

United States Department of Agriculture Natural Resources Conservation Service

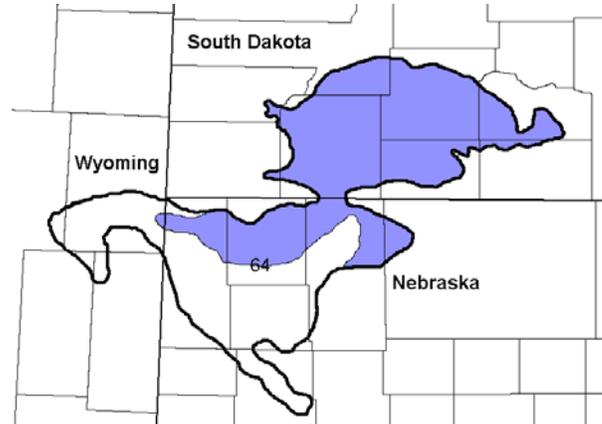
Ecological Site Description

Site Type: Rangeland

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

Site ID: R064XY036NE

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



Physiographic Features

This site occurs on gently undulating to moderately steep rolling plains and low hills.

Landform: alluvial fan, plain, hill

Aspect: N/A

	<u>Minimum</u>	<u>Maximum</u>
Elevation (feet):	2900	4000
Slope (percent):	0	30
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:	Negligible	Medium

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 very fine sandy loam to silt 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 soft siltstone, sandstone or alluvium. The surface layer is 4 to 15 inches thick. The texture of the subsurface layers ranges from loamy very fine sand to clay loam. 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. 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: alluvium, colluvium, residuum, loess
Parent Material Origin: sandstone, siltstone, limestone
Surface Texture: very fine sandy loam, loam, silt loam
Surface Texture Modifier: none
Subsurface Texture Group: loamy
Surface Fragments ≤ 3" (% Cover): 0
Surface Fragments > 3" (%Cover): 0
Subsurface Fragments ≤ 3" (% Volume): 0-30
Subsurface Fragments > 3" (% Volume): 0-15

	<u>Minimum</u>	<u>Maximum</u>
Drainage Class	well	somewhat excessively
Permeability Class:	moderately slow	moderate
Depth to Bedrock (inches):	20	80
Electrical Conductivity (mmhos/cm)*:	0	4
Sodium Absorption Ratio*:	0	5
Soil Reaction (1:1 Water)*:	6.1	9.0
Soil Reaction (0.1M CaCl₂)*:	NA	NA
Available Water Capacity (inches)*:	5	8
Calcium Carbonate Equivalent (percent)*:	0	15

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

Plant Communities

Ecological Dynamics of the Site:

This site developed under Northern Great Plains climatic conditions, 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. Encroachment of ponderosa pine, Rocky Mountain juniper and eastern red cedar may occur from associated sites, and can shift site characteristics. These shifts can alter the site dynamics and potential. These species may occur in small amounts on several plant communities.

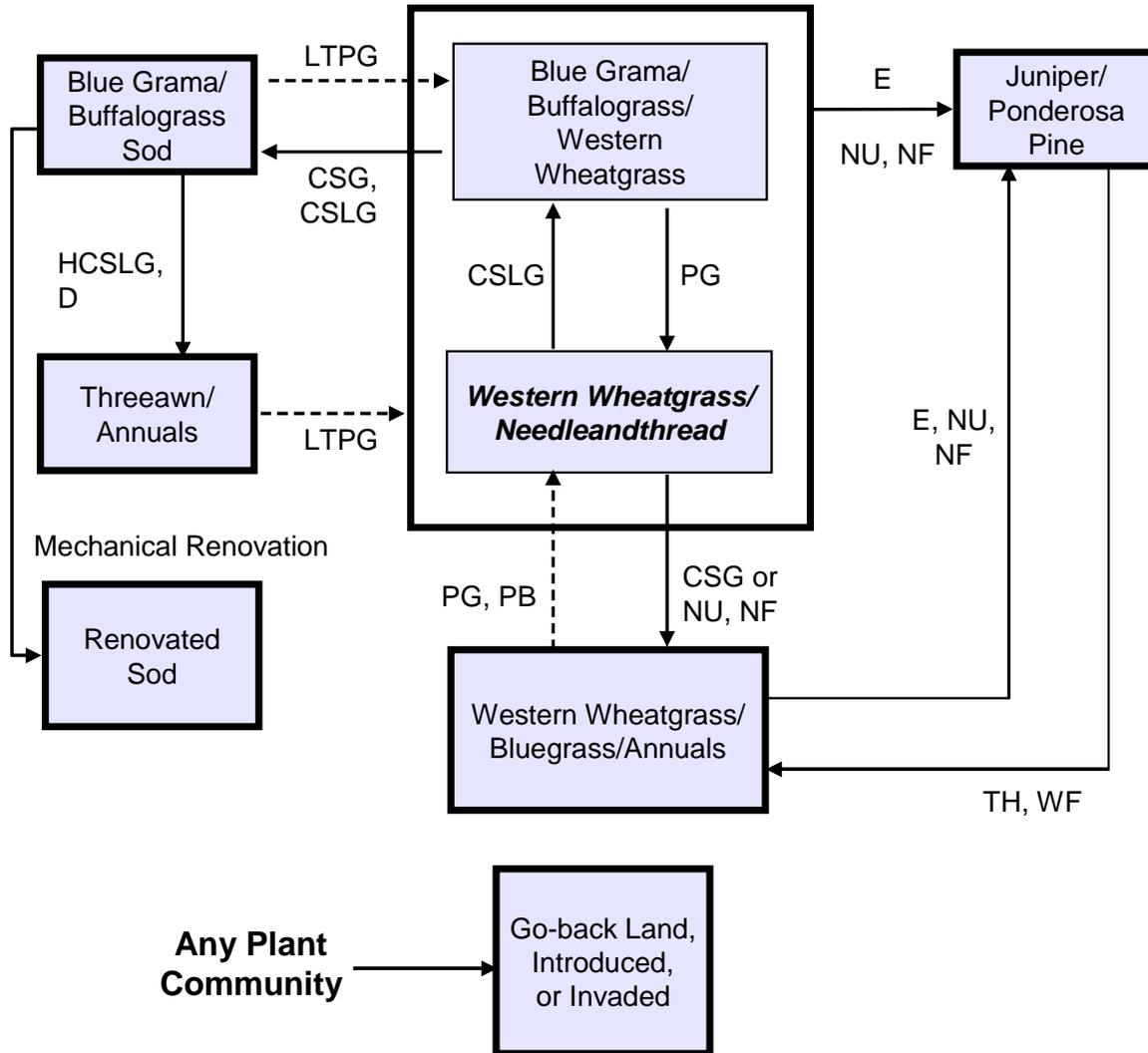
Continuous season-long grazing (during the typical growing season of May through October) and/or repeated seasonal grazing (e.g., every spring, every summer) without adequate recovery periods following each grazing occurrence causes this site to depart from the Western Wheatgrass/Needleandthread Plant Community. Blue grama and buffalograss will increase and eventually develop into a sod. Western wheatgrass will increase initially and then begin to decrease.

Needleandthread, green needlegrass, sideoats grama and big bluestem will decrease in frequency and production. Excessive defoliation can cause threeawns and annuals to increase and dominate the site. Extended periods of non-use and/or lack of fire or continuous seasonal grazing will result in a plant community dominated by cool season grasses such as western wheatgrass, bluegrass and annual brome.

Interpretations are primarily based on the Western Wheatgrass/Needleandthread 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



CSG - Continuous seasonal grazing (grazing a unit for an entire portion of a growing season, and the same season every year); **CSLG** - Continuous season-long grazing (grazing a unit for an entire growing season); **D** - Defoliation (rodents, insects, etc.); **E** – Encroachment or Escaped; **HCSLG** - Heavy continuous season-long grazing; **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	Western Wheatgrass/ Needleandthread			Blue Grama/Bufalograss/ Western Wheatgrass			Blue Grama/Bufalograss Sod		
		Grp	lbs./acre	% Comp	Grp	lbs./acre	% Comp	Grp	lbs./acre	% Comp
GRASSES & GRASS-LIKES			2040 - 2280	85 - 95		1280 - 1520	80 - 95		600 - 720	75 - 90
western wheatgrass	PASM	1	480 - 720	20 - 30	1	80 - 320	5 - 20	1	8 - 32	1 - 4
NEEDLEGRASSES		2	360 - 600	15 - 25	2	32 - 160	2 - 10	2	0 - 16	0 - 2
needleandthread	HECOC8	2	360 - 600	15 - 25	2	32 - 128	2 - 8	2	0 - 16	0 - 2
green needlegrass	NAV14	2	0 - 120	0 - 5	2	0 - 80	0 - 5			
WARM-SEASON SHORT GRASSES		3	120 - 240	5 - 10	3	320 - 640	20 - 40	3	320 - 520	40 - 65
blue grama	BOGR2	3	120 - 240	5 - 10	3	160 - 480	10 - 30	3	160 - 400	20 - 50
bufalograss	BUDA	3	0 - 48	0 - 2	3	160 - 480	10 - 30	3	160 - 400	20 - 50
NATIVE GRASSES & GRASS-LIKES		4	120 - 600	5 - 25	4	80 - 320	5 - 20	4	80 - 160	10 - 20
little bluestem	SCSC	4	0 - 120	0 - 5	4	0 - 48	0 - 3	4	0 - 16	0 - 2
sideoats grama	BOCU	4	120 - 240	5 - 10	4	16 - 80	1 - 5	4	0 - 24	0 - 3
big bluestem	ANGE	4	0 - 120	0 - 5	4	0 - 48	0 - 3			
sedge	CAREX	4	48 - 168	2 - 7	4	80 - 160	5 - 10	4	40 - 120	5 - 15
Scribner panicum	DIOLS	4	0 - 24	0 - 1	4	0 - 16	0 - 1			
dropseed	SPORO	4	0 - 24	0 - 1	4	0 - 48	0 - 3	4	0 - 16	0 - 2
plains muhly	MUCU3	4	0 - 24	0 - 1						
prairie junegrass	KOMA	4	0 - 48	0 - 2	4	0 - 48	0 - 3	4	8 - 32	1 - 4
threawn	ARIST				4	0 - 32	0 - 2	4	16 - 40	2 - 5
Canada wildrye	ELCA4									
sbweeks fescue	VUOC				4	0 - 16	0 - 1	4	0 - 16	0 - 2
other perennial grasses	ZGP	4	0 - 120	0 - 5	4	0 - 80	0 - 5	4	0 - 40	0 - 5
NON-NATIVE GRASSES		5			5	0 - 160	0 - 10	5	16 - 64	2 - 8
cheatgrass	BRTE				5	0 - 80	0 - 5	5	8 - 40	1 - 5
bluegrass	POA				5	0 - 80	0 - 5	5	0 - 40	0 - 5
FORBS		6	120 - 360	5 - 15	6	80 - 240	5 - 15	6	40 - 160	5 - 20
cudweed sagewort	ARLU	6	24 - 72	1 - 3	6	16 - 48	1 - 3	6	8 - 24	1 - 3
curlycup gumweed	GRSQ				6	0 - 48	0 - 3	6	8 - 24	1 - 3
deathcamas	ZIGAD				6	0 - 16	0 - 1	6	8 - 24	1 - 3
dotted gayfeather	LIPU	6	0 - 24	0 - 1	6	0 - 16	0 - 1	6	0 - 8	0 - 1
false boneset	BREU	6	0 - 24	0 - 1	6	0 - 16	0 - 1	6	0 - 8	0 - 1
false gromwell	ONMO	6	0 - 24	0 - 1	6	0 - 16	0 - 1			
fetid marigold	DYPA							6	0 - 8	0 - 1
fringed sagewort	ARFR4	6	0 - 72	0 - 3	6	16 - 48	1 - 3	6	8 - 24	1 - 3
goldenrod	SOLID	6	24 - 48	1 - 2	6	0 - 32	0 - 2	6	0 - 16	0 - 2
green sagewort	ARDR4	6	0 - 48	0 - 2	6	16 - 32	1 - 2	6	8 - 24	1 - 3
gromwell	BUAR3	6	0 - 24	0 - 1	6	0 - 16	0 - 1	6	0 - 8	0 - 1
heath aster	SYER	6	0 - 24	0 - 1	6	0 - 32	0 - 2	6	0 - 8	0 - 1
marestail	COCA5				6	0 - 16	0 - 1	6	0 - 16	0 - 2
milkvetch	ASTRA	6	0 - 24	0 - 1	6	0 - 16	0 - 1	6	0 - 16	0 - 2
mullein	VERBA				6	0 - 16	0 - 1	6	0 - 8	0 - 1
penstemon	PENST	6	0 - 24	0 - 1	6	0 - 16	0 - 1	6	0 - 8	0 - 1
prairie coneflower	RACO3	6	0 - 48	0 - 2	6	0 - 32	0 - 2	6	0 - 16	0 - 2
purple coneflower	ECA2	6	0 - 24	0 - 1	6	0 - 16	0 - 1			
pussytoes	ANTEN	6	0 - 48	0 - 2	6	16 - 32	1 - 2	6	0 - 16	0 - 2
salsify	TRAGO				6	16 - 48	1 - 3	6	8 - 24	1 - 3
scarlet globemallow	SPCO	6	0 - 48	0 - 2	6	16 - 32	1 - 2	6	8 - 16	1 - 2
scurfpea	PSORA2	6	24 - 120	1 - 5	6	16 - 80	1 - 5	6	8 - 24	1 - 3
spiderwort	TRADE	6	0 - 48	0 - 2	6	0 - 16	0 - 1	6	0 - 8	0 - 1
sweetclover	MELIL				6	0 - 80	0 - 5	6	0 - 40	0 - 5
textile onion	ALTE	6	0 - 24	0 - 1	6	0 - 16	0 - 1	6	0 - 16	0 - 2
thistle	CIRSI	6	0 - 24	0 - 1	6	0 - 32	0 - 2	6	0 - 24	0 - 3
verbena	VERBE	6	0 - 48	0 - 2	6	16 - 48	1 - 3	6	8 - 24	1 - 3
vetch	VICIA	6	24 - 72	1 - 3	6	16 - 48	1 - 3	6	8 - 24	1 - 3
western ragweed	AMPS	6	24 - 72	1 - 3	6	16 - 48	1 - 3	6	8 - 40	1 - 5
wild parsley	MUDI	6	0 - 24	0 - 1	6	0 - 16	0 - 1			
other annual forbs	ZFA	6	0 - 24	0 - 1	6	0 - 48	0 - 3	6	0 - 40	0 - 5
other perennial forbs	ZFP	6	0 - 120	0 - 5	6	0 - 80	0 - 5	6	0 - 40	0 - 5
SHRUBS		7	24 - 120	1 - 5	7	16 - 80	1 - 5	7	0 - 40	0 - 5
broom snakeweed	GUSA2	7	0 - 24	0 - 1	7	0 - 48	0 - 3	7	8 - 24	1 - 3
cactus	OPUNT	7	0 - 24	0 - 1	7	0 - 16	0 - 1	7	8 - 24	1 - 3
currant	RIBES									
leadplant	AMCA6	7	0 - 120	0 - 5	7	0 - 48	0 - 3			
rose	ROSA5	7	0 - 72	0 - 3	7	16 - 48	1 - 3	7	0 - 24	0 - 3
skunkbush sumac	RHTR									
snowberry	SYMPH	7	24 - 120	1 - 5	7	16 - 80	1 - 5	7	0 - 40	0 - 5
other shrubs	ZSHRUB	7	0 - 72	0 - 3	7	0 - 48	0 - 3	7	0 - 16	0 - 2
TREES		8			8			8		
juniper	JUNIP									
ponderosa pine	PIPO									
Annual Production lbs./acre			LOW RV HIGH		LOW RV HIGH		LOW RV HIGH		LOW RV HIGH	
GRASSES & GRASS-LIKES			1365 - 2088 - 3000		1110 - 1392 - 1665		465 - 680 - 890			
FORBS			115 - 240 - 375		75 - 160 - 250		35 - 100 - 165			
SHRUBS			20 - 72 - 125		15 - 48 - 85		0 - 20 - 45			
TREES										
TOTAL			1500 - 2400 - 3500		1200 - 1600 - 2000		500 - 800 - 1100			

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 Composition and Group Annual Production

COMMON/GROUP NAME	SYMBOL	Western Wheatgrass/ Bluegrass/Annuals			Juniper/Ponderosa Pine			Threeawn/Annuals		
		Grp	lbs./acre	% Comp	Grp	lbs./acre	% Comp	Grp	lbs./acre	% Comp
GRASSES & GRASS-LIKES			1275 - 1615	75 - 95		400 - 560	50 - 70		420 - 595	60 - 85
western wheatgrass	PASM	1	170 - 850	10 - 50	1	16 - 80	2 - 10	1	0 - 35	0 - 5
NEEDLEGRASSES		2	17 - 255	1 - 15	2	32 - 96	4 - 12	2		
needleandthread	HECOC8	2	17 - 170	1 - 10	2	16 - 64	2 - 8			
green needlegrass	NAVI4	2	0 - 102	0 - 6	2	16 - 64	2 - 8			
WARM-SEASON SHORT GRASSES		3	0 - 170	0 - 10	3	8 - 40	1 - 5	3	0 - 35	0 - 5
blue grama	BOGR2	3	0 - 136	0 - 8	3	8 - 24	1 - 3	3	0 - 21	0 - 3
buffalograss	BUDA	3	0 - 85	0 - 5	3	0 - 16	0 - 2	3	0 - 14	0 - 2
NATIVE GRASSES & GRASS-LIKES		4	170 - 510	10 - 30	4	240 - 520	30 - 65	4	280 - 525	40 - 75
little bluestem	SCSC	4	0 - 51	0 - 3	4	16 - 80	2 - 10	4	0 - 7	0 - 1
sideoats grama	BOCU	4	0 - 85	0 - 5	4	8 - 40	1 - 5			
big bluestem	ANGE	4	0 - 34	0 - 2	4	8 - 80	1 - 10			
sedge	CAREX	4	34 - 170	2 - 10	4	40 - 80	5 - 10	4	0 - 14	0 - 2
Scribner panicum	DIOLS				4	0 - 24	0 - 3	4	0 - 21	0 - 3
dropseed	SPORO	4	0 - 85	0 - 5	4	0 - 24	0 - 3			
plains muhly	MUCU3				4	0 - 16	0 - 2			
prairie junegrass	KOMA	4	17 - 85	1 - 5	4	16 - 56	2 - 7			
threeawn	ARIST	4	17 - 85	1 - 5	4	16 - 64	2 - 8	4	350 - 490	50 - 70
Canada wildrye	ELCA4				4	16 - 120	2 - 15			
sixweeks fescue	VUOC	4	0 - 34	0 - 2				4	0 - 7	0 - 1
other perennial grasses	2GP	4	0 - 85	0 - 5	4	8 - 40	1 - 5	4	0 - 14	0 - 2
NON-NATIVE GRASSES		5	255 - 850	15 - 50	5	40 - 160	5 - 20	5	21 - 105	3 - 15
cheatgrass	BRTE	5	85 - 510	5 - 30	5	8 - 40	1 - 5	5	21 - 105	3 - 15
bluegrass	POA	5	170 - 850	10 - 50	5	40 - 120	5 - 15			
FORBS		6	34 - 255	2 - 15	6	40 - 80	5 - 10	6	105 - 245	15 - 35
cudweed sagewort	ARLU	6	17 - 51	1 - 3	6	8 - 24	1 - 3	6	0 - 7	0 - 1
curlycup gumweed	GRSQ	6	0 - 51	0 - 3				6	0 - 7	0 - 1
deathcarnas	ZIGAD	6	17 - 51	1 - 3				6	0 - 35	0 - 5
dotted gayfeather	LIPU	6	0 - 17	0 - 1	6	0 - 16	0 - 2			
false boneset	BREU	6	0 - 17	0 - 1	6	0 - 8	0 - 1			
false gromwell	ONMO	6	0 - 34	0 - 2	6	0 - 16	0 - 2			
fetid marigold	DYPA							6	14 - 56	2 - 8
fringed sagewort	ARFR4	6	17 - 51	1 - 3	6	0 - 24	0 - 3	6	35 - 105	5 - 15
goldenrod	SOLID	6	0 - 34	0 - 2	6	0 - 24	0 - 3			
green sagewort	ARDR4	6	17 - 51	1 - 3				6	0 - 7	0 - 1
gromwell	BUAR3	6	0 - 17	0 - 1						
heath aster	SYER	6	0 - 34	0 - 2	6	0 - 8	0 - 1			
marestail	COCA5	6	0 - 34	0 - 2						
milkvetch	ASTRA				6	0 - 8	0 - 1	6	0 - 7	0 - 1
mullein	VERBA	6	0 - 34	0 - 2						
penstemon	PENST	6	0 - 17	0 - 1	6	0 - 24	0 - 3			
prairie coneflower	RAC03	6	0 - 34	0 - 2	6	0 - 8	0 - 1			
purple coneflower	ECAN2	6	0 - 17	0 - 1	6	0 - 8	0 - 1			
pussytoes	ANTEN	6	0 - 34	0 - 2	6	8 - 16	1 - 2	6	0 - 35	0 - 5
salsify	TRAGO	6	17 - 51	1 - 3	6	0 - 24	0 - 3			
scarlet globemallow	SPOC	6	0 - 34	0 - 2						
scurfpea	PSORA2	6	17 - 51	1 - 3	6	0 - 16	0 - 2			
spiderwort	TRADE	6	0 - 34	0 - 2	6	0 - 16	0 - 2			
sweetclover	MELIL	6	0 - 85	0 - 5						
textile onion	ALTE	6	17 - 51	1 - 3	6	0 - 8	0 - 1	6	0 - 21	0 - 3
thistle	CIRSI	6	0 - 51	0 - 3	6	0 - 8	0 - 1	6	0 - 140	0 - 20
verbena	VERBE	6	17 - 85	1 - 5	6	8 - 24	1 - 3	6	7 - 70	1 - 10
vetch	VICIA	6	0 - 51	0 - 3	6	0 - 16	0 - 2			
western ragweed	AMPS	6	17 - 170	1 - 10	6	8 - 24	1 - 3	6	0 - 21	0 - 3
wild parsley	MUDI	6	0 - 34	0 - 2	6	0 - 8	0 - 1			
other annual forbs	2FA	6	0 - 85	0 - 5	6	0 - 24	0 - 3	6	0 - 35	0 - 5
other perennial forbs	2FP	6	0 - 85	0 - 5	6	0 - 24	0 - 3	6	0 - 35	0 - 5
SHRUBS		7	0 - 85	0 - 5	7	40 - 160	5 - 20	7	14 - 70	2 - 10
broom snakeweed	GUSA2	7	0 - 34	0 - 2				7	7 - 70	1 - 10
cactus	OPUNT	7	0 - 17	0 - 1				7	7 - 70	1 - 10
currant	RIBES				7	0 - 40	0 - 5			
leadplant	AMCA6				7	0 - 16	0 - 2			
rose	ROSA5	7	0 - 51	0 - 3	7	8 - 40	1 - 5			
skunkbush sumac	RHTR				7	0 - 16	0 - 2			
snowberry	SYMPH	7	17 - 85	1 - 5	7	16 - 40	2 - 5			
other shrubs	2SHRUB	7	0 - 51	0 - 3	7	0 - 24	0 - 3			
TREES		8	0 - 51	0 - 3	8	80 - 160	10 - 20	8		
juniper	JUNIP	8	0 - 51	0 - 3	8	80 - 160	10 - 20			
ponderosa pine	PIPO	8	0 - 51	0 - 3	8	80 - 160	10 - 20			
Annual Production lbs./acre			LOW RV HIGH		LOW RV HIGH		LOW RV HIGH			
GRASSES & GRASS-LIKES			770 - 1488 - 1880		355 - 520 - 685		290 - 483 - 675			
FORBS			30 - 145 - 275		35 - 60 - 85		100 - 175 - 250			
SHRUBS			0 - 43 - 90		35 - 100 - 165		10 - 42 - 75			
TREES			0 - 26 - 55		75 - 120 - 165					
TOTAL			800 - 1700 - 2300		500 - 800 - 1100		400 - 700 - 1000			

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.

Western Wheatgrass/Needleandthread Plant Community

Interpretations are based primarily on the Western Wheatgrass/Needleandthread Plant Community (this is also considered to be climax). 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% grasses or grass-like plants, 15% forbs, and 5% shrubs. Cool season grasses dominate the plant community. The major grasses include western wheatgrass and needleandthread. Other grasses occurring on the site include green needlegrass, blue grama, little bluestem, sideoats grama and sedge. Significant forbs include vetch, cudweed sagewort, scurfpea, western ragweed, and goldenrod. The significant shrub that occurs in patchy mosaics is western snowberry. Other shrubs include rose, leadplant and broom snakeweed.

This plant community is well adapted to the Northern Great Plains climatic conditions. Individual species can vary greatly in production depending on growing conditions (timing and amount of precipitation and temperature). Plant litter is properly distributed with some movement off-site and natural plant mortality is low. The diversity in plant species allows for high drought tolerance. Moderate or high available water capacity provides a favorable soil-water-plant relationship.

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: NE6401

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

Growth curve description: Cool-season dominant.

JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
0	0	5	15	28	30	10	2	5	5	0	0

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

- Continuous season-long grazing will lead to a *Blue Grama/Buffalograss/Western Wheatgrass Plant Community*.
- Continuous seasonal grazing, or nonuse and no fire for extended periods will lead to the *Western Wheatgrass/Bluegrass/Annuals Plant Community*.
- Encroachment (or escaped), nonuse, and no fire will lead to a *Juniper/Ponderosa Pine Plant Community*. This occurs when this plant community is protected from natural fires, or controlled burning. Nonuse tends to accumulate litter resulting in a greater space between individual plants, allowing places for tree seedlings to get a start. Juniper will tend to escape from wildlife plantings and/or shelterbelts.

Blue Grama/Buffalograss/Western Wheatgrass Plant Community

This plant community develops under continuous seasonal grazing (i.e., grazing an area during the same season every year) or from over utilization during extended drought periods. The potential vegetation is made up of approximately 80% grasses and grass-like species, 15% forbs and 5% shrubs. The dominant grasses include blue grama, buffalograss, western wheatgrass, and threadleaf sedge. Other grasses may include needleandthread, sideoats grama, prairie junegrass, red threeawn, bluegrass, little bluestem and big bluestem. The dominant forbs include scurfpeas, western ragweed, sagewort, scarlet globemallow, and other perennial aster species. Dominant shrubs in this community include western snowberry and wild rose. Broom snakeweed may also be present in significant amounts. Compared to the Western Wheatgrass/Needleandthread Plant Community, the shortgrass species including blue grama and buffalograss have increased. The cool season species including western wheatgrass and needlegrasses have decreased in composition. Annual bromes, wooly Indianwheat, and other annual grasses and forbs can invade the site. While plant diversity is relatively high, the structure of the community is dominated by shortgrasses.

This plant community is resistant to change. The dominant herbaceous species are very adapted to grazing; however, the mid to tall grass species and the more palatable forbs will decrease in the community through long-term overgrazing. Soil erosion is low to moderate. Because of the sod forming habit of the dominant shortgrass species, water infiltration is low, and runoff is moderate to high. Typically the runoff is very clean because of the low potential for soil erosion.

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:

- With prescribed grazing, and favorable climatic conditions this plant community will move towards the *Western Wheatgrass/Needleandthread Plant Community*. Periods of non-use or deferment may be a management option to bring about this transition.
- With continuous seasonal grazing this plant community will move towards the *Blue Grama/Buffalograss Sod Plant Community*. This would be typical of calving/lambing pastures where the unit is continuously utilized during the late winter through mid spring. This transition will result in decreased forage production and plant species diversity. This transition can also occur with continuous season-long grazing at high utilization levels. A blue grama, buffalograss sod will require significant economic inputs (i.e., high animal impact, mechanical renovation, etc.) and time to move it back to the *Blue Grama/Buffalograss/Western Wheatgrass Plant Community*.
- Encroachment (or escaped), nonuse, no fire will lead to a *Juniper/Ponderosa Pine Plant Community*. This occurs when this plant community is protected from natural fires, or controlled burning. Nonuse of these sites tends to accumulate litter resulting in a greater space between individual plants, allowing places for tree seedlings to get a start. Juniper will tend to escape from wildlife plantings and/or shelterbelts.

Western Wheatgrass/Bluegrass/Annuals Plant Community

This plant community developed under repeated seasonal grazing (typically during the summer) or under extended periods of non-use and no fire where a heavy litter layer builds up that can favor cool season species and invasion of bluegrass, annual brome and other invaders. Initially, the dominant grasses include bluegrass, western wheatgrass, needleandthread, and green needlegrass. Other grasses may include blue grama, buffalograss, threeawn, and prairie junegrass. With continued seasonal grazing and/or non-use and no fire, the plant community becomes dominated by bluegrass, annual brome and other annual grasses and less palatable forbs. Sedges will flourish in the understory. The dominant forbs include western ragweed, scurpeas, cudweed sagewort, and verbenas. Dominant shrubs in this community include snowberry, rose, and plains pricklypear. Compared to the Western Wheatgrass/Needleandthread Plant Community, bluegrass increases significantly. Western wheatgrass and blue grama decrease in composition. Plant diversity declines.

This plant community is resistant to change, and if disturbed, it is resilient. Bluegrass will increase under grazing pressure. Cool, moist climatic conditions will also tend to increase bluegrass production. Soil erosion is low. Compared to the Western Wheatgrass/Needleandthread Plant Community, infiltration is reduced, and runoff increases. Once this plant community is reached, time and external resources will be needed to see any immediate recovery in the diversity.

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: NE6401

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

Growth curve description: Cool-season dominant.

JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
0	0	5	15	28	30	10	2	5	5	0	0

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

- With prescribed grazing, prescribed burning followed by prescribed grazing or other management practices (i.e., different livestock species/classes, management intensive grazing, etc.), this plant community may move toward the *Western Wheatgrass/Needleandthread Plant Community*. This would require long term prescribed grazing at moderate rates with favorable climatic conditions.
- Encroachment (or escaped), nonuse and no fire will lead to a *Juniper/Ponderosa Pine Plant Community*. This occurs when this plant community is protected from natural fires, or controlled burning. Nonuse causes litter to accumulate resulting in a greater space between individual plants, allowing places for tree seedlings to get a start. Juniper will tend to escape from wildlife plantings and/or shelterbelts.

Blue Grama/Buffalograss Sod Plant Community

This plant community is the result of heavy overuse and/or repeated seasonal grazing (typically in the spring or in the spring and fall). Blue grama and buffalograss are the dominant species with the balance being a few species of cool-season grasses, warm-season grasses and miscellaneous forbs. Some of the minor species are western wheatgrass, threeawn, sedges, needleandthread, prairie junegrass, sideoats grama, and annual brome. There are a few forbs such as western ragweed, cudweed sagewort, and scarlet globemallow. The dominant shrubs include broom snakeweed and cactus. There is usually less than 10% bare ground.

When compared to the Western Wheatgrass/Needleandthread Plant Community, blue grama and buffalograss have increased significantly. The mid to tall grasses have declined dramatically. Annual production has decreased significantly.

This plant community is resistant to change, as the dominant species are resistant to overgrazing. The thick sod prevents other species from getting established. This plant community has diminished potential for grazing use. Infiltration will decrease and runoff will increase. Soil erosion will be minimal due to the sod forming habit of blue grama and buffalograss. This could be advantageous for heavy use areas such as calving/lambing units since the grazing tolerant species will control erosion, and increase production to adjacent dams. However nutrient runoff could be a potential problem.

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:

- Long-term prescribed grazing (typically in mid-summer), will allow this plant community to return to the *Blue Grama/Buffalograss/Western Wheatgrass Plant Community* and eventually to the *Western Wheatgrass/Needleandthread Plant Community*, assuming an adequate seed/vegetative source is available.
- With heavy continuous season-long grazing, or severe defoliation, this plant community will move toward the *Threeawn/Annuals Plant Community*. Forage production, species diversity, and ground cover will decrease.
- Mechanical renovation (e.g., chiseling, contour furrowing, etc.) will move this plant community to the Renovated Sod Plant Community. This will be the fastest way to return to a productive plant community.

Threeawn/Annuals Plant Community

This plant community developed under continuous heavy grazing or other excessive disturbances (e.g., heavy use areas, defoliation by rodents, etc.). The potential plant community is made up of approximately 80% grasses and grass-like species and 15-20% forbs. The dominant grasses include threeawn, cheatgrass, and panicum species. Other grasses may include little bluestem, blue grama, buffalograss, sedges, western wheatgrass, and sixweeks fescue. The dominant forbs include fringed sagewort, fetid marigold, western ragweed, pussytoes, prostrate verbena and other invader-like species. Other plant species, from adjacent ecological sites, can become minor components of this plant community. This plant community is susceptible to invasion of Canada thistle and other non-native species because of the relatively high percent of bare ground. Compared to the Western Wheatgrass/Needleandthread Plant Community, red threeawn, annual brome grasses, and percent of bare ground has increased. Western wheatgrass, needlegrasses and other cool season grasses and grass-like species have decreased as have the warm season species including big bluestem, sideoats grama, blue grama and buffalograss. Plant diversity is low (plant richness may be high, but areas are often dominated by a few species and evenness is lacking).

This plant community is very resistant to change because of the loss of plant diversity and overall soil disturbance. Soil erosion is potentially very high because of the bare ground and shallow rooted herbaceous plant community. Water runoff is increased and infiltration is decreased. This plant community will require significant economic inputs and time to move towards another plant community. This movement is highly variable in its succession. This is due to the loss of diversity (including the loss of the seed bank), within the existing plant community, and on adjacent ecological sites. This community can be renovated to improve the production capability, however if management changes are not made, the vegetation could revert back to a threeawn/annual 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: 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:

- Under long-term prescribed grazing, including adequate rest periods, this plant community will move through the successional stages leading to the *Western Wheatgrass/Needleandthread Plant Community*. Depending on the slope, aspect, and size, and if adequate perennial plants exist, this change can occur more rapidly.

Juniper/Ponderosa Pine Plant Community

Historically, ponderosa pine was confined to ridges and steep shallow slopes located adjacent to this ecological site. Juniper encroachment is in relation to wildlife plantings, shelterbelts and natural sources. Currently, ponderosa pine and juniper expand onto this ecological site due to suppression of fire. Juniper/pine canopy is greater than 15% of mature trees. The understory production is made up of about 85% grasses and grass-like species, 10% forbs, and 5% shrubs. Dominant grasses include western wheatgrass, bluegrass, and needleandthread. Other grasses present are little bluestem, sideoats grama, green needlegrass, prairie junegrass, Canada wildrye and annual brome. Significant forbs include western ragweed, verbena, cudweed sagewort, fringed sagewort and pussytoes.

When compared to the Western Wheatgrass/Needleandthread Plant Community, ponderosa pine or juniper increases significantly. The grass component decreases dramatically. Annual production also decreases significantly. While the juniper/pine canopy provides excellent protection for livestock and wildlife, the understory supports fewer numbers of wildlife and livestock due to decreased production.

This vegetation state is resistant to change. A significant reduction of juniper/pine can only be accomplished through timber harvest or crown fire. The vegetation in the understory is capable of enduring fire; however, very hot crown fires will also have a detrimental effect to the herbaceous plant community. The result may be a plant community more similar to a Go-back land situation rather than the Western Wheatgrass/Bluegrass/Annuals 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 shows the estimated monthly percentages of total annual growth of the dominant species 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:

- Wildfire or prescribed burning (hot, crown fires) will move this plant community to the *Western Wheatgrass/Bluegrass/Annuals Plant Community*.
- Removal of juniper/pine by timber harvest combined with prescribed burning will allow the understory to develop and convert to the *Western Wheatgrass/Bluegrass/Annuals Plant Community*.

Renovated Sod Vegetation State

An altered vegetation community can be achieved through mechanical renovation. Renovation creates microrelief that alters the water cycle by increasing infiltration and decreasing runoff. The renovation reduces the sod-bound conditions, increasing the vegetative production potential. These factors favor cool season species such as western wheatgrass, needleandthread, and a variety of forbs. With proper management after renovation, this plant community could have similar plant composition and growth curve characteristics as the Western Wheatgrass/Needleandthread Plant Community (if sufficient amounts of the native perennial species are present). However, the production could be higher, depending on the degree of alteration. Proper grazing management must be implemented to maintain this plant community.

If this plant community is subjected to excessive disturbance after renovation (i.e., heavy continuous seasonal or season-long grazing, excessive defoliation, etc.), the plant community will be similar to the Blue Grama/Buffalograss Sod Plant Community in most respects. The main difference is the microrelief created by the renovation.

The most common types of renovation are disking, chiseling, and interseeding. Typically these sod communities formed under continuous season-long, continuous seasonal grazing, or non-use and no fire. In MLRA 64, most landowners farm these areas before replanting them to permanent vegetation. Disking or chiseling can encourage the establishment of rhizomatous species (e.g., western wheatgrass, bluegrass, etc.) if an adequate seed source is present. Forbs such as cudweed sagewort, verbena, and western ragweed will also move into the area. Production after renovation can be 1500-2500 pounds per acre (air-dry weight) annually, depending on growing conditions.

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. Vegetation 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 include western wheatgrass, deathcamas, prickly lettuce, marehail, 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

MLRA 64 lies within the drier portion of northern mixed-grass prairie ecosystem where sagebrush steppes to the west yield to grassland steppes to the east. Prior to European settlement, this area consisted of diverse grass/shrub land habitats interspersed with varying densities of depressional, instream wetlands, and woody riparian corridors. These habitats provided critical life cycle components for many of its users. Many species of grassland birds, small mammals, reptiles, amphibians, and herds of roaming bison, elk, and pronghorn were among the inhabitants adapted to this semi-arid region. Roaming herbivores, as well as, several small mammal and insect species, were the primary consumers linking the grassland resources to predators such as the wolf, mountain lion, and grizzly bear, as well as, smaller carnivores such as the coyote, bobcat, fox, and raptors. The prairie dog was once abundant; however, the species remains a keystone species within its range. The black-footed ferret, burrowing owl, ferruginous hawk, mountain plover, and swift fox were associated with prairie dog complexes.

Historically, the northern mixed-grass prairie was a disturbance-driven ecosystem with fire, herbivory, and climate functioning as the primary disturbance factors either singly or in combination. Following European settlement, livestock grazing, cropland conversion, elimination of fire, energy development, and other anthropogenic factors influenced species composition and abundance. Introduced and invasive species further impacted plant and animal communities. The bison was a historical keystone species but have been extirpated as a free-ranging herbivore. The loss of the bison and reduction of prairie dog populations, and fire as ecological drivers, greatly influenced the character of the remaining native plant communities and altered wildlife habitats. Human development has reduced habitat quality for area-sensitive species.

Within MLRA 64, the Loamy 17-20" P.Z. ES provides upland grassland cover with an associated forb, shrub, and tree component. It was typically part of an expansive grassland landscape that included combinations of Badlands, Thin Breaks, Clayey, Claypan, Dense Clay, Loamy, Saline, Sandy, Shallow, Overflow, Subirrigated, and Terrace ESs. This site provided habitat for species requiring unfragmented grassland. Important habitat features and components found commonly or exclusively on this site may include sharp-tailed grouse leks; upland nesting habitat for grassland birds, forbs, and insects for brood habitat; and a forage source for small and large herbivores. Many grassland and shrub steppe nesting bird populations are declining. Extirpated species include free-ranging American bison, grizzly bear, gray wolf, black-footed ferret, mountain plover, Rocky Mountain locust, and swift fox.

The majority of the Loamy 17-20" P.Z. ES remains intact and provides increasingly important habitat for grassland and shrub steppe nesting birds, small rodents, coyote, and a variety of reptiles, amphibians, and insects. Invasive species such as annual brome grasses and cheatgrass have impacted the biological integrity of the site for some grassland birds. Changes in historic fire regime and domestic grazing have impacted the forb/shrub/grass percentages.

Western Wheatgrass/Needleandthread (HCPC): The predominance of grasses plus high diversity of forbs in this community favors grazers and mixed-feeders such as pronghorn. Insects, such as pollinators, play a large role in maintaining the forb community and provide a forage base for grassland birds and other species. The complex plant structural diversity provides habitat for a wide array of migratory and resident birds. Grasshopper sparrow, savannah sparrow, lark bunting, western meadowlark, and sharp-tailed grouse are common and benefit from the structure and composition this plant community provides. This site provides important breeding habitat for the loggerhead shrike. This site provides excellent nesting and brood rearing habitat for sharp-tailed grouse.

Diverse prey populations are available for grassland raptors such as ferruginous hawk, Swainson's hawk, golden eagle, and prairie falcon.

The diversity of grasses and forbs provide high nutrition levels for small and large herbivores including voles, mice, least chipmunk, spotted ground squirrel, desert cottontail rabbit, white-tailed and black-tailed jackrabbit, and deer. This ES provides excellent wintering habitat for pronghorn. The moderate stature of this plant community provides suitable thermal, protective, and escape cover for small herbivores and grassland birds. Predators utilizing this plant community include coyote, American badger, red fox, and long-tailed weasel. This plant community provides habitat for spade foot toad and Great Plains toads. Prey abundance and shade opportunities may attract multiple reptile species such as gopher snake, milk snake, prairie rattlesnake, and western ornate box turtle to this site along with lesser numbers of various lizard species.

Blue Grama/Buffalograss/Western Wheatgrass: Resulting from continuous season-long grazing or from overutilization during extended drought periods, blue grama and buffalograss will become dominate. Forb diversity increases but shrub diversity and abundance remain relatively unchanged. Density of species such as sharp-tail grouse and desert cottontail should remain unchanged. However, the shift to shorter plant structure will favor prairie dog expansion and associate species such as ferruginous hawk, burrowing owl, tiger salamander, and swift fox. Species such as the horned lark, long-billed curlew, upland sandpiper, and white-tailed and black-tailed jackrabbit, will increase. This plant community may provide areas suitable for sharp-tailed grouse lek site development. The short stature of this plant community limits thermal, protective, and escape cover. Predators utilizing this plant community include the coyote, American badger, red fox, and long-tailed weasel.

Western Wheatgrass/Bluegrass/Annuals: Resulting from continuous seasonal grazing or nonuse or no fire, western wheatgrass, bluegrass, and annuals will dominate. The forb diversity has increased; however, while forb abundance declines. Both shrub diversity and abundance remains relatively unchanged. A grass diversity shift to favor invasive species and excessive litter buildup substantially diminishes wildlife habitat quality for grassland nesting songbirds. Scattered juniper and ponderosa pine provide habitat for various small mammals and songbirds when present on the site.

A shift to shorter plant structure will favor prairie dog expansion and associate species such as ferruginous hawk, burrowing owl, tiger salamander, and swift fox. Species such as the horned lark, long-billed curlew, upland sandpiper, and white-tailed jackrabbit will increase. This plant community may provide areas suitable for sharp-tailed grouse lek site development.

The short stature of this plant community limits thermal, protective, and escape cover. Predators utilizing this plant community include the coyote, American badger, red fox, and long-tailed weasel.

Juniper/Ponderosa Pine: Resulting from no fire, nonuse, and/or encroachment, juniper and Ponderosa pine will expand from wildlife plantings, shelterbelts, and natural sources such as ridges and steep shallow slopes. Forb diversity has decreased while shrub abundance has increased. Juniper and Ponderosa pine increase significantly. Grass species decline dramatically and species composition shifts and can become dominated by invasive species. Juniper and Ponderosa pine stands provide nesting cover, escape cover, and den sites for a variety of species. Species such as mule deer, white-footed mice, bushy-tailed woodrat, black-billed magpie, Townsend's solitaire, western meadowlark, Bohemian waxwing, dark-eyed junco, brown thrasher, lark sparrow, and white-crowned sparrow will increase. Species such as meadow voles, spotted ground squirrel, thirteen-lined ground squirrel, northern grasshopper mice, and western harvest mice will not utilize this site. Grassland nesting songbirds will be significantly reduced. Raptors such as the long-eared owl will increase.

If the tree canopy is high enough, then bare ground will likely increase and excessive runoff, nutrient, and sediment loads may impact offsite aquatic habitat.

Blue Grama/Buffalograss Sod: This plant community develops under continuous season-long grazing or continuous seasonal grazing with concentrated use in the spring. Forb abundance increases while both forb and shrub diversity declines. A shift to short plant structure will favor prairie dog expansion with prairie dog town sites and associate species such as ferruginous hawk, burrowing owl, tiger salamander, and swift fox. Species such as the horned lark, long-billed curlew, upland sandpiper, and white-tailed and black-tailed jackrabbit will increase. This plant community may provide areas suitable for sharp-tailed grouse lek site development. The short stature of this plant community limits thermal, protective, and escape cover. Predators utilizing this plant community include the coyote, American badger, red fox, and long-tailed weasel. Species, such as the desert cottontail, will rarely use this site.

Extreme impairment of the ecological processes impacts offsite aquatic habitats through excessive runoff and nutrient loads. Elevated surface temperatures resulting from reduced cover and litter will greatly reduce habitat for most amphibian species, grassland birds, and mammals.

Blue Grama/Buffalograss Sod (Renovated): See the description under the Blue Grama/Buffalograss Sod Plant Community.

Threeawn/Annuals: Resulting from heavy continuous season-long grazing over many years or frequent and severe defoliation, threeawn and annuals will dominate. The forb and shrub abundance has increased; however, diversity has substantially decreased. A shift to short plant structure and relatively high percent of bare ground will favor prairie dog expansion with prairie dog town sites and associate species such as swift fox, ferruginous hawk and burrowing owl. Species such as horned lark, long-billed curlew, upland sandpiper, and white-tailed jackrabbit will increase. Species such as desert cottontail and grassland nesting birds requiring moderate cover height will rarely use this site.

The short stature of this plant community limits suitable thermal, protective, and escape cover. Prey populations are reduced and are more vulnerable to raptor and mammalian predation. Predators utilizing this plant community include the coyote, American badger, red fox, and long-tailed weasel.

Extreme impairment of the ecological processes impacts offsite aquatic habitats through excessive runoff, nutrient, and sediment loads. Elevated surface temperatures resulting from reduced cover and litter will greatly reduce habitat for most amphibian species, grassland birds, and mammals.

Go-back, Introduced, and/or Invaded States

This group includes separate vegetation states that are highly variable in nature. They are derived through distinct management scenarios. These plant communities have been or are highly susceptible to invasion of annual bromegrasses, bluegrasses, crested wheatgrass, and other nonnative species.

Since secondary succession is highly variable plant and wildlife species will vary. This plant community provides habitat for generalist or early successional species. In addition, these communities may contain prairie dog towns.

The **Go-back** state can be reached whenever severe mechanical disturbance (i.e., abandoned farmland) is eliminated. Early successional plant communities include annual and perennial weedy type species first to occupy the site. These sites provide diverse foraging, reproductive, and escape cover favoring multiple edge species. This pioneer plant community provides abundant opportunity for insect, bird, and small mammal foraging due to abundant flowers and seed sources.

Site Type: Rangeland
MLRA: 64 – Mixed Sandy and Silty Tableland

**Loamy 17-20” P.Z.
R064XY036NE**

The **Introduced** state provides increased forage, and, therefore; a potential for increased herbivore populations such as deer, pronghorn, and various small mammals. These sites provide diverse foraging, reproductive, and escape cover favoring multiple edge species.

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. These sites greatly reduce foraging, reproductive, and escape cover for grassland nesting bird species.

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

Common Name	Cattle	Sheep	Horses	Deer	Antelope	Bison	Elk
Grasses & Grass-like							
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
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
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
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
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
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
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							
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
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
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
false gromwell	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
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
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
gromwell	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
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
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
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
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
textile 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
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
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
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
wild parsley	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							
broom snakeweed	N N N N	U U U U	N N N N	U U U U	U U U U	N N N N	U U U U
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
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
snowberry	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

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.

As this site improves in condition through proper management (from the more shortgrass dominated plant communities to the Western Wheatgrass/Needleandthread Plant Community), the advantage for livestock production includes: higher forage production from cool season grasses, improved early spring forage production and higher water infiltration. The disadvantage for livestock include: reduction in cool/warm season grass mix which would provides better management flexibility, less plant diversity, and a potential increase in soil erosion. The Threeawn/Annuals Plant Community is of limited value for livestock production.

Plant Community	Average Annual Production (lbs./acre, air-dry)	Stocking Rate* (AUM/acre)
Western Wheatgrass/Needleandthread	2400	0.60 – 0.70
Blue Grama/Buffalograss/Western Wheatgrass	1600	0.45 – 0.53
Western Wheatgrass/Bluegrass/Annuals	1700	**
Blue Grama/Buffalograss Sod	800	0.30 – 0.35
Juniper/Ponderosa Pine	800	**
Threeawn/Annuals	700	0.12 – 0.18

* 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 this site. This site is dominated by soils in hydrologic group B, with localized areas in hydrologic group C. Infiltration and runoff potential for this site varies from moderate to high depending on soil hydrologic group, slope and ground cover. In many cases, areas with greater than 75% ground cover have the greatest potential for high infiltration and lower runoff. An example of an exception would be where shortgrasses form a strong sod and dominate the site. Areas where ground cover is less than 50% have the greatest potential to have reduced infiltration and higher runoff (refer to Section 4, NRCS National Engineering Handbook for runoff quantities and hydrologic curves).

Recreational Uses

This site provides hunting, hiking, photography, bird watching and other opportunities. The wide 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

(064XY037NE) – Thin Upland (064XY026NE) – Loamy Overflow (064XY040NE) – Shallow
(064XY032NE) – Sandy 17-20” P.Z. (064XY035NE) – Clayey 17-20” P.Z.

Similar Sites

(064XY035NE) – Clayey 17-20” P.Z. [green needlegrass dominant; needleandthread minor]
(064XY026NE) – Loamy Overflow [less needleandthread; more big bluestem; more productive]
(064XY037NE) – Thin Upland [more little bluestem & sideoats grama; less western wheatgrass]

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	7	1968 – 1989	NE, SD	Dawes, Shannon, Sheridan

State Correlation

This site has been correlated with Nebraska and South Dakota 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.

Site Type: Rangeland
MLRA: 64 – Mixed Sandy and Silty Tableland

**Loamy 17-20” P.Z.
R064XY036NE**

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