

United States Department of Agriculture Natural Resources Conservation Service

Ecological Site Description

Site Type: Rangeland
Site Name: Loamy Terrace
Site ID: R066XY066NE

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

Physiographic Features

This site occurs on nearly level to gently sloping areas along drainageways of uplands and in valleys. This site receives run-in water from areas higher on the landscape, but is rarely subject to flooding.



Landform: stream terrace	Aspect: N/A	
	<u>Minimum</u>	<u>Maximum</u>
Elevation (feet):	1900	3000
Slope (percent):	0	2
Water Table Depth (inches):	80	80
Flooding:		
Frequency:	None	Rare
Duration:	None	Brief
Ponding:		
Depth (inches):	None	None
Frequency:	None	None
Duration:	None	None
Runoff Class:	Negligible	Low

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, SD) to about 23° F (Ainsworth, 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.

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

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

	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 soils in this site are moderately well to well drained and formed in alluvium. The silt loam surface layer is 2 to 8 inches thick. The soils have a moderate infiltration rate. This site should show 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.

These soils are mainly susceptible to water erosion. The hazard of water erosion increases where vegetative cover is not adequate. A drastic loss of the soil surface layer 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
Parent Material Origin:
Surface Texture: 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
Subsurface Fragments > 3" (% Volume): 0

	<u>Minimum</u>	<u>Maximum</u>
Drainage Class:	moderately well	well
Permeability Class:	moderate	moderate
Depth (inches):	80	80
Electrical Conductivity (mmhos/cm)*:	0	2
Sodium Absorption Ratio*:	0	10
Soil Reaction (1:1 Water)*:	6.6	8.4
Soil Reaction (0.1M CaCl₂)*:	NA	NA
Available Water Capacity (inches)*:	6	7
Calcium Carbonate Equivalent (percent)*:	0	20

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

Plant Communities

Ecological Dynamics of the Site:

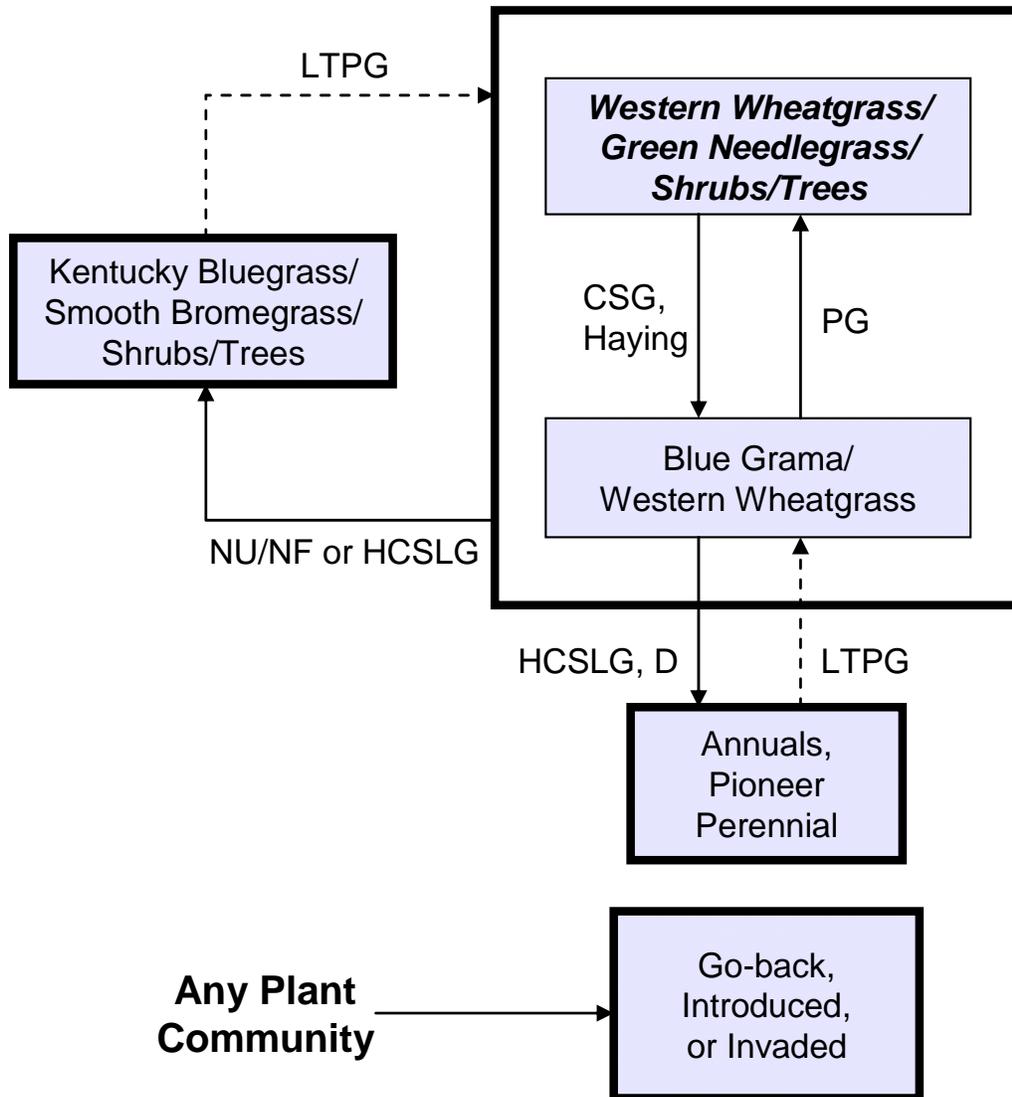
This site developed under Northern Great Plains climatic conditions, natural influences of large herbivores, occasional fire, and other biotic and abiotic factors that typically influence soil/site development. Changes will occur in the plant communities due to short-term weather variations, impacts 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.

A high percentage of these areas have been tilled in the past, and have been planted to alfalfa for haying or are in a winter wheat/fallow rotation. Also, many of these areas are located in good winter livestock areas and are used as calving/feeding areas. Very few areas exist that have not had severe soil disturbance. Many areas that have not been tilled have been continuously hayed resulting in a mono-culture of western wheatgrass. Continuous seasonal grazing without adequate recovery periods following each grazing occurrence over several years causes this site to depart from the climax species. Species such as blue grama will initially increase. Western wheatgrass, green needlegrass, and sideoats grama will decrease in frequency and production. Extended periods of non-use and/or lack of fire or heavy, continuous season-long grazing will result in a plant community having high litter levels, which favors an increase in Kentucky bluegrass and/or smooth brome grass and in time, shrubs and trees such as western snowberry, chokecherry and green ash.

Interpretations are primarily based on the Western Wheatgrass/Green Needlegrass/Shrubs/Trees 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); **D** – Defoliation; **HCSLG** – Heavy, continuous season-long grazing; **LTPG** – Long-term prescribed grazing; **NU/NF** – Extended period of non-use & no fire; **PG** – Prescribed grazing (planned, controlled harvest of vegetation with grazing or browsing animals – see FOTG, Section IV, 528).

Plant Community Composition and Group Annual Production

COMMON/GROUP NAME	SCIENTIFIC NAME	SYMBOL	Western Wheatgrass/Green Needlegrass/Shrubs/Trees		
			Group	lbs./acre	% Comp
GRASSES & GRASS-LIKES				1820 - 2380	65 - 85
WHEATGRASSES			1	560 - 980	20 - 35
western wheatgrass	Pascopyrum smithii	PASM	1	420 - 980	15 - 35
slender wheatgrass	Elymus trachycaulus	ELTR7	1	140 - 560	5 - 20
COOL-SEASON BUNCHGRASSES			2	420 - 700	15 - 25
green needlegrass	Nassella viridula	NAV4	2	280 - 560	10 - 20
Canada wildrye	Elymus canadensis	ELCA4	2	56 - 280	2 - 10
porcupine grass	Hesperostipa spartea	HESP11	2	0 - 140	0 - 5
needleandthread	Hesperostipa comata ssp. comata	HECOC8	2	0 - 140	0 - 5
MID & TALL WARM-SEASON GRASSES			3	140 - 560	5 - 20
big bluestem	Andropogon gerardii	ANGE	3	56 - 420	2 - 15
prairie sandreed	Calamovilfa longifolia	CALO	3	0 - 140	0 - 5
Indiangrass	Sorghastrum nutans	SONU2	3	0 - 140	0 - 5
little bluestem	Schizachyrium scoparium	SCSC	3	0 - 140	0 - 5
sideoats grama	Bouteloua curtipendula	BOCU	3	0 - 140	0 - 5
tall dropseed	Sporobolus compositus var. compositus	SPCOC2	3	0 - 84	0 - 3
SHORT WARM-SEASON GRASSES			4	28 - 140	1 - 5
blue grama	Bouteloua gracilis	BOGR2	4	28 - 140	1 - 5
buffalograss	Bouteloua dactyloides	BODA2	4	0 - 84	0 - 3
sand dropseed	Sporobolus cryptandrus	SPCR	4	0 - 56	0 - 2
OTHER NATIVE GRASSES			5	28 - 140	1 - 5
prairie junegrass	Koeleria macrantha	KOMA	5	28 - 84	1 - 3
inland saltgrass	Distichlis spicata	DISP	5	0 - 56	0 - 2
other grasses		2GRAM	5	0 - 140	0 - 5
GRASS-LIKES			6	28 - 196	1 - 7
sedge	Carex spp.	CAREX	6	28 - 196	1 - 7
other grass-likes		2GL	6	0 - 84	0 - 3
FORBS			8	140 - 280	5 - 10
American licorice	Glycyrrhiza lepidota	GLLE3	8	28 - 84	1 - 3
American vetch	Vicia americana	VIAM	8	28 - 56	1 - 2
cudweed sagewort	Artemisia ludoviciana	ARLU	8	28 - 84	1 - 3
dotted gayfeather	Liatris punctata	LIPU	8	0 - 28	0 - 1
false boneset	Brickellia eupatorioides	BREU	8	0 - 28	0 - 1
goldenrod	Solidago spp.	SOLID	8	28 - 84	1 - 3
green sagewort	Artemisia campestris	ARCA12	8	0 - 56	0 - 2
heath aster	Symphyotrichum ericoides	SYER	8	28 - 56	1 - 2
Maximilian sunflower	Helianthus maximiliani	HEMA2	8	28 - 84	1 - 3
mint	Mentha spp.	MENTH	8	0 - 56	0 - 2
nettle	Urtica spp.	URTIC	8	0 - 28	0 - 1
prairie clover	Dalea spp.	DALEA	8	28 - 56	1 - 2
prairie coneflower	Ratibida columnifera	RACO3	8	28 - 56	1 - 2
scarlet gaura	Gaura coccinea	GACO5	8	0 - 28	0 - 1
scurfpea	Psoraleidium spp.	PSORA2	8	28 - 56	1 - 2
stiff sunflower	Helianthus pauciflorus	HEPA19	8	0 - 28	0 - 1
wavyleaf thistle	Cirsium undulatum	CIUN	8	28 - 56	1 - 2
western ragweed	Ambrosia psilostachya	AMPS	8	0 - 28	0 - 1
western yarrow	Achillea millefolium var. occidentalis	ACMIO	8	28 - 56	1 - 2
wood lily	Lilium philadelphicum	LIPH	8	0 - 28	0 - 1
woolly verbena	Verbena stricta	VEST	8	28 - 56	1 - 2
native forbs		2FN	8	28 - 140	1 - 5
SHRUBS			9	140 - 420	5 - 15
American plum	Prunus americana	PRAM	9	0 - 224	0 - 8
chokecherry	Prunus virginiana	PRVI	9	0 - 140	0 - 5
false indigo	Amorpha fruticosa	AMFR	9	0 - 28	0 - 1
leadplant	Amorpha canescens	AMCA6	9	28 - 140	1 - 5
rose	Rosa spp.	ROSA5	9	28 - 84	1 - 3
silver buffaloberry	Shepherdia argentea	SHAR	9	0 - 224	0 - 8
western snowberry	Symphoricarpos occidentalis	SYOC	9	28 - 280	1 - 10
other shrubs		2SHRUB	9	0 - 224	0 - 8
TREES			10	28 - 224	1 - 8
American elm	Ulmus americana	ULAM	10	0 - 140	0 - 5
boxelder	Acer negundo	ACNE2	10	0 - 140	0 - 5
bur oak	Quercus macrocarpa	QUMA2	10	0 - 224	0 - 8
green ash	Fraxinus pennsylvanica	FRPE	10	0 - 224	0 - 8
hackberry	Celtis occidentalis	CEOC	10	0 - 140	0 - 5
plains cottonwood	Populus deltoides ssp. monilifera	PODEM	10	0 - 140	0 - 5
other trees		2TREE	10	0 - 140	0 - 5

Annual Production lbs./acre	LOW	RV	HIGH
GRASSES & GRASS-LIKES	1725	2184	2525
FORBS	125	210	320
SHRUBS	125	280	500
TREES	25	126	255
TOTAL	2000	2800	3600

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

Plant Community Composition and Group Annual Production

COMMON/GROUP NAME	SYMBOL	Western Wheatgrass/Green Needlegrass/Shrubs/Trees			Blue Grama/ Western Wheatgrass			Kentucky Bluegrass/Smooth Brome-grasses/Shrubs/Trees		
		Grp	lbs./acre	% Comp	Grp	lbs./acre	% Comp	Grp	lbs./acre	% Comp
GRASSES & GRASS-LIKES			2100 - 2520	75 - 90		1170 - 1530	65 - 85		1300 - 1700	65 - 85
WHEATGRASSES		1	560 - 980	20 - 35	1	180 - 450	10 - 25	1	40 - 200	2 - 10
western wheatgrass	PASM	1	420 - 980	15 - 35	1	180 - 450	10 - 25	1	40 - 200	2 - 10
slender wheatgrass	ELTR7	1	140 - 560	5 - 20	1	0 - 36	0 - 2	1	0 - 20	0 - 1
COOL-SEASON BUNCHGRASSES		2	420 - 700	15 - 25	2	90 - 180	5 - 10	2	20 - 200	1 - 10
green needlegrass	NAVI4	2	280 - 560	10 - 20	2	36 - 144	2 - 8	2	20 - 200	1 - 10
Canada wildrye	ELCA4	2	56 - 280	2 - 10	2	18 - 90	1 - 5	2	0 - 60	0 - 3
porcupine grass	HESP11	2	0 - 140	0 - 5						
needleandthread	HECO8	2	0 - 140	0 - 5		0 - 54	0 - 3			
MID & TALL WARM-SEASON		3	140 - 560	5 - 20	3	36 - 144	2 - 8	3	0 - 60	0 - 3
big bluestem	ANGE	3	56 - 280	2 - 10	3	0 - 54	0 - 3			
prairie sandreed	CALO	3	0 - 140	0 - 5	3	0 - 36	0 - 2			
Indiangrass	SONU2	3	0 - 140	0 - 5						
little bluestem	SCSC	3	0 - 140	0 - 5	3	0 - 18	0 - 1			
sideoats grama	BOCU	3	0 - 140	0 - 5	3	0 - 36	0 - 2			
tall dropseed	SPCO2	3	0 - 84	0 - 3	3	0 - 90	0 - 5	3	0 - 60	0 - 3
SHORT WARM-SEASON GRASSES		4	28 - 140	1 - 5	4	270 - 540	15 - 30	4	40 - 200	2 - 10
blue grama	BOGR2	4	28 - 140	1 - 5	4	180 - 450	10 - 25	4	40 - 200	2 - 10
buffalograss	BODA2	4	0 - 84	0 - 3	4	18 - 180	1 - 10	4	0 - 60	0 - 3
sand dropseed	SPCR	4	0 - 56	0 - 2	4	18 - 90	1 - 5	4	0 - 100	0 - 5
OTHER NATIVE GRASSES		5	28 - 140	1 - 5	5	18 - 90	1 - 5	5	0 - 100	0 - 5
prairie junegrass	KOMA	5	28 - 84	1 - 3	5	18 - 36	1 - 2	5	0 - 20	0 - 1
inland saltgrass	DISP	5	0 - 56	0 - 2	5	0 - 90	0 - 5	5	0 - 80	0 - 4
other grasses	2GRAM	5	0 - 140	0 - 5	5	0 - 90	0 - 5	5	0 - 100	0 - 5
GRASS-LIKES		6	28 - 196	1 - 7	6	36 - 180	2 - 10	6	20 - 100	1 - 5
sedge	CAREX	6	28 - 196	1 - 7	6	36 - 180	2 - 10	6	20 - 100	1 - 5
other grass-like	2GL	6	0 - 84	0 - 3	6	0 - 90	0 - 5	6	0 - 100	0 - 5
NON-NATIVE GRASSES		7			7	0 - 180	0 - 10	7	500 - 1000	25 - 50
bluegrass	POA				7	0 - 144	0 - 8	7	200 - 700	10 - 35
cheatgrass	BRTE				7	0 - 90	0 - 5	7	20 - 200	1 - 10
smooth brome-grass	BRIN2				7	0 - 90	0 - 5	7	200 - 700	10 - 35
FORBS		8	140 - 280	5 - 10	8	90 - 270	5 - 15	8	100 - 200	5 - 10
American licorice	GLLE3	8	28 - 84	1 - 3	8	0 - 18	0 - 1			
American vetch	VIAM	8	28 - 56	1 - 2						
common mullein	VETH				8	0 - 36	0 - 2	8	0 - 80	0 - 4
cudweed sagewort	ARLU	8	28 - 84	1 - 3	8	18 - 90	1 - 5	8	20 - 100	1 - 5
curlycup gumweed	GRSQ				8	0 - 36	0 - 2	8	0 - 60	0 - 3
dotted gayfeather	LIPU	8	0 - 28	0 - 1	8	0 - 18	0 - 1			
false bonaset	BREU	8	0 - 28	0 - 1						
goldenrod	SOLID	8	28 - 84	1 - 3	8	18 - 72	1 - 4	8	20 - 60	1 - 3
green sagewort	ARCA12	8	0 - 56	0 - 2	8	0 - 54	0 - 3	8	0 - 80	0 - 4
heath aster	SYER	8	28 - 56	1 - 2	8	18 - 36	1 - 2	8	20 - 60	1 - 3
marestail	COCA5				8	0 - 36	0 - 2	8	0 - 80	0 - 4
Maximilian sunflower	HEMA2	8	28 - 84	1 - 3	8	0 - 18	0 - 1			
mint	MENTH	8	0 - 56	0 - 2						
nettle	URTIC	8	0 - 28	0 - 1	8	0 - 36	0 - 2	8	0 - 40	0 - 2
prairie clover	DALEA	8	28 - 56	1 - 2	8	0 - 18	0 - 1			
prairie coneflower	RACO3	8	28 - 56	1 - 2	8	0 - 18	0 - 1			
scarlet gaura	GACO5	8	0 - 28	0 - 1						
scurfpea	PSORA2	8	28 - 56	1 - 2	8	18 - 54	1 - 3	8	20 - 40	1 - 2
stiff sunflower	HEPA19	8	0 - 28	0 - 1						
wavyleaf thistle	CIUN	8	28 - 56	1 - 2	8	0 - 36	0 - 2			
western ragweed	AMPS	8	0 - 28	0 - 1	8	18 - 36	1 - 2	8	20 - 40	1 - 2
western salsify	TRDU				8	0 - 18	0 - 1	8	20 - 60	1 - 3
western yarrow	ACMIO	8	28 - 56	1 - 2	8	18 - 54	1 - 3	8	20 - 80	1 - 4
wood lily	LIPH	8	0 - 28	0 - 1						
woolly verbena	VEST	8	28 - 56	1 - 2	8	18 - 54	1 - 3	8	20 - 60	1 - 3
native forbs	2FN	8	28 - 140	1 - 5	8	18 - 90	1 - 5	8	20 - 80	1 - 4
introduced forbs	2FI				8	0 - 90	0 - 5	8	0 - 160	0 - 8
SHRUBS		9	140 - 420	5 - 15	9	90 - 270	5 - 15	9	200 - 400	10 - 20
American plum	PRAM	9	0 - 224	0 - 8	9	0 - 36	0 - 2	9	0 - 100	0 - 5
chokecherry	PRVI	9	0 - 140	0 - 5	9	0 - 18	0 - 1			
false indigo	AMFR	9	0 - 28	0 - 1						
leadplant	AMCA6	9	28 - 140	1 - 5	9	0 - 36	0 - 2			
rose	ROSA5	9	28 - 84	1 - 3	9	18 - 54	1 - 3	9	20 - 40	1 - 2
silver buffaloberry	SHAR	9	0 - 224	0 - 8	9	0 - 36	0 - 2	9	0 - 20	0 - 1
western snowberry	SYOC	9	28 - 280	1 - 10	9	36 - 180	2 - 10	9	100 - 400	5 - 20
other shrubs	2SHRUB	9	0 - 224	0 - 8	9	0 - 90	0 - 5	9	0 - 100	0 - 5
TREES		10	28 - 224	1 - 8	10	0 - 90	0 - 5	10	20 - 160	1 - 8
American elm	ULAM	10	0 - 140	0 - 5	10	0 - 54	0 - 3	10	0 - 100	0 - 5
boxelder	ACNE2	10	0 - 140	0 - 5	10	0 - 54	0 - 3	10	0 - 100	0 - 5
bur oak	QUMA2	10	0 - 224	0 - 8	10	0 - 90	0 - 5	10	0 - 160	0 - 8
green ash	FRPE	10	0 - 224	0 - 8	10	0 - 90	0 - 5	10	0 - 160	0 - 8
hackberry	CEOC	10	0 - 140	0 - 5	10	0 - 54	0 - 3	10	0 - 100	0 - 5
plains cottonwood	PODEM	10	0 - 140	0 - 5	10	0 - 54	0 - 3	10	0 - 100	0 - 5
other trees	2TREE	10	0 - 140	0 - 5	10	0 - 54	0 - 3	10	0 - 100	0 - 5
Annual Production lbs./acre			LOW RV HIGH		LOW RV HIGH		LOW RV HIGH		LOW RV HIGH	
GRASSES & GRASS-LIKES			1725 - 2184 - 2525		1030 - 1395 - 1685		715 - 1460 - 2120			
FORBS			125 - 210 - 320		85 - 180 - 310		95 - 150 - 225			
SHRUBS			125 - 280 - 500		85 - 180 - 310		175 - 300 - 475			
TREES			25 - 126 - 255		0 - 45 - 95		15 - 90 - 180			
TOTAL			2000 - 2800 - 3600		1200 - 1800 - 2400		1000 - 2000 - 3000			

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/Green Needlegrass/Shrubs/Trees Plant Community

Interpretations are based primarily on the Western Wheatgrass/Green Needlegrass/Shrubs/Trees Plant Community, which is considered to be the climax community. The potential vegetation is between 65 to 90 percent grasses or grass-like plants, 5 to 10 percent forbs, 5 to 15 percent shrubs, and 1 to 8 percent trees. The community is dominated by cool-season grasses.

The major grasses include western wheatgrass, and green needlegrass. Other prominent grasses and grass-likes include Canada wildrye, big bluestem, sideoats grama, blue grama, prairie sandreed, and sedges. Forbs consist of American licorice, goldenrod, Maximilian sunflower, and cudweed sagewort. Woody species found on this site are leadplant, American plum, and western snowberry. Common trees include American elm, bur oak, green ash, and plains cottonwood.

This plant community is productive and diverse. The diversity in plant species allows for high drought tolerance. This is a sustainable plant community in regards to site/soil stability, watershed function, and biologic integrity.

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

Growth curve number: NE6634

Growth curve name: Eroded Tableland, 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

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

- Continuous seasonal grazing and/or haying will convert the plant community to the *Blue Grama/Western Wheatgrass Plant Community*.
- Non-use and/or no fire or heavy, continuous season-long grazing will shift plant community towards the *Kentucky Bluegrass/Smooth Bromegrass/Shrubs/Trees Plant Community*.

Blue Grama/Western Wheatgrass Plant Community

This plant community can slowly develop from the adverse effects of continuous seasonal grazing without adequate recovery periods between each grazing event during the growing season. Recognition of this plant community will enable the land user to implement key management decisions before a significant ecological threshold is crossed. Blue grama and western wheatgrass are the dominant species. Green needlegrass has been greatly reduced. Buffalograss, bluegrass, and sedges increase.

Forb species include cudweed sagewort, western yarrow, scurfpeas, goldenrod and woolly verbena. Leadplant has been greatly reduced while western snowberry increases. Common trees include American elm, bur oak, green ash, and plains cottonwood.

This plant community is relatively stable and less productive than the climax community. Reduction of litter and short plant heights result in higher soil temperatures, poor water infiltration rates, increased runoff and high evapotranspiration rates. This plant community can occur throughout the site, on spot grazed areas, and around water sources where season-long grazing patterns occur. Soil erosion will be minimal due to the sod forming habit of blue grama.

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

Growth curve number: 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

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

- Heavy continuous season-long grazing or defoliation will convert this plant community to the *Annuaals, Pioneer Perennial Plant Community*.
- Non-use and no fire for extended periods of time will convert this plant community to the *Kentucky Bluegrass/Smooth Bromegrass/Shrubs/Trees Plant Community*.
- Prescribed grazing with proper stocking rates and adequate recovery periods following each grazing event and proper stocking will shift this plant community back to the *Western Wheatgrass/Green Needlegrass/Shrubs/Trees Plant Community*.

Kentucky Bluegrass/Smooth Bromegrass/Shrubs/Trees Plant Community

This plant community develops after an extended period of non-use and exclusion of fire or from heavy continuous season-long grazing. Eventually litter levels become high enough to reduce native grass vigor, diversity and density. Kentucky bluegrass and/or smooth bromegrass dominates this plant community. Other grass species include western wheatgrass, blue grama, buffalograss, sand dropseed and cheatgrass. Common forbs include cudweed sagewort, green sagewort, common mullein and western yarrow. Shrubs such as western snowberry and trees such as bur oak, green ash, and plains cottonwood will increase in density and cover.

This plant community is resistant to change without prescribed grazing and/or fire. The combination of both grazing and fire is most effective in moving this plant community toward the Western Wheatgrass/Green Needlegrass/Shrubs/Trees Plant Community. Soil erosion is low. Runoff is similar to the climax community. Once the advanced stage of this plant community is reached, time and external resources will be needed to see a recovery in the diversity of the site.

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

Growth curve number: NE6634

Growth curve name: Eroded Tableland, 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

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

- Long-term prescribed grazing may convert the plant community back to the climax *Western Wheatgrass/Green Needlegrass/Shrubs/Trees Plant Community* or to the associated successional plant community assuming an adequate seed/vegetative source is available.

Annuals, Pioneer Perennial Plant Community

This plant community develops under severe disturbance, heavy continuous season-long grazing and/or excessive defoliation. This can result from heavy livestock or wildlife concentration, and cropping abandonment (go-back land). The dominant vegetation includes pioneer annual grasses, forbs, invaders, and early successional biennial and perennial species. Grasses may include sixweeks fescue, smooth brome, annual brome, crested wheatgrass, needleandthread, prairie junegrass and western wheatgrass. The dominant forbs may include curlycup gumweed, lambsquarter, salsify, kochia, field bindweed, thistles, western ragweed, and other early successional species. Shrubs that may be present include prairie rose and fringed sagewort. Plant species from adjacent ecological sites may become minor components of this plant community. The community also is susceptible to invasion of other non-native species due to severe soil disturbances and relatively high percent of bare ground.

This plant community is resistant to change, as long as soil disturbance or severe vegetation defoliation persists, thus holding back secondary plant succession. Soil erosion is potentially high. Reduced surface cover, low plant density, low plant vigor, loss of root biomass, and soil compaction, all contribute to decreased water infiltration, increased runoff, and accelerated erosion rates.

Significant economic inputs, management and time would be required to move this plant community toward a higher successional stage and a more productive plant community. Secondary succession is highly variable, depending upon availability and diversity of a viable seed bank of higher successional species within the existing plant community and neighboring plant communities. This plant community can be renovated to improve the production capability, but management changes would be needed to maintain the new plant community.

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

Growth curve number: NE6634

Growth curve name: Eroded Tableland, 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

Transitions or 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 eventually leading to the *Western Wheatgrass/Green Needlegrass/Shrubs/Trees Plant Community*. Depending on the slope, aspect, and size, and if adequate perennial plants exist, this change can occur more rapidly.

Go-back, Introduced, or Invaded Plant Community

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

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

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

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

Ecological Site Interpretations

Animal Community – Wildlife Interpretations

-- Under Development --

Western Wheatgrass/Green Needlegrass/Shrubs/Trees Plant Community:

Blue Grama/Western Wheatgrass Plant Community:

Kentucky Bluegrass/Smooth Bromegrass/Shrubs/Trees Plant Community:

Annuals, Pioneer Perennial Plant Community:

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

Common Name	Cattle	Sheep	Horses	Deer	Antelope	Bison	Elk
Grasses and 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
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
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
inland saltgrass	N U U N	N N N N	N U U N	N N N N	N N N N	N U U N	N U U N
little bluestem	U D D U	N D N N	U D D U	N D N N	N D N N	U D D U	U D D U
needleandthread	U D U D	N D N U	U D U D	N D N U	N D N U	U D U D	U D U D
porcupine grass	U P U D	N D N U	U P U D	N D N U	N D N U	U P U D	U P U D
prairie junegrass	U D U D	N D N U	U D U D	N D N U	N D N U	U D U D	U D U D
prairie sandreed	U D D U	U D U U	U D D U	U U D U	U U D U	U D D U	U D D U
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
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
slender wheatgrass	U P U U	N D U N	U P U U	N D U N	N D U N	U P U U	U P U U
tall 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
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							
American licorice	U U D U	N U U N	U U D U	N U U N	N U U N	U U D U	N U U N
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
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
goldenrod	U U D U	N U U N	U U D U	N U U N	N U U N	U U D U	N U U N
green sagewort	U U U U	U U U U	U U U U	U U U U	U U U U	U U U U	U U U U
heath aster	U U D U	U U P U	U U D U	U U P U	U U P U	U U D U	U U P U
Maximilian sunflower	U D P U	U D P U	U D P U	U D P U	U D P U	U D P U	U D P U
mint	N N U N	N U U N	N N U N	N U U N	N U U N	N N U N	N N U N
nettle	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
prairie clover	U D P U	U P P U	U D P U	U P P U	U P P U	U D P U	U P P U
prairie coneflower	U U D U	U P P U	U U D U	U P P U	U P P U	U U D U	U P P U
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
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
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
wood lily	N U U N	N U D U	N U U N	N U D U	N U D U	N U U N	N U U N
woolly verbena	U U U U	N N N N	U U U U	N N N N	N N N N	U U U U	N N N N
Shrubs							
American plum	D U U D	D U U D	D U U D	P U D D	D U U D	D U U D	D U U D
chokecherry	D T T D	D T T D	D T T D	P U D P	D U U D	D T T D	P U U P
false indigo	N U U N	N U U N	N U U N	N U U N	N U U N	N U U N	N U U N
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
silver buffaloberry	D U U U	D U U U	D U U U	P U D P	D U U U	D U U U	D U U U
western 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
Trees							
American elm	N N N N	N N N N	N N N N	N U D N	N N N N	N N N N	N N N N
boxelder	N N N U	N N U U	N N N U	N N U U	N N U U	N N N U	N N U U
bur oak	T T T T	T T T T	N N N N	N U D U	N N N N	T T T T	N U D U
green ash	N U D U	N D D U	N U D U	N D D U	N U D U	N U D U	N D D U
hackberry	N U D U	N D D U	N U D U	N D D U	N U D U	N U D U	N D D U
plains cottonwood	D U U D	D U U D	D U U D	D U D D	D U U D	D U U D	D U U D

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

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. Infiltration is moderate. Runoff potential for this site varies from negligible to low depending on 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 short grasses 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 Part 630, NRCS National Engineering Handbook).

Recreational Uses

This site provides hunting opportunities for upland game species. The wide variety 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

(R066XY036NE) – Loamy 18-22” P.Z.

(R066XY026NE) – Loamy Overflow

(R066XY058NE) – Loamy 22-25” P.Z.

(R066XY046NE) – Subirrigated

Similar Sites

(R066XY026NE) – Loamy Overflow [more big bluestem, higher production, adjacent to stream]

(R066XY036NE) – Loamy 18-22” P.Z. [less big bluestem, lower production, steeper slopes]

(R066XY058NE) – Loamy 22-25” P.Z. [less big bluestem, lower production, steeper slopes]

Inventory Data References

Information presented here has been derived from NRCS clipping data and other inventory data. Field observations from range trained personnel was 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; Kim Stine, Rangeland Management Specialist, NRCS.

State Correlation

This site has been correlated with Nebraska and South Dakota in MLRA 66. This site was formerly called Limy Upland in Nebraska.

Field Offices Counties

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

Field Offices Counties

O'Neill, NE Holt
Spencer, NE Boyd
Valentine, NE Cherry
White River, SD Mellette, Todd
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://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