United States Department of Agriculture
Natural Resources Conservation Service

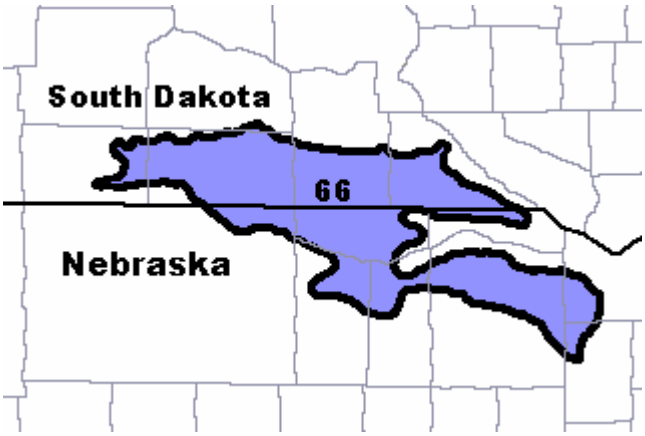
Ecological Site Description

Site Type: Rangeland

Site Name: Shallow

Site ID: R066XY040NE

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



Physiographic Features

This site occurs on side slopes and ridge tops of hills, plains, and uplands.

Landform: hill, ridge, plain **Aspect:** N/A

	Minimum	Maximum
Elevation (feet):	1900	3000
Slope (percent):	0	60
Water Table Depth (inches):	None	None
Flooding:		
Frequency:	None	None
Duration:	None	None
Ponding:		
Depth (inches):	None	None
Frequency:	None	None
Duration:	None	None
Runoff Class:	Very low	High

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 18 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 73°F (Harrington, SD), 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.

	Minimum	Maximum
Frost-free period (days):	127	154
Freeze-free period (days):	144	173
Mean Annual Precipitation (inches):	18	25

Average Monthly Precipitation (inches) and Temperature (ºF):

	Precip. Min.	Precip. Max	Temp. Min.	Temp. Max.
January	0.28	0.42	8.2	33.6
February	0.48	0.69	13.5	38.9
March	0.92	1.58	21.3	46.9
April	1.94	3.03	31.7	61.2
May	3.08	4.20	42.8	72.5
June	3.10	3.74	52.6	82.2
July	2.86	3.25	58.5	88.3
August	2.33	2.68	56.2	86.8
September	1.54	2.71	45.9	77.3
October	1.03	1.79	33.7	65.0
November	0.55	0.94	20.8	47.6
December	0.32	0.45	11.2	37.1

Climate Stations		Period	
Station ID	**Location or Name**	**From**	**To**
NE0050	Ainsworth	1948	2003
SD0778	Bonesteel	1956	2003
NE1365	Butte	1948	2003
SD3574	Harrington	1960	2003
NE8760	Valentine WSO AP	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 common features of soils in this site are the very fine sandy loam to silt loam textured subsoils and slopes of 0 to 60 percent. The soils in this site are well to somewhat excessively drained and formed in soft siltstone or sandstone. The very fine sandy loam to silt loam surface layer is 2 to 10 inches thick. The soils have a moderate infiltration rate. 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 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 15 percent. Low available water capacity caused by the shallow rooting depth strongly influences the soil-water-plant relationship.

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: residuum
Parent Material Origin: sedimentary, unspecified
Surface Texture: loam, silt loam, very fine sandy loam
Surface Texture Modifier: none
Subsurface Texture Group: loamy
Surface Fragments ≤3" (% Cover): 0-10
Surface Fragments >3" (%Cover): 0-20
Subsurface Fragments ≤3" (% Volume): 0-15
Subsurface Fragments >3" (% Volume): 0

	Minimum	Maximum
Drainage Class:	well	somewhat excessively
Permeability Class:	moderate	moderately rapid
Depth (inches):	10	20
Electrical Conductivity (mmhos/cm)*:	0	2
Sodium Absorption Ratio*:	0	0
Soil Reaction (1:1 Water)*:	6.6	8.4
Soil Reaction (0.1M CaCl2)*:	NA	NA
Available Water Capacity (inches)*:	2	3
Calcium Carbonate Equivalent (percent)*:	0	15

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

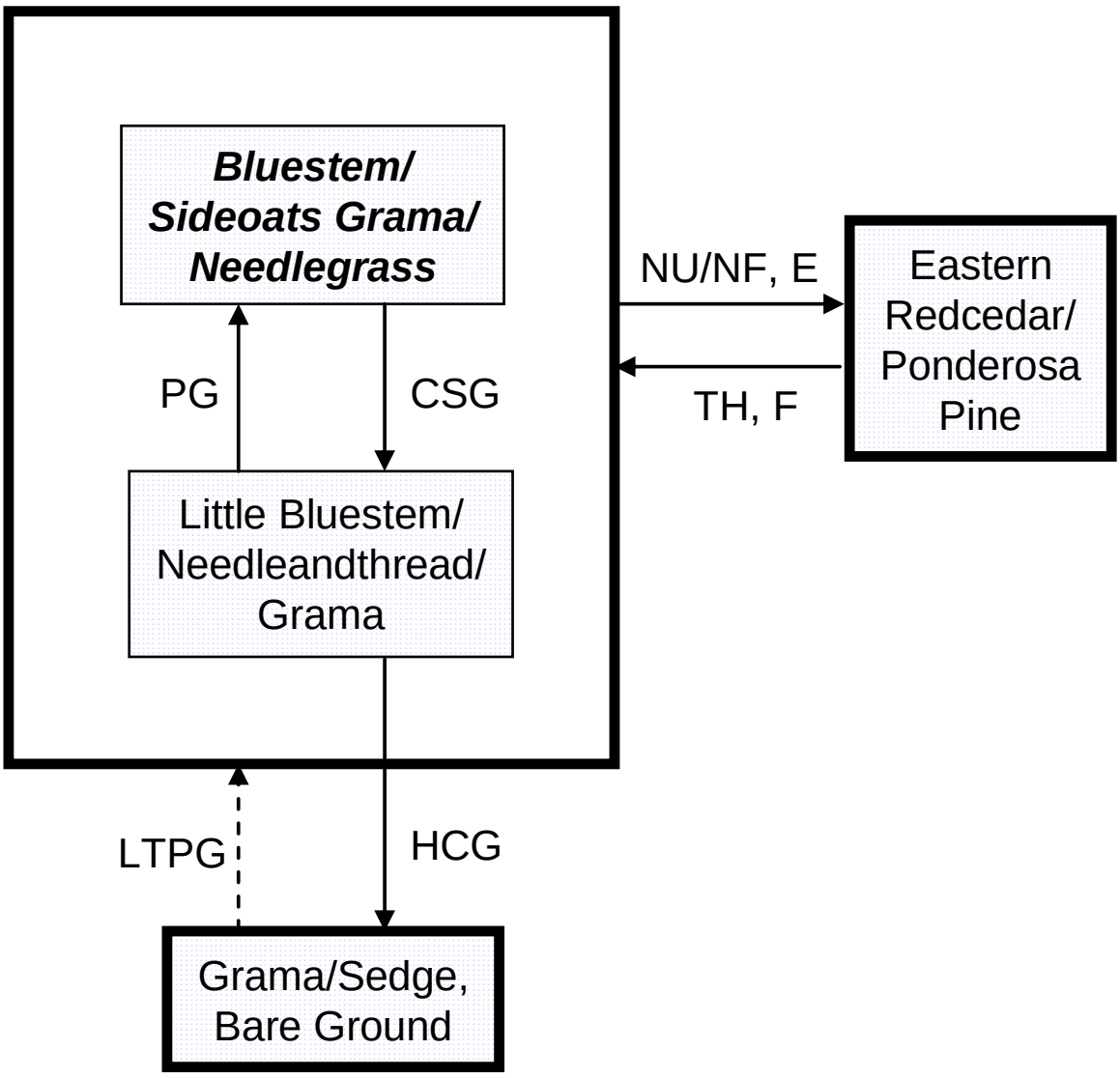
Plant Communities

Ecological Dynamics of the Site:
The site developed under Northern Great Plains climatic conditions and included natural influence of large herbivores and occasional fire. Changes will occur in the plant communities due to climatic conditions and/or management actions. Under continued adverse impacts, a decline in vegetative vigor and composition will occur. Under favorable vegetative management treatments, the site can return to the Bluestem/Sideoats Grama/Needlegrass Plant Community.

The plant community upon which interpretations are primarily based is the Bluestem/Sideoats Grama/Needlegrass Plant Community. This plant community 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



CSG – Continuous seasonal grazing; **E** – Encroachment; **F** – Fire; **HCG** – Heavy continuous grazing; **HCPC** – Historical Climax Plant Community; **LTPG** – Long-term prescribed grazing; **NU/NF** – Non-use, no fire for extended periods; **PG** – Prescribed grazing; **TH** – Thinning.

Plant Community Composition and Group Annual Production

			Bluestem/Sideoats Grama/ Needlegrass		
COMMON/GROUP NAME	**SCIENTIFIC NAME**	**SYMBOL**	**Group**	**lbs./acre**	**% Comp**
GRASSES & GRASS-LIKES				*1445 - 1615*	*85 - 95*
MID WARM-SEASON GRASSES			**1**	**255 - 510**	**15 - 30**
little bluestem	Schizachyrium scoparium	SCSC	1	170 - 425	10 - 25
sideoats grama	Bouteloua curtipendula	BOCU	1	170 - 425	10 - 25
plains muhly	Muhlenbergia cuspidata	MUCU3	1	34 - 170	2 - 10
purple lovegrass	Eragrostis spectabilis	ERSP	1	0 - 85	0 - 5
TALL WARM-SEASON GRASSES			**2**	**255 - 425**	**15 - 25**
big bluestem	Andropogon gerardii	ANGE	2	85 - 340	5 - 20
sand bluestem	Andropogon hallii	ANHA	2	85 - 340	5 - 20
prairie sandreed	Calamovilfa longifolia	CALO	2	34 - 170	2 - 10
Indiangrass	Sorghastrum nutans	SONU2	2	0 - 85	0 - 5
switchgrass	Panicum virgatum	PAVI2	2	0 - 85	0 - 5
COOL-SEASON BUNCHGRASSES			**3**	**170 - 340**	**10 - 20**
needleandthread	Hesperostipa comata ssp. comata	HECOC8	3	85 - 255	5 - 15
porcupine grass	Hesperostipa spartea	HESP11	3	85 - 255	5 - 15
green needlegrass	Nassella viridula	NAVI4	3	34 - 170	2 - 10
SHORT WARM-SEASON GRASSES			**4**	**85 - 255**	**5 - 15**
blue grama	Bouteloua gracilis	BOGR2	4	85 - 170	5 - 10
hairy grama	Bouteloua hirsuta	BOHI2	4	17 - 85	1 - 5
buffalograss	Bouteloua dactyloides	BODA2	4	0 - 85	0 - 5
threeawn	Aristida spp.	ARIST	4	0 - 34	0 - 2
MID RHIZOMATOUS COOL-SEASON GRASSES			**5**	**34 - 170**	**2 - 10**
western wheatgrass	Pascopyrum smithii	PASM	5	34 - 170	2 - 10
OTHER NATIVE GRASSES			**6**	**17 - 119**	**1 - 7**
prairie junegrass	Koeleria macrantha	KOMA	6	17 - 51	1 - 3
sand dropseed	Sporobolus cryptandrus	SPCR	6	17 - 51	1 - 3
Scribner panicum	Dichanthelium oligosanthes var. scribnerianur	DIOLS	6	0 - 34	0 - 2
Wilcox panicum	Dichanthelium wilcoxianum	DIWI5	6	0 - 34	0 - 2
Canada wildrye	Elymus canadensis	ELCA4	6	0 - 51	0 - 3
other perennial grasses		2GP	6	0 - 85	0 - 5
GRASS-LIKES			**7**	**34 - 136**	**2 - 8**
threadleaf sedge	Carex filifolia	CAFI	7	34 - 136	2 - 8
other grass-likes		2GL	7	0 - 85	0 - 5
FORBS			*9*	*85 - 170*	*5 - 10*
American vetch	Vicia americana	VIAM	9	17 - 34	1 - 2
catclaw sensitive briar	Mimosa nuttallii	MINU6	9	0 - 34	0 - 2
cudweed sagewort	Artemisia ludoviciana	ARLU	9	17 - 51	1 - 3
cutleaf ironplant	Machaeranthera pinnatifida	MAPI	9	0 - 17	0 - 1
deervetch	Lotus unifoliolatus var. unifoliolatus	LOUNU	9	0 - 17	0 - 1
dotted gayfeather	Liatris punctata	LIPU	9	17 - 34	1 - 2
goldenrod	Solidago spp.	SOLID	9	17 - 34	1 - 2
green sagewort	Artemisia dracunculus	ARDR4	9	17 - 51	1 - 3
hairy goldaster	Heterotheca villosa	HEVI4	9	17 - 34	1 - 2
heath aster	Symphyotrichum ericoides	SYER	9	0 - 17	0 - 1
Indian breadroot	Pediomelum spp.	PEDIO2	9	0 - 17	0 - 1
Lambert crazyweed	Oxytropis lambertii	OXLA3	9	0 - 17	0 - 1
milkvetch	Astragalus spp.	ASTRA	9	17 - 34	1 - 2
penstemon	Penstemon spp.	PENST	9	17 - 34	1 - 2
prairie coneflower	Ratibida columnifera	RACO3	9	17 - 34	1 - 2
purple coneflower	Echinacea angustifolia	ECAN2	9	17 - 51	1 - 3
purple prairie clover	Dalea purpurea	DAPU5	9	17 - 34	1 - 2
pussytoes	Antennaria spp.	ANTEN	9	0 - 17	0 - 1
rush skeletonweed	Lygodesmia juncea	LYJU	9	0 - 17	0 - 1
scarlet gaura	Gaura coccinea	GACO5	9	0 - 17	0 - 1
scarlet globemallow	Sphaeralcea coccinea	SPCO	9	0 - 17	0 - 1
scurfpea	Psoralidium spp.	PSORA2	9	17 - 51	1 - 3
serrateleaf eveningprimrose	Calylophus serrulatus	CASE12	9	0 - 17	0 - 1
spiny phlox	Phlox hoodii	PHHO	9	0 - 17	0 - 1
stemless hymenoxys	Tetraneuris acaulis var. acaulis	TEACA2	9	0 - 17	0 - 1
stiff sunflower	Helianthus pauciflorus	HEPA19	9	17 - 34	1 - 2
wavyleaf thistle	Cirsium undulatum	CIUN	9	0 - 34	0 - 2
western ragweed	Ambrosia psilostachya	AMPS	9	0 - 34	0 - 2
western yarrow	Achillea millefolium var. occidentalis	ACMIO	9	0 - 17	0 - 1
white prairie clover	Dalea candida	DACA7	9	0 - 17	0 - 1
wild onion	Allium spp.	ALLIU	9	0 - 17	0 - 1
native forbs		2FN	9	17 - 51	1 - 3
SHRUBS			*10*	*34 - 85*	*2 - 5*
fringed sagewort	Artemisia frigida	ARFR4	10	17 - 51	1 - 3
leadplant	Amorpha canescens	AMCA6	10	17 - 85	1 - 5
plains pricklypear	Opuntia polyacantha	OPPO	10	17 - 34	1 - 2
rose	Rosa spp.	ROSA5	10	17 - 51	1 - 3
skunkbush sumac	Rhus trilobata	RHTR	10	0 - 34	0 - 2
smooth sumac	Rhus glabra	RHGL	10	0 - 51	0 - 3
yucca	Yucca glauca	YUGL	10	17 - 34	1 - 2
other shrubs		2SHRUB	10	0 - 51	0 - 3
TREES			*11*	*0 - 34*	*0 - 2*
eastern redcedar	Juniperus virginiana	JUVI	11	0 - 34	0 - 2
ponderosa pine	Pinus ponderosa	PIPO	11	0 - 34	0 - 2
other trees		2TREE	11	0 - 34	0 - 2

Annual Production lbs./acre	LOW	RV	HIGH
GRASSES & GRASS-LIKES	890 -	1496	- 2000
FORBS	80 -	128	- 175
SHRUBS	30 -	60	- 90
TREES	0 -	17	- 35
TOTAL	1000 -	1700	- 2300

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

		Bluestem/Sideoats Grama/ Needlegrass			Little Bluestem/ Needleandthread/Grama			Grama/Sedge, Bare Ground			Eastern Redcedar/ Ponderosa Pine		
COMMON/GROUP NAME	**SYMBOL**	**Grp**	**lbs./acre**	**% Comp**	**Grp**	**lbs./acre**	**% Comp**	**Grp**	**lbs./acre**	**% Comp**	**Grp**	**lbs./acre**	**% Comp**
GRASSES & GRASS-LIKES			*1445 - 1615*	*85 - 95*		*1190 - 1330*	*85 - 95*		*800 - 900*	*80 - 90*		*480 - 720*	*40 - 60*
MID WARM-SEASON GRASSES		**1**	**255 - 510**	**15 - 30**	**1**	**280 - 490**	**20 - 35**	**1**	**10 - 120**	**1 - 12**	**1**	**0 - 60**	**0 - 5**
little bluestem	SCSC	1	170 - 425	10 - 25	1	210 - 490	15 - 35	1	0 - 100	0 - 10	1	0 - 60	0 - 5
sideoats grama	BOCU	1	170 - 425	10 - 25	1	70 - 210	5 - 15	1	0 - 100	0 - 10	1	0 - 36	0 - 3
plains muhly	MUCU3	1	34 - 170	2 - 10	1	14 - 70	1 - 5				1	0 - 24	0 - 2
purple lovegrass	ERSP	1	0 - 85	0 - 5	1	0 - 112	0 - 8	1	0 - 50	0 - 5			
TALL WARM-SEASON GRASSES		**2**	**255 - 425**	**15 - 25**	**2**	**28 - 112**	**2 - 8**	**2**	**0 - 50**	**0 - 5**	**2**		
big bluestem	ANGE	2	85 - 340	5 - 20	2	0 - 70	0 - 5						
sand bluestem	ANHA	2	85 - 340	5 - 20	2	0 - 70	0 - 5						
prairie sandreed	CALO	2	34 - 170	2 - 10	2	28 - 112	2 - 8	2	0 - 50	0 - 5			
Indiangrass	SONU2	2	0 - 85	0 - 5									
switchgrass	PAVI2	2	0 - 85	0 - 5									
COOL-SEASON BUNCHGRASSES		**3**	**170 - 340**	**10 - 20**	**3**	**140 - 280**	**10 - 20**	**3**	**20 - 100**	**2 - 10**	**3**	**0 - 120**	**0 - 10**
needleandthread	HECOC8	3	85 - 255	5 - 15	3	140 - 280	10 - 20	3	20 - 100	2 - 10	3	0 - 120	0 - 10
porcupine grass	HESP11	3	85 - 255	5 - 15	3	0 - 70	0 - 5				3	0 - 60	0 - 5
green needlegrass	NAVI4	3	34 - 170	2 - 10	3	0 - 70	0 - 5				3	0 - 120	0 - 10
SHORT WARM-SEASON GRASSES		**4**	**85 - 255**	**5 - 15**	**4**	**70 - 280**	**5 - 20**	**4**	**200 - 350**	**20 - 35**	**4**	**24 - 96**	**2 - 8**
blue grama	BOGR2	4	85 - 170	5 - 10	4	70 - 210	5 - 15	4	150 - 350	15 - 35	4	12 - 60	1 - 5
hairy grama	BOHI2	4	17 - 85	1 - 5	4	14 - 140	1 - 10	4	50 - 150	5 - 15	4	0 - 60	0 - 5
buffalograss	BODA2	4	0 - 85	0 - 5	4	0 - 112	0 - 8	4	0 - 100	0 - 10	4	0 - 36	0 - 3
threeawn	ARIST	4	0 - 34	0 - 2	4	14 - 70	1 - 5	4	20 - 100	2 - 10	4	12 - 60	1 - 5
MID RHIZOMATOUS COOL-SEASON		**5**	**34 - 170**	**2 - 10**	**5**	**28 - 112**	**2 - 8**	**5**	**10 - 50**	**1 - 5**	**5**	**12 - 84**	**1 - 7**
western wheatgrass	PASM	5	34 - 170	2 - 10	5	28 - 112	2 - 8	5	10 - 50	1 - 5	5	12 - 84	1 - 7
OTHER NATIVE GRASSES		**6**	**17 - 119**	**1 - 7**	**6**	**28 - 98**	**2 - 7**	**6**	**20 - 80**	**2 - 8**	**6**	**24 - 120**	**2 - 10**
prairie junegrass	KOMA	6	17 - 51	1 - 3	6	14 - 42	1 - 3	6	0 - 20	0 - 2	6	0 - 24	0 - 2
sand dropseed	SPCR	6	17 - 51	1 - 3	6	14 - 70	1 - 5	6	20 - 80	2 - 8	6	0 - 24	0 - 2
Scribner panicum	DIOLS	6	0 - 34	0 - 2	6	14 - 28	1 - 2	6	0 - 20	0 - 2	6	0 - 24	0 - 2
Wilcox panicum	DIWI5	6	0 - 34	0 - 2	6	0 - 28	0 - 2	6	0 - 20	0 - 2	6	0 - 24	0 - 2
Canada wildrye	ELCA4	6	0 - 51	0 - 3							6	12 - 96	1 - 8
other perennial grasses	2GP	6	0 - 85	0 - 5	6	0 - 70	0 - 5	6	0 - 50	0 - 5	6	0 - 60	0 - 5
GRASS-LIKES		**7**	**34 - 136**	**2 - 8**	**7**	**28 - 140**	**2 - 10**	**7**	**50 - 180**	**5 - 18**	**7**	**24 - 120**	**2 - 10**
threadleaf sedge	CAFI	7	34 - 136	2 - 8	7	28 - 140	2 - 10	7	50 - 180	5 - 18	7	24 - 120	2 - 10
other grass-likes	2GL	7	0 - 85	0 - 5	7	0 - 70	0 - 5	7	0 - 100	0 - 10	7	0 - 60	0 - 5
NON-NATIVE GRASSES		**8**			**8**	**28 - 70**	**2 - 5**	**8**	**50 - 150**	**5 - 15**	**8**	**120 - 216**	**10 - 18**
bluegrass	POA				8	14 - 70	1 - 5	8	20 - 150	2 - 15	8	60 - 216	5 - 18
cheatgrass	BRTE				8	14 - 42	1 - 3	8	20 - 100	2 - 10	8	24 - 120	2 - 10
smooth bromegrass	BRIN2				8	0 - 42	0 - 3	8	0 - 50	0 - 5	8	0 - 60	0 - 5
FORBS		*9*	*85 - 170*	*5 - 10*	*9*	*70 - 140*	*5 - 10*	*9*	*50 - 100*	*5 - 10*	*9*	*24 - 84*	*2 - 7*
American vetch	VIAM	9	17 - 34	1 - 2	9	0 - 14	0 - 1				9	0 - 12	0 - 1
catclaw sensitive briar	MINU6	9	0 - 34	0 - 2									
cudweed sagewort	ARLU	9	17 - 51	1 - 3	9	28 - 70	2 - 5	9	20 - 70	2 - 7	9	12 - 60	1 - 5
cutleaf ironplant	MAPI	9	0 - 17	0 - 1	9	0 - 14	0 - 1						
deervetch	LOUNU	9	0 - 17	0 - 1							9	0 - 12	0 - 1
dotted gayfeather	LIPU	9	17 - 34	1 - 2	9	0 - 14	0 - 1				9	0 - 24	0 - 2
goldenrod	SOLID	9	17 - 34	1 - 2	9	14 - 56	1 - 4	9	10 - 50	1 - 5	9	12 - 60	1 - 5
green sagewort	ARDR4	9	17 - 51	1 - 3	9	14 - 70	1 - 5	9	20 - 70	2 - 7	9	12 - 36	1 - 3
hairy goldaster	HEVI4	9	17 - 34	1 - 2	9	0 - 14	0 - 1						
heath aster	SYER	9	0 - 17	0 - 1	9	14 - 42	1 - 3	9	10 - 40	1 - 4	9	0 - 24	0 - 2
Indian breadroot	PEES	9	0 - 17	0 - 1	9	0 - 14	0 - 1						
Lambert crazyweed	OXLA3	9	0 - 17	0 - 1	9	0 - 14	0 - 1	9	0 - 10	0 - 1			
milkvetch	ASTRA	9	17 - 34	1 - 2	9	0 - 14	0 - 1						
penstemon	PENST	9	17 - 34	1 - 2	9	0 - 14	0 - 1						
prairie coneflower	RACO3	9	17 - 34	1 - 2	9	14 - 28	1 - 2	9	0 - 10	0 - 1	9	0 - 12	0 - 1
purple coneflower	ECAN2	9	17 - 51	1 - 3	9	0 - 28	0 - 2	9	0 - 10	0 - 1			
purple prairie clover	DAPU5	9	17 - 34	1 - 2	9	0 - 14	0 - 1				9	0 - 12	0 - 1
pussytoes	ANTEN	9	0 - 17	0 - 1	9	0 - 14	0 - 1	9	0 - 10	0 - 1	9	0 - 12	0 - 1
rush skeletonweed	LYJU	9	0 - 17	0 - 1	9	0 - 14	0 - 1	9	0 - 10	0 - 1	9	0 - 12	0 - 1
salsify	TRAGO				9	14 - 42	1 - 3	9	10 - 40	1 - 4	9	12 - 36	1 - 3
scarlet gaura	GACO5	9	0 - 17	0 - 1									
scarlet globemallow	SPCO	9	0 - 17	0 - 1	9	0 - 14	0 - 1	9	0 - 10	0 - 1			
scurfpea	PSORA2	9	17 - 51	1 - 3	9	14 - 56	1 - 4	9	10 - 40	1 - 4	9	0 - 24	0 - 2
serrateleaf eveningprimrose	CASE12	9	0 - 17	0 - 1									
spiny phlox	PHHO	9	0 - 17	0 - 1	9	0 - 14	0 - 1	9	0 - 10	0 - 1	9	0 - 12	0 - 1
stemless hymenoxys	TEACA2	9	0 - 17	0 - 1	9	0 - 14	0 - 1						
stiff sunflower	HEPA19	9	17 - 34	1 - 2	9	0 - 14	0 - 1						
sweetclover	MELIL				9	0 - 70	0 - 5	9	0 - 70	0 - 7	9	0 - 60	0 - 5
wavyleaf thistle	CIUN	9	0 - 34	0 - 2	9	14 - 42	1 - 3	9	0 - 30	0 - 3	9	0 - 12	0 - 1
western ragweed	AMPS	9	0 - 34	0 - 2	9	14 - 56	1 - 4	9	10 - 60	1 - 6	9	12 - 36	1 - 3
western yarrow	ACMIO	9	0 - 17	0 - 1	9	0 - 28	0 - 2	9	0 - 30	0 - 3	9	0 - 24	0 - 2
white prairie clover	DACA7	9	0 - 17	0 - 1									
wild onion	ALLIU	9	0 - 17	0 - 1	9	0 - 14	0 - 1				9	0 - 12	0 - 1
native forbs	2FN	9	17 - 68	1 - 4	9	14 - 42	1 - 3	9	0 - 20	0 - 2	9	12 - 36	1 - 3
introduced forbs	2FI				9	0 - 56	0 - 4	9	0 - 60	0 - 6	9	0 - 60	0 - 5
SHRUBS		*10*	*34 - 85*	*2 - 5*	*10*	*28 - 112*	*2 - 8*	*10*	*20 - 100*	*2 - 10*	*10*	*60 - 120*	*5 - 10*
fringed sagewort	ARFR4	10	17 - 51	1 - 3	10	14 - 70	1 - 5	10	20 - 80	2 - 8	10	12 - 36	1 - 3
leadplant	AMCA6	10	17 - 85	1 - 5	10	0 - 28	0 - 2				10	0 - 36	0 - 3
plains pricklypear	OPPO	10	17 - 34	1 - 2	10	14 - 42	1 - 3	10	10 - 40	1 - 4	10	12 - 24	1 - 2
rose	ROSA5	10	17 - 51	1 - 3	10	14 - 42	1 - 3	10	10 - 40	1 - 4	10	12 - 60	1 - 5
skunkbush sumac	RHTR	10	0 - 34	0 - 2	10	0 - 28	0 - 2	10	0 - 30	0 - 3	10	0 - 48	0 - 4
smooth sumac	RHGL	10	0 - 51	0 - 3	10	0 - 70	0 - 5	10	0 - 80	0 - 8	10	0 - 120	0 - 10
yucca	YUGL	10	17 - 34	1 - 2	10	0 - 56	0 - 4	10	0 - 50	0 - 5	10	0 - 12	0 - 1
other shrubs	2SHRUB	10	0 - 51	0 - 3	10	0 - 28	0 - 2	10	0 - 10	0 - 1	10	0 - 84	0 - 7
TREES		*11*	*0 - 34*	*0 - 2*	*11*	*0 - 28*	*0 - 2*	*11*	*0 - 20*	*0 - 2*	*11*	*240 - 540*	*20 - 45*
eastern redcedar	JUVI	11	0 - 34	0 - 2	11	0 - 28	0 - 2	11	0 - 20	0 - 2	11	60 - 480	5 - 40
ponderosa pine	PIPO	11	0 - 34	0 - 2	11	0 - 28	0 - 2	11	0 - 20	0 - 2	11	60 - 480	5 - 40
green ash	FRPE										11	0 - 300	0 - 25
boxelder	ACNE2										11	0 - 240	0 - 20
other trees	2TREE	11	0 - 34	0 - 2	11	0 - 28	0 - 2	11	0 - 20	0 - 2	11	0 - 300	0 - 25

Annual Production lbs./acre	LOW RV HIGH	LOW RV HIGH	LOW RV HIGH	LOW RV HIGH
GRASSES & GRASS-LIKES	890 - 1496 - 2000	710 - 1211 - 1610	440 - 855 - 1265	405 - 666 - 990
FORBS	80 - 128 - 175	65 - 105 - 145	45 - 75 - 105	20 - 54 - 85
SHRUBS	30 - 60 - 90	25 - 70 - 115	15 - 60 - 105	55 - 90 - 125
TREES	0 - 17 - 35	0 - 14 - 30	0 - 10 - 25	220 - 390 - 600
TOTAL	1000 - 1700 - 2300	800 - 1400 - 1900	500 - 1000 - 1500	700 - 1200 - 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. 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 (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/Sideoats Grama/Needlegrass Plant Community

Interpretations are primarily based on the Bluestem/Sideoats Grama/Needlegrass Plant Community (this is also considered climax). This plant community 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 with grazing and/or prescribed burning, and sometimes on areas receiving occasional short periods of rest. The potential vegetation is about 80 percent grasses or grass-like plants, 10 percent forbs, and 10 percent shrubs. A mixture of cool- and warm-season grasses dominates the site.

The major grasses include the little bluestem, sideoats grama, big bluestem, and/or sand bluestem, and needleandthread, and/or porcupine grass. Other grasses and grass-likes occurring include prairie sandreed, blue grama, western wheatgrass, plains muhly, and sedge. Significant forbs include purple coneflower and purple prairie clover. Shrubs occurring in this plant community include leadplant, rose, fringed sagewort, and yucca. Refer to the plant community composition and group annual production table for species composition and production.

This plant community is extremely resilient and well adapted to the Northern Great Plains climatic conditions. The diversity in plant species allows for high drought tolerance. Community dynamics, nutrient cycle, water cycle, and energy flow are functioning properly. Plant litter is properly distributed with very little movement offsite and natural plant mortality is very low. The diversity in plant species allows for high drought tolerance.

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 seasonal grazing or low stock densities under continuous season-long grazing will convert this plant community to the *Little Bluestem/Needleandthread/Grama Plant Community*.

- Encroachment (or escaped), nonuse, and no fire will lead to a *Eastern Redcedar/Ponderosa Pine Plant Community*. This occurs when this plant community is protected from natural fires, or controlled burning.

Little Bluestem/Needleandthread/Grama Plant Community

This plant community evolved under continuous seasonal grazing or in some cases with low stock densities under continuous season-long grazing. Needleandthread, little bluestem, and blue grama are significant species in this plant community. Big bluestem and sideoats grama will decrease, while the short grasses and grass-likes, such as blue grama, hairy grama, and sedge will increase. Forbs commonly found in this plant community include cudweed sagewort, green sagewort, and scurfpea. Significant shrubs include yucca, cactus, rose, and fringed sagewort. Refer to the plant community composition and group annual production table for species composition and production.

This plant community is moderately resistant to change. The herbaceous species present are well adapted to grazing; however, species composition can be altered through long-term overgrazing. If the herbaceous component is intact, it tends to be resilient if the disturbance is not long-term.

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:

- Heavy continuous grazing will convert the plant community to the *Grama/Sedge, Bare Ground Plant Community*.

- Prescribed grazing will convert this plant community to the *Bluestem/Sideoats Grama/Needlegrass Plant Community*.

Blue Grama/Sedge, Bare Ground Plant Community

This plant community evolves from heavy grazing over several years time. Diversity is lost, as the short grasses become dominant in the plant community. The grazing tolerant blue or hairy grama, and sedges replace big bluestem, little bluestem, western wheatgrass, and the needlegrasses. Sideoats grama remains in the plant community, but is less productive because of the mid-summer grazing pressure. Because of the grazing pressure, fringed sagewort, cudweed sagewort, yucca, green sagewort, western ragweed, and cactus become more prevalent in the plant community. Nonnative species such as bluegrass and cheatgrass will tend to invade this plant community.

This plant community is typically resistant to change. Runoff will increase and infiltration will decrease. Continued overuse results in considerable bare ground and high erosion potential.

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:

- Long-term prescribed grazing may convert this plant community to the *Little Bluestem/Needleandthread/Grama Plant Community*.

Eastern Redcedar/Ponderosa Pine Plant Community

Historically, ponderosa pine and juniper was confined to ridges and steep shallow slopes located adjacent to this ecological site. Currently, ponderosa pine and eastern redcedar are expanding on to this ecological site due to the suppression of fire. Tree canopy is greater than 15 percent of mature trees. Refer to the plant community composition and group annual production table for species composition and production.

Dominant grasses and grass-likes include needleandthread, green needlegrass, Canada wildrye, and bluegrass. Grasses and grass-likes of secondary importance include sedge, blue grama, western wheatgrass, and cheatgrass. Forbs commonly found in this community include cudweed sagewort, goldenrod, green sagewort, salsify, and western ragweed. Nonnative species such as cheatgrass and bluegrass will tend to invade this plant community.

When compared to the Bluestem/Sideoats Grama/Needlegrass Plant Community, ponderosa pine or eastern redcedar increases significantly. The grass component decreases dramatically as the buildup of needles increases. Annual production of the understory also decreases significantly. While the tree canopy provides excellent protection from the weather for both livestock and wildlife, it is not capable of supporting large numbers of wildlife and livestock due to decreased production.

This plant community is resistant to change. A significant reduction of eastern redcedar and ponderosa pine can only be accomplished through timber harvesting or crown fire. The 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 tree dominated areas can be costly and prove to be temporary without proper management (i.e., prescribed burning, and prescribed grazing).

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 tree canopy.
Growth curve description: Mature conifer/deciduous 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:

- Wildfire (hot, crown fires) will move this plant community to the *Little Bluestem/Needleandthread/Grama Plant Community*.
- Removal of cedar/pine by timber harvest will allow the understory to develop and convert to the *Little Bluestem/Needleandthread/Grama Plant Community*.

Ecological Site Interpretations

Animal Community – Wildlife Interpretations

-- Under Development --

Bluestem/Sideoats Grama/Needlegrass Plant Community:

Needleandthread/Little Bluestem/Grama Plant Community:

Grama/Sedge, Bare Ground Plant Community:

Eastern Redcedar/Ponderosa Pine Plant Community:

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

Common Name	Cattle	Sheep	Horses	Deer	Antelope	Bison	Elk
Grasses & 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
buffalograss	U U D U	N U D U	U U D U	N U D U	N U D U	U U D U	U U D 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
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
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
plains muhly	U U D U	U U D U	U U D U	N N N N	N N N N	U U D U	U U D U
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
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
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
threadleaf 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
threeawn	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 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
Wilcox panicum	U U U U	N U N N	U U U U	N U N N	N U N N	U U U U	U U U U
Forbs							
American vetch	U D P U	U P P U	U D P U	U P P U	U P P U	U D P U	U P P U
catclaw sensitive briar	U D P U	U P P U	U D P U	U P P U	U P P U	U D P U	U P P U
cudweed sagewort	U U U U	U U D U	U U U U	U U D U	U U D U	U U U U	U U D U
cutleaf ironplant	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
deervetch	U U U U	U D D U	U U U U	U D D U	U D D U	U U U U	U D D U
dotted 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
Indian breadroot	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 U
Lambert crazyweed	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
milkvetch	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 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
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
purple prairie clover	U D P U	U P P U	U D P U	U P P U	U P P U	U D P U	U P P U
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 gaura	U U U U	N U U N	U U U U	N U U N	N U U N	U U U U	N U U N
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
serrateleaf eveningprimros	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
spiny phlox	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
stemless hymenoxys	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
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
wavyleaf thistle	U U U U	N N N N	U U U U	N N N N	N N N N	U U U U	N N N N
western 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
western yarrow	U U U U	N U U N	U U U U	N U U N	N U U N	U U U U	N U U N
white 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
wild onion	U D U U	U D D U	U D U U	U D D U	U D D U	U D U U	U D D U
Shrubs							
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
plains pricklypear	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
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
skunkbush sumac	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 U D
smooth sumac	U U U U	U U U U	U U U U	D U D D	U U U U	U U U U	D U U U
yucca	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
Trees							
eastern redcedar	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
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

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 suggested initial stocking rates for cattle under continuous grazing (year long grazing or growing season long grazing) under normal growing conditions; however, *continuous grazing is not recommended.* These are conservative estimates that should be used only as guidelines in the initial stages of the conservation planning process. Often, the current plant composition does not entirely match any particular plant community (as described in this ecological site description). Because of this, a field visit is recommended, in all cases, to document plant composition and production. More precise carrying capacity estimates should eventually be calculated using the following stocking rate information along with animal preference data, 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/Sideoats Grama/Needlegrass	1700	0.47
Needleandthread/Little Bluestem/Grama	1400	0.38
Grama/Sedge, Bare Ground	1000	0.27
Eastern Redcedar/Ponderosa Pine	1200	**

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

Recreational Uses

This site provides hunting 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

No appreciable wood products are present on the site.

Other Products

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

Supporting Information

Associated Sites

(066XY032NE) – Sandy 18-22" P.Z.
(066XY036NE) – Loamy 18-22" P.Z.
(066XY059NE) – Thin Upland
(066XY054NE) – Sandy 22-26" P.Z.
(066XY058NE) – Loamy 22-26" P.Z.

Similar Sites

(066XY059NE) – Thin Upland [more little bluestem; more productive]

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.

Data Source	Number of Records	Sample Period	State	County
SCS-RANGE-417	8	1968 – 1983	NE	Brown, Keya Paha, Knox, Cherry
Ocular estimates	3	2002	NE, SD	Keya Paha, Todd

State Correlation

This site has been correlated with Nebraska and South Dakota in MLRA 66.

Field Offices	Counties	Field Offices	Counties
Ainsworth, NE	Brown, Keya Paha & Rock	O'Neill, NE	Holt
Bloomfield, NE	Knox	Spencer, NE	Boyd
Burke, SD	Gregory	Valentine, NE	Cherry
Martin, SD	Bennett & Shannon	White River, SD	Mellette, Todd
Neligh, NE	Antelope	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

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