.

Annual precipitation ranges from 22 to 25 inches per year. The normal average annual temperature is about 48°F. January is the coldest month with average temperatures ranging from about 19°F (Bonesteel, South Dakota (SD)), to about 23°F (Ainsworth, Nebraska (NE)). July is the warmest month with temperatures averaging from about 74°F (Lynch, NE), to about 75°F (Gregory, SD). The range of normal average monthly temperatures between the coldest and warmest months is about 54°F. This large annual range attests to the continental nature of this area's climate. Hourly winds average about 10 miles per hour annually, ranging from about 11 miles per hour during the spring to about 9 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 native cool-season plants begins mid to late March and continues to late June. Native warm-season plants begin growth in early May and continue to late August. 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):	147	154
Freeze-free period (days):	172	173
Mean Annual Precipitation (inches):	22	25

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

	Precip. Min.	Precip. Max	Temp. Min.	Temp. Max.
January	0.35	0.42	7.9	31.3
February	0.63	0.69	13.6	37.2
March	1.23	1.58	22.3	46.5
April	2.26	3.03	34.7	61.2
May	3.38	4.20	46.2	72.5
June	3.67	3.74	56.0	82.2
July	3.17	3.25	62.2	88.3
August	2.65	2.68	59.9	86.8
September	2.30	2.71	49.4	77.3
October	1.34	1.79	37.1	65.0
November	0.82	0.94	23.3	47.1
December	0.38	0.45	13.2	35.1

Climate Stations		Period	
Station ID	Location or Name	From	To
NE0050	Ainsworth	1948	2003
SD0778	Bonesteel	1956	2003
NE1365	Butte	1948	2003

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

**Influencing Water Features**

No significant water features influence this site.

**Representative Soil Features**

The features common to all soils in this site are the loam to fine sand textured surface layers and slopes of 0 to 15 percent. The soils in this site are from well drained to excessively drained. They formed primarily in eolian deposits, sandy and gravelly alluvium, and material weathered from petrocalcic horizons. Pivot soils are formed in sandy and gravelly alluvium. O'Neill soils formed in loamy material over sandy and gravelly alluvium. Anselmo soils formed in mixed loamy and sandy eolian material. Dunday soils formed in eolian sands. Brunswick, Duda, Holt, and Ronson soils formed in material weathered from petrocalcic horizons. McKelvie soils formed in eolian sands and sandy material weathered from petrocalcic horizons. The surface layer is 3 to 19 inches thick. The texture of the control section 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. Subsurface soil layers are not restrictive to water movement and root penetration.

These soils are mainly susceptible to water erosion. The hazard of water erosion increases on slopes greater than about 10 percent.

More information can be found in the various soil survey reports. Contact the local United States Department of Agriculture (USDA) service center for soil survey reports that include more detail specific to your location.

**Parent Material Kind:** eolian deposits, alluvium, material weathered from petrocalcic horizons

**Parent Material Origin:** mixed

**Surface Texture:** fine sandy loam, loamy fine sand, sandy loam

**Surface Texture Modifier:** none

**Subsurface Texture Group:** sandy

**Surface Fragments  $\leq 3''$  (% Cover):** 0-10

**Surface Fragments  $> 3''$  (%Cover):** 0

**Subsurface Fragments  $\leq 3''$  (% Volume):** 0-55

**Subsurface Fragments  $> 3''$  (% Volume):** 0-10

	<u>Minimum</u>	<u>Maximum</u>
<b>Drainage Class:</b>	well	excessively
<b>Permeability Class:</b>	moderate	rapid
<b>Depth (inches):</b>	20	80
<b>Electrical Conductivity (mmhos/cm)*:</b>	0	4
<b>Sodium Absorption Ratio*:</b>	0	5
<b>Soil Reaction (1:1 Water)*:</b>	5.1	8.4
<b>Soil Reaction (0.1M CaCl<sub>2</sub>)*:</b>	NA	NA
<b>Available Water Capacity (inches)*:</b>	3	6
<b>Calcium Carbonate Equivalent (percent)*:</b>	0	5

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

## Plant Communities

### Ecological Dynamics of the Site:

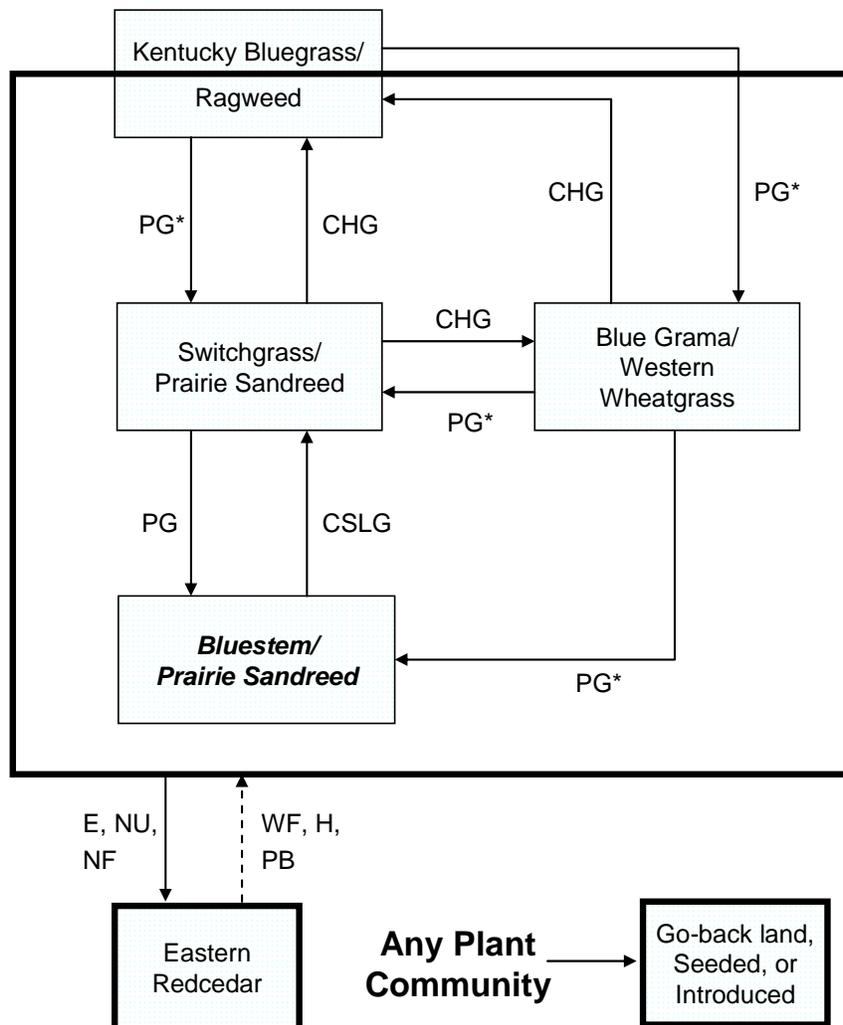
Historically, large areas of blowing sand resulted in the active movement of the sand dunes. Evaporation from the soil surface was extremely high due to the large areas of bare ground, lack of litter and sparse plant populations. The transpiration rate of these sparse plant populations was also high due to the harsh soil environment. Occasional wild fires, severe grazing by transient bison herds and drought contributed to the lack of stability of the sand dunes. This lack of stability caused the dunes to go back and forth through multiple stages of plant succession over the course of time. Early perennial plants such as sandhill muhly, blowout grass, and blowout penstemon were common due to their ability to tolerate the movement of the sand and droughty conditions. As these plants began to colonize and stabilize the sand movement, other perennials such as prairie sandreed, sand bluestem, hairy grama, lemon scurfpea, and rose slowly became evident on the site. Annual plants such as sandbur, Texas croton, and annual sunflower eventually colonized the areas between the perennials.

As this site deteriorates, species such as prairie sandreed, little bluestem, sand dropseed, and blue grama will increase initially. Species such as sand and/or big bluestem, switchgrass, and Indiangrass will decrease in frequency and production. With continued improper management, prairie sandreed and little bluestem will also decrease. The site is resilient and well adapted to the Northern Great Plains climatic conditions. The diversity in plant species allows for high drought resistance.

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. Subclimax 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; **CSLG** – Continuous season-long grazing; **E** – Encroachment; **H** – Harvest; **NF** – No fire; **NU** – Non-use; **PB** – Prescribed burning; **PG** – Prescribed grazing w/ adequate recovery period; **WF** – Wildfire; \*If tall warm-season grass remnants are present.

**Plant Community Composition and Group Annual Production**

COMMON/GROUP NAME	SCIENTIFIC NAME	SYMBOL	Bluestem/Prairie Sandreed		
			Group	lbs./acre	% Comp
<b>GRASSES &amp; GRASS-LIKES</b>				2400 - 2850	80 - 95
<b>BLUESTEM</b>			1	600 - 1050	20 - 35
sand bluestem	Andropogon hallii	ANHA	1	600 - 1050	20 - 35
big bluestem	Andropogon gerardii	ANGE	1	0 - 300	0 - 10
prairie sandreed	Calamovilfa longifolia	CALO	2	450 - 750	15 - 25
little bluestem	Schizachyrium scoparium	SCSC	3	450 - 750	15 - 25
<b>NEEDLEGRASS</b>			4	150 - 450	5 - 15
needleandthread	Hesperostipa comata ssp. comata	HECOC8	4	150 - 300	5 - 10
porcupine grass	Hesperostipa spartea	HESP11	4	0 - 150	0 - 5
<b>GRAMA</b>			5	90 - 300	3 - 10
blue grama	Bouteloua gracilis	BOGR2	5	90 - 300	3 - 10
hairy grama	Bouteloua hirsuta	BOHI2	5	0 - 150	0 - 5
<b>OTHER WARM-SEASON</b>			6	450 - 900	15 - 30
switchgrass	Panicum virgatum	PAVI2	6	300 - 600	10 - 20
sideoats grama	Bouteloua curtipendula	BOCU	6	0 - 150	0 - 5
sand dropseed	Sporobolus cryptandrus	SPCR	6	0 - 150	0 - 5
sand paspalum	Paspalum setaceum	PASE5	6	0 - 150	0 - 5
sand lovegrass	Eragrostis trichodes	ERTR3	6	0 - 150	0 - 5
purple lovegrass	Eragrostis spectabilis	ERSP	6	0 - 90	0 - 3
Indiangrass	Sorghastrum nutans	SONU2	6	150 - 450	5 - 15
<b>NATIVE GRASS/GRASS-LIKES</b>			7	150 - 300	5 - 10
western wheatgrass	Pascopyrum smithii	PASM	7	30 - 150	1 - 5
prairie junegrass	Koeleria macrantha	KOMA	7	30 - 150	1 - 5
Scribner panicum	Dichanthelium oligosanthes var. scribnerianum	DIOLS	7	30 - 150	1 - 5
sedge	Carex spp.	CAREX	7	30 - 150	1 - 5
other perennial grasses		2GP	7	0 - 60	0 - 2
<b>FORBS</b>			9	150 - 300	5 - 10
gayfeather	Liatris spp.	LIATR	9	0 - 60	0 - 2
green sagewort	Artemisia dracunculus	ARDR4	9	0 - 30	0 - 1
heath aster	Symphotrichum ericoides	SYER	9	0 - 60	0 - 2
goldenrod	Solidago spp.	SOLID	9	0 - 30	0 - 1
penstemon	Penstemon spp.	PENST	9	0 - 30	0 - 1
prairie coneflower	Ratibida columnifera	RACO3	9	0 - 30	0 - 1
rush skeletonweed	Lygodesmia juncea	LYJU	9	0 - 30	0 - 1
scurfpea	Psoralegium spp.	PSORA2	9	0 - 30	0 - 1
spiderwort	Tradescantia spp.	TRADE	9	0 - 30	0 - 1
stiff sunflower	Helianthus pauciflorus	HEPA19	9	0 - 30	0 - 1
thistle	Cirsium spp.	CIRSI	9	0 - 30	0 - 1
verbena	Verbena spp.	VERBE	9	0 - 30	0 - 1
western ragweed	Ambrosia psilostachya	AMPS	9	0 - 60	0 - 2
other perennial forbs		2FP	9	0 - 60	0 - 2
other annual forbs		2FA	9	0 - 30	0 - 1
<b>SHRUBS</b>			10	30 - 150	1 - 5
rose	Rosa spp.	ROSA5	10	0 - 60	0 - 2
leadplant	Amorpha canescens	AMCA6	10	0 - 90	0 - 3
western sandcherry	Prunus pumila var. besseyi	PRPUB	10	0 - 30	0 - 1
other shrubs		2SHRUB	10	30 - 90	1 - 3

Annual Production lbs./acre	LOW	RV	HIGH
<b>GRASSES &amp; GRASS-LIKES</b>	2130	2685	3020
<b>FORBS</b>	145	225	325
<b>SHRUBS</b>	25	90	155
<b>TOTAL</b>	2300	3000	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**

COMMON/GROUP NAME	SYMBOL	Bluestem/Prairie Sandreed			Switchgrass/Prairie Sandreed			Blue Grama/Western Wheatgrass		
		Grp	lbs./acre	% Comp	Grp	lbs./acre	% Comp	Grp	lbs./acre	% Comp
<b>GRASSES &amp; GRASS-LIKES</b>			2400 - 2850	80 - 95		2000 - 2375	80 - 95		1360 - 1615	80 - 95
<b>BLUESTEM</b>		1	600 - 1050	20 - 35	1	250 - 500	10 - 20	1	0 - 85	0 - 5
sand bluestem	ANHA	1	600 - 1050	20 - 35	1	250 - 500	10 - 20	1	0 - 85	0 - 5
big bluestem	ANGE	1	0 - 300	0 - 10	1	0 - 250	0 - 10	1	0 - 85	0 - 5
prairie sandreed	CALO	2	450 - 750	15 - 25	2	500 - 750	20 - 30	2	85 - 255	5 - 15
little bluestem	SCSC	3	450 - 750	15 - 25	3	500 - 750	20 - 30	3	85 - 255	5 - 15
<b>NEEDLEGRASS</b>		4	150 - 450	5 - 15	4	125 - 250	5 - 10	4	0 - 170	0 - 10
needleandthread	HECOC8	4	150 - 300	5 - 10	4	125 - 250	5 - 10	4	0 - 170	0 - 10
porcupine grass	HESP11	4	0 - 150	0 - 5	4	0 - 125	0 - 5	4	0 - 85	0 - 5
<b>GRAMA</b>		5	90 - 300	3 - 10	5	25 - 250	1 - 10	5	340 - 510	20 - 30
blue grama	BOGR2	5	90 - 300	3 - 10	5	25 - 250	1 - 10	5	340 - 510	20 - 30
hairy grama	BOHI2	5	0 - 150	0 - 5				5	0 - 85	0 - 5
<b>OTHER WARM-SEASON</b>		6	450 - 900	15 - 30	6	500 - 875	20 - 35	6	170 - 425	10 - 25
switchgrass	PAVI2	6	300 - 600	10 - 20	6	375 - 625	15 - 25	6	0 - 85	0 - 5
sideoats grama	BOCU	6	0 - 150	0 - 5						
sand dropseed	SPCR	6	0 - 150	0 - 5	6	0 - 250	0 - 10	6	85 - 255	5 - 15
sand paspalum	PASE5	6	0 - 150	0 - 5	6	0 - 125	0 - 5	6	0 - 85	0 - 5
sand lovegrass	ERTR3	6	0 - 150	0 - 5						
purple lovegrass	ERSP	6	0 - 90	0 - 3	6	0 - 125	0 - 5	6	85 - 170	5 - 10
Indiangrass	SONU2	6	150 - 450	5 - 15	6	125 - 375	5 - 15			
<b>NATIVE GRASS/GRASS-LIKES</b>		7	150 - 300	5 - 10	7	125 - 375	5 - 15	7	340 - 680	20 - 40
western wheatgrass	PASM	7	30 - 150	1 - 5	7	25 - 250	1 - 10	7	170 - 340	10 - 20
prairie junegrass	KOMA	7	30 - 150	1 - 5	7	25 - 125	1 - 5	7	17 - 170	1 - 10
Scribner panicum	DIOLS	7	30 - 150	1 - 5	7	25 - 125	1 - 5	7	85 - 170	5 - 10
sedge	CAREX	7	30 - 150	1 - 5	7	25 - 125	1 - 5	7	85 - 170	5 - 10
other perennial grasses	2GP	7	0 - 60	0 - 2	7	0 - 50	0 - 2	7	0 - 34	0 - 2
<b>NON-NATIVE GRASSES</b>		8			8	0 - 125	0 - 5	8	85 - 340	5 - 20
cheatgrass	B RTE				8	0 - 50	0 - 2	8	0 - 85	0 - 5
bluegrass	POA				8	0 - 125	0 - 5	8	0 - 255	0 - 15
<b>FORBS</b>		9	150 - 300	5 - 10	9	125 - 250	5 - 10	9	85 - 340	5 - 20
annual sunflower	HEAN3							9	0 - 17	0 - 1
gayfeather	LIATR	9	0 - 60	0 - 2	9	0 - 50	0 - 2	9	0 - 34	0 - 2
green sagewort	ARDR4	9	0 - 30	0 - 1	9	0 - 25	0 - 1	9	0 - 34	0 - 2
heath aster	SYER	9	0 - 60	0 - 2	9	0 - 50	0 - 2	9	0 - 51	0 - 3
goldenrod	SOLID	9	0 - 30	0 - 1	9	0 - 25	0 - 1	9	0 - 17	0 - 1
penstemon	PENST	9	0 - 30	0 - 1	9	0 - 25	0 - 1	9	0 - 17	0 - 1
prairie coneflower	RACO3	9	0 - 30	0 - 1	9	0 - 25	0 - 1	9	0 - 17	0 - 1
pussytoes	ANTEN				9	0 - 25	0 - 1	9	0 - 17	0 - 1
Rocky Mountain beeplant	CLSE							9	0 - 17	0 - 1
rush skeletonweed	LYJU	9	0 - 30	0 - 1	9	0 - 25	0 - 1	9	0 - 17	0 - 1
scurfpea	PSORA2	9	0 - 30	0 - 1	9	0 - 25	0 - 1	9	0 - 17	0 - 1
spiderwort	TRADE	9	0 - 30	0 - 1	9	0 - 25	0 - 1	9	0 - 17	0 - 1
stiff sunflower	HEPA19	9	0 - 30	0 - 1						
thistle	CIRSI	9	0 - 30	0 - 1	9	0 - 25	0 - 1	9	0 - 17	0 - 1
verbena	VERBE	9	0 - 30	0 - 1	9	0 - 25	0 - 1	9	0 - 17	0 - 1
western ragweed	AMPS	9	0 - 60	0 - 2	9	0 - 50	0 - 2	9	0 - 51	0 - 3
other perennial forbs	2FP	9	0 - 60	0 - 2	9	0 - 50	0 - 2	9	0 - 34	0 - 2
other annual forbs	2FA	9	0 - 30	0 - 1	9	0 - 25	0 - 1	9	0 - 34	0 - 2
<b>SHRUBS</b>		10	30 - 150	1 - 5	10	25 - 250	1 - 10	10	17 - 85	1 - 5
rose	ROSA5	10	0 - 60	0 - 2	10	0 - 75	0 - 3	10	0 - 17	0 - 1
leadplant	AMCA6	10	0 - 90	0 - 3	10	0 - 125	0 - 5			
western sandcherry	PRPUB	10	0 - 30	0 - 1	10	0 - 25	0 - 1	10	0 - 17	0 - 1
other shrubs	2SHRUB	10	30 - 90	1 - 3	10	0 - 125	0 - 5	10	0 - 85	0 - 5
<b>TREES</b>		11			11			11		
eastern redcedar	JUVI									
<b>Annual Production lbs./acre</b>			LOW RV HIGH		LOW RV HIGH		LOW RV HIGH		LOW RV HIGH	
<b>GRASSES &amp; GRASS-LIKES</b>			2130 - 2685 - 3020		1660 - 2175 - 2650		1305 - 1437 - 1535			
<b>FORBS</b>			145 - 225 - 325		120 - 188 - 275		80 - 213 - 375			
<b>SHRUBS</b>			25 - 90 - 155		20 - 138 - 275		15 - 51 - 90			
<b>TREES</b>										
<b>TOTAL</b>			2300 - 3000 - 3500		1800 - 2500 - 3200		1400 - 1700 - 2000			

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

**Plant Community Composition and Group Annual Production**

COMMON/GROUP NAME	SYMBOL	Bluestem/Prairie Sandreed			Kentucky Bluegrass/Ragweed			Eastern Redcedar		
		Grp	lbs./acre	% Comp	Grp	lbs./acre	% Comp	Grp	lbs./acre	% Comp
<b>GRASSES &amp; GRASS-LIKES</b>			2400 - 2850	80 - 95		900 - 1080	75 - 90		780 - 1040	60 - 80
<b>BLUESTEM</b>		1	600 - 1050	20 - 35	1			1	0 - 65	0 - 5
sand bluestem	ANHA	1	600 - 1050	20 - 35				1	0 - 65	0 - 5
big bluestem	ANGE	1	0 - 300	0 - 10				1	0 - 65	0 - 5
prairie sandreed	CALO	2	450 - 750	15 - 25	2	0 - 60	0 - 5	2	0 - 26	0 - 2
little bluestem	SCSC	3	450 - 750	15 - 25	3	0 - 60	0 - 5	3	65 - 130	5 - 10
<b>NEEDLEGRASS</b>		4	150 - 450	5 - 15	4	0 - 120	0 - 10	4	130 - 195	10 - 15
needleandthread	HECOC8	4	150 - 300	5 - 10	4	0 - 120	0 - 10	4	130 - 195	10 - 15
porcupine grass	HESP11	4	0 - 150	0 - 5	4	0 - 60	0 - 5	4	0 - 65	0 - 5
<b>GRAMA</b>		5	90 - 300	3 - 10	5	60 - 180	5 - 15	5	65 - 130	5 - 10
blue grama	BOGR2	5	90 - 300	3 - 10	5	60 - 180	5 - 15	5	65 - 130	5 - 10
hairy grama	BOHI2	5	0 - 150	0 - 5	5	0 - 60	0 - 5	5	0 - 65	0 - 5
<b>OTHER WARM-SEASON</b>		6	450 - 900	15 - 30	6	120 - 240	10 - 20	6	39 - 195	3 - 15
switchgrass	PAVI2	6	300 - 600	10 - 20				6	0 - 65	0 - 5
sideoats grama	BOCU	6	0 - 150	0 - 5				6	13 - 65	1 - 5
sand dropseed	SPCR	6	0 - 150	0 - 5	6	120 - 240	10 - 20	6	26 - 130	2 - 10
sand paspalum	PASE5	6	0 - 150	0 - 5				6	0 - 26	0 - 2
sand lovegrass	ERTR3	6	0 - 150	0 - 5				6	0 - 26	0 - 2
purple lovegrass	ERSP	6	0 - 90	0 - 3	6	0 - 120	0 - 10	6	0 - 39	0 - 3
Indiangrass	SONU2	6	150 - 450	5 - 15						
<b>NATIVE GRASS/GRASS-LIKES</b>		7	150 - 300	5 - 10	7	180 - 300	15 - 25	7	65 - 260	5 - 20
western wheatgrass	PASM	7	30 - 150	1 - 5	7	12 - 120	1 - 10	7	26 - 130	2 - 10
prairie junegrass	KOMA	7	30 - 150	1 - 5	7	12 - 60	1 - 5	7	13 - 65	1 - 5
Scribner panicum	DIOLS	7	30 - 150	1 - 5	7	60 - 120	5 - 10	7	0 - 13	0 - 1
sedge	CAREX	7	30 - 150	1 - 5	7	60 - 120	5 - 10	7	26 - 104	2 - 8
other perennial grasses	2GP	7	0 - 60	0 - 2	7	0 - 24	0 - 2	7	0 - 65	0 - 5
<b>NON-NATIVE GRASSES</b>		8			8	120 - 360	10 - 30	8	13 - 65	1 - 5
cheatgrass	BRTE				8	0 - 120	0 - 10	8	0 - 65	0 - 5
bluegrass	POA				8	120 - 240	10 - 20	8	13 - 65	1 - 5
<b>FORBS</b>		9	150 - 300	5 - 10	9	60 - 240	5 - 20	9	65 - 130	5 - 10
annual sunflower	HEAN3				9	0 - 36	0 - 3			
gayfeather	LIATR	9	0 - 60	0 - 2				9	0 - 13	0 - 1
green sagewort	ARDR4	9	0 - 30	0 - 1	9	0 - 60	0 - 5	9	13 - 39	1 - 3
heath aster	SYER	9	0 - 60	0 - 2	9	0 - 36	0 - 3	9	13 - 26	1 - 2
goldenrod	SOLID	9	0 - 30	0 - 1	9	0 - 12	0 - 1	9	13 - 39	1 - 3
penstemon	PENST	9	0 - 30	0 - 1				9	0 - 13	0 - 1
prairie coneflower	RACO3	9	0 - 30	0 - 1				9	13 - 26	1 - 2
pussytoes	ANTEN				9	0 - 12	0 - 1	9	0 - 13	0 - 1
Rocky Mountain beeplant	CLSE				9	0 - 36	0 - 3			
rush skeletonweed	LYJU	9	0 - 30	0 - 1	9	0 - 12	0 - 1	9	0 - 13	0 - 1
scurfpea	PSORA2	9	0 - 30	0 - 1	9	0 - 12	0 - 1	9	0 - 13	0 - 1
spiderwort	TRADE	9	0 - 30	0 - 1				9	0 - 26	0 - 2
stiff sunflower	HEPA19	9	0 - 30	0 - 1						
thistle	CIRSI	9	0 - 30	0 - 1	9	0 - 36	0 - 3	9	0 - 26	0 - 2
verbena	VERBE	9	0 - 30	0 - 1	9	0 - 36	0 - 3	9	13 - 39	1 - 3
western ragweed	AMPS	9	0 - 60	0 - 2	9	0 - 60	0 - 5	9	0 - 26	0 - 2
other perennial forbs	2FP	9	0 - 60	0 - 2	9	0 - 24	0 - 2	9	0 - 39	0 - 3
other annual forbs	2FA	9	0 - 30	0 - 1	9	0 - 36	0 - 3	9	0 - 65	0 - 5
<b>SHRUBS</b>		10	30 - 150	1 - 5	10	12 - 60	1 - 5	10	65 - 195	5 - 15
rose	ROSA5	10	0 - 60	0 - 2	10	0 - 12	0 - 1	10	13 - 65	1 - 5
leadplant	AMCA6	10	0 - 90	0 - 3				10	13 - 65	1 - 5
western sandcherry	PRPUB	10	0 - 30	0 - 1				10	0 - 13	0 - 1
other shrubs	2SHRUB	10	30 - 90	1 - 3	10	0 - 60	0 - 5	10	39 - 130	3 - 10
<b>TREES</b>		11			11			11	65 - 195	5 - 15
eastern redcedar	JUVI							11	65 - 195	5 - 15
<b>Annual Production lbs./acre</b>			LOW RV HIGH		LOW RV HIGH		LOW RV HIGH		LOW RV HIGH	
<b>GRASSES &amp; GRASS-LIKES</b>			2130 - 2685 - 3020		835 - 1014 - 1185		620 - 943 - 1265			
<b>FORBS</b>			145 - 225 - 325		55 - 150 - 250		60 - 98 - 135			
<b>SHRUBS</b>			25 - 90 - 155		10 - 36 - 65		60 - 130 - 200			
<b>TREES</b>							60 - 130 - 200			
<b>TOTAL</b>			2300 - 3000 - 3500		900 - 1200 - 1500		800 - 1300 - 1800			

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

### Plant Community and Vegetation State Narratives

Following are the narratives for each of the described plant communities. These plant communities may not represent every possibility, but they are the most prevalent and repeatable plant communities. The plant composition tables shown above have been developed from the best available knowledge at the time of this revision. As more 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 USDA Natural Resources Conservation Service (NRCS) National Range and Pasture Handbook, 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 primarily based on the Bluestem/Prairie Sandreed Plant Community. The site evolved with grazing by large herbivores and is well suited for grazing by domestic livestock. This plant community can be found on areas that are properly managed. The potential vegetation is about 85 percent grasses or grass-like plants, 10 percent forbs, and 5 percent shrubs. Warm-season mid and tall grasses dominate this plant community. Principal grasses are prairie sandreed, sand bluestem, big bluestem, and little bluestem. The cool season grasses, needleandthread, and western wheatgrass are important. Grama grasses and sedges occur as an understory. Forbs and shrubs are not abundant.

Natural fire played a significant role in the succession of this site by limiting eastern redcedar from becoming established. Wildfires have been actively controlled in recent times, allowing occasional eastern redcedar encroachment. The diversity in plant species allows for high drought tolerance. This is a healthy and sustainable plant community (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 a normal year:

Growth curve number: NE6637

Growth curve name: Eroded Tableland, warm-season dominant, cool-season subdominant.

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

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 season-long grazing will convert the plant community to the *Switchgrass/Prairie Sandreed Plant Community*.

#### Switchgrass/Prairie Sandreed Plant Community

This plant community is resilient and can be found on areas that have been properly managed with grazing for long periods of time. The potential vegetation is about 80 percent grasses or grass-like plants, 10 percent forbs, and 10 percent shrubs. Dominant grasses include switchgrass, little bluestem, and prairie sandreed. Other grasses include sand bluestem and Indiangrass. Dominant forbs include heath aster, gayfeather, and western ragweed. Dominant shrubs include leadplant and rose. The bluestems and needlegrass have decreased, while prairie sandreed and switchgrass have increased. Forbs remain in balance similar to the Bluestem/Prairie Sandreed Plant Community and shrubs, such as rose and

leadplant, show a moderate increase under current management conditions. This plant community maintains diversity while sustaining production.

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

Growth curve number: NE6637

Growth curve name: Eroded Tableland, warm-season dominant, cool-season subdominant.

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

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 will convert the plant community to the *Kentucky Bluegrass/Ragweed Plant Community*.
- Continuous season-long grazing may convert the plant community to the *Blue Grama/Western Wheatgrass Plant Community*.
- Prescribed grazing will move this plant community back to the *Bluestem/Prairie Sandreed Plant Community*.

### Blue Grama/Western Wheatgrass Plant Community

This plant community develops with heavy livestock grazing, usually season-long. Plant diversity is diminished as the bluestems, prairie sandreed, switchgrass, and Indiangrass are removed from the plant community. Small isolated plants may exist in a prostrate form to avoid defoliation. The potential vegetation is about 80 percent grasses or grass-like plants, 15 percent forbs, and 5 percent shrubs. Dominant grasses include blue grama and western wheatgrass. Other grasses or grass-likes include sand dropseed, needleandthread, prairie sandreed, and sedges. Dominant forbs include green sagewort, heath aster, gayfeather, and western ragweed. Dominant shrubs include rose and western sandcherry. Cool-season plants such as western wheatgrass, prairie Junegrass, and Scribners panicum increase. Blue grama will actually increase due to its ability to avoid grazing because of its short growth form. Forbs such as western ragweed and green sagewort will tend to increase, especially in periods of favorable moisture. Rose, leadplant, and western sandcherry will diminish while small soapweed, cactus, and other less palatable shrubs will increase.

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

Growth curve number: NE6636

Growth curve name: Eroded Tableland, 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:

- Continuous heavy grazing will convert the plant community to the *Kentucky Bluegrass/Ragweed Plant Community*. This is a relatively stable plant community that

requires a considerable amount of input to return it to the *Bluestem/Prairie Sandreed Plant Community*.

- Prescribed grazing will move this plant community to the *Switchgrass/Prairie Sandreed Plant Community* or the *Bluestem/Prairie Sandreed Plant Community*, depending on how long it has been in this plant community and the number and species of tall warm-season grass remnants remaining.

### **Kentucky Bluegrass/Ragweed Plant Community**

With sustained heavy stocking during the summer months this plant community will become dominated by cool season grasses and forbs. The potential vegetation is about 75 percent grasses or grass-like plants, 20 percent forbs, and 5 percent shrubs. Dominant grasses include Kentucky bluegrass, sand dropseed, and blue grama. Other grasses or grass-likes include Scribner panicum, sedges, and smooth brome. Dominant forbs include green sagewort, western ragweed, Rocky Mountain beeplant, annual sunflower, and thistles. The palatable warm-season grasses are replaced by blue grama and sand dropseed. Cool-season grasses such as Scribner panicum, annual brome, and bluegrass will increase and fill the void left by the disappearing warm-season tall grasses. Sedges will flourish in the understory. Western ragweed and green sagewort increase in abundance along with other less-palatable forbs. Invader thistles and annual forbs increase along with grazing resistant shrubs such as cactus and small soapweed. Once this plant community is reached, time and external resources will be needed to see any immediate recovery in the diversity of this plant community.

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

Growth curve number: NE6635

Growth curve name: Eroded Tableland, cool-season dominant, warm-season subdominant.

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

JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
0	0	5	10	25	30	15	5	5	5	0	0

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

- Prescribed grazing will convert the plant community to either the *Switchgrass/Prairie Sandreed Plant Community* or the *Blue Grama/Western Wheatgrass Plant Community*. The direction this plant community moves depends on the characteristics of the plant community prior to converting to the *Kentucky Bluegrass/Ragweed Plant Community*.

### **Eastern Redcedar Plant Community**

This plant community can develop whenever eastern redcedar is adjacent to the originating plant community, and encroachment of the eastern redcedar occurs. This can occur in areas adjacent to a seed source, such as near windbreaks. With properly managed intensive grazing, encroachment can be prevented. This plant community is made up of trees with a canopy cover of 15 percent or greater consisting of trees 6 feet or taller. The herbaceous component decreases proportionately in relation to the percent cover of eastern redcedar.

This plant community is resistant to change, and resilient given normal disturbances. In higher canopy cover situations, the soil erosion will increase in relation to most of the plant communities from which this plant community originated. The water cycle is also significantly altered under higher canopy cover. Infiltration is reduced because of interception of rainfall by

the canopy. Runoff is not greatly increased, as the soil is still capable of absorbing the rainfall that reaches the soil surface.

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

Growth curve number: NE6644

Growth curve name: Eroded Tableland, heavy conifer canopy.

Growth curve description: Mature eastern redcedar 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:

- With actions that will remove the eastern redcedar (prescribed burning, wildfire and/or harvest), followed by prescribed grazing, succession will progress leading to the *Bluestem/Prairie Sandreed Plant Community*.

### **Go-back land, Seeded, or Invaded**

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

The **Go-back** state can be reached whenever severe mechanical disturbance occurs. The vegetation on this plant community varies greatly, sometimes being dominated by Scribner panicum, bluegrass, three-awn, sand dropseed, marestail, green sagewort, and/or ragweed. Other plants that commonly occur on this plant community include sixweeks fescue, prairie sandreed, witchgrass, little bluestem, switchgrass, and needleandthread. Annual grasses and forbs have become established in the plant community.

The **Seeded** state is normally those areas seeded to native or nonnative species. It requires considerable investment to establish and has a variable life expectancy. In this case, the dynamics of the established plant community will no longer be described in this ecological site description, and reference should be made to the associated Forage Suitability Group Description.

The **Invaded** state includes areas that have been invaded, and are dominated by species such as smooth brome, Kentucky bluegrass, crested wheatgrass, nonnative 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:**

**Switchgrass/Prairie Sandreed Plant Community:**

**Blue Grama/Western Wheatgrass Plant Community:**

**Kentucky Bluegrass/Ragweed Plant Community:**

**Eastern Redcedar Plant Community:**

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

Common Name	Cattle	Sheep	Horses	Deer	Antelope	Bison	Elk
<b>Grasses &amp; Grass-likes</b>							
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
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
Indiangrass	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
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
porcupine grass	U P U D	N D N U	U P U D	N D N U	N D N U	U P U D	U P U D
prairie junegrass	U D U D	N D N U	U D U D	N D N U	N D N U	U D U D	U D U D
prairie sandreed	U D D U	U D U U	U D D U	U U D U	U U D U	U D D U	U D D U
purple lovegrass	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
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
sand lovegrass	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
sand paspalum	N U U N	N U N N	N U U N	N U N N	N U N N	N U U N	N U U 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
<b>Forbs</b>							
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
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
penstemon	U U U U	U P P U	U U U U	U P P U	U P P U	U U U U	U P P U
prairie coneflower	U U D U	U P P U	U U D U	U P P U	U P P U	U U D U	U P P U
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
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
thistle	U U U U	N N N N	U U U U	N N N N	N N N N	U U U U	N N N N
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
<b>Shrubs</b>							
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
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

**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 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.

<b>Plant Community</b>	<b>Average Annual Production (lbs./acre, air-dry)</b>	<b>Stocking Rate* (AUM/acre)</b>
Bluestem/Prairie Sandreed	3000	0.82
Switchgrass/Prairie Sandreed	2500	0.69
Blue Grama/Western Wheatgrass	1700	0.47
Kentucky Bluegrass/Ragweed	1200	0.33
Eastern Redcedar	1000	**

\*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).

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

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

## Hydrology Functions

Water is the principal factor limiting forage production on well drained portions of this site. 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).

For the interpretive plant community, rills and gullies should not typically be present. Water flow patterns should be barely distinguishable if at all present in well drained areas. Pedestals are only slightly present in association with bunchgrasses such as little bluestem. Litter typically falls in place and signs of movement are not common. Chemical and physical crusts are rare to non-existent. Cryptogamic crusts are present but only cover one to two percent of the soil surface. Overall, this site has the appearance of being extremely stable and productive.

## Recreational Uses

This site provides hunting opportunities for upland game species. The wide varieties of plants which bloom from spring until fall have an esthetic value that appeals to visitors.

## Wood Products

## Other Products

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

## Supporting Information

### Associated Sites

(066XY055NE) – Sands 22-25” P.Z.                      (066XY062NE) – Shallow to Gravel  
(066XY046NE) – Subirrigated                              (066XY032NE) – Sandy 18-22” P.Z.

### Similar Sites

(066XY055NE) – Sands 22-25” P.Z.  
[steeper slope; lower production; sand bluestem dominant; less little bluestem]

## 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: Wayne Bachman, Soil Scientist, NRCS; Stan Boltz, Range Management Specialist, NRCS; Anna Ferguson, Soil Conservationist, NRCS; Roger Hammer, Soil Scientist, NRCS; Dana Larsen, Range Management Specialist, NRCS; Dave Schmidt, Rangeland Management Specialist, NRCS; and Kim Stine, Rangeland Management Specialist, NRCS.

<u>Data Source</u>	<u>Number of Records</u>	<u>Sample Period</u>	<u>State</u>	<u>County</u>
SCS-RANGE-417	5	1974 – 1982	NE	Brown, Holt, Keya Paha, Knox

## State Correlation

This site has been correlated with NE and SD in MLRA 66.

### Field Offices Counties

Ainsworth, NE      Brown, Keya Paha & Rock  
Bloomfield, NE      Knox  
Burke, SD              Gregory  
Neligh, NE              Antelope

### Field Offices Counties

O’Neill, NE              Holt  
Spencer, NE              Boyd  
Winner, SD              Tripp

## Relationship to Other Established Classifications

Level IV Ecoregions of the Conterminous United States: 43i – Keya Paha Tablelands.

## 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

**Site Type: Rangeland**  
**MLRA: 66 – Dakota - Nebraska Eroded Tableland**

**Sandy 22-25” P.Z.**  
**R066XY054NE**

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

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

## Site Description Approval

\_\_\_\_\_  
NE, State Range Management Specialist

\_\_\_\_\_  
Date

\_\_\_\_\_  
SD, State Range Management Specialist

\_\_\_\_\_  
Date