

United States Department of Agriculture Natural Resources Conservation Service

Ecological Site Description

Site Name: Very Shallow

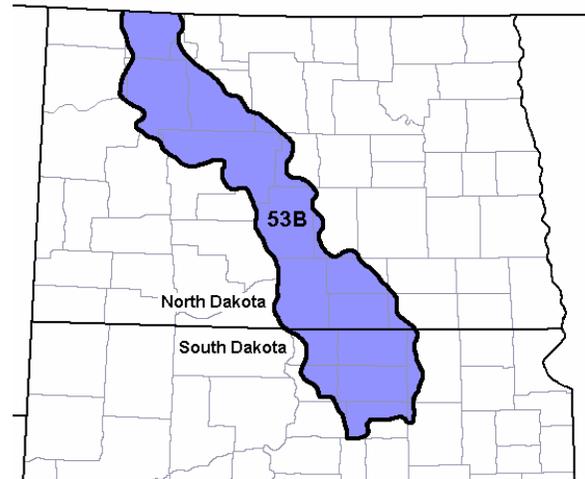
Site Type: Rangeland

Site ID: R053BY017ND

Major Land Resource Area (MLRA): 53B – Central Dark Brown Glaciated Plains

For more information on MLRA's, refer to the following Web site:

http://www.soilinfo.psu.edu/soil_lrr/.



Physiographic Features

This site typically occurs on level to very steep uplands.

Landform: outwash plain, beach ridge, terrace

Aspect: NA

	<u>Minimum</u>	<u>Maximum</u>
Elevation (feet):	1600	2000
Slope (percent):	0	35
Water Table Depth (inches):	80	80
Flooding:		
Frequency:	None	None
Duration:	None	None
Ponding:		
Depth (inches):	None	None
Frequency:	None	None
Duration:	None	None
Runoff Class:	Negligible	Very low

Climatic Features

MLRA 53B is considered to have a continental climate – cold winters and hot summers, low humidity, light rainfall, and much sunshine. Extremes in temperature are characteristic. The climate is the result of this MLRA's location in the geographic center of North America. There are few natural barriers on the northern Great Plains. The air masses move unobstructed across the plains and account for rapid changes in temperature.

Annual precipitation ranges from 15 to 20 inches per year. The normal average annual temperature is about 41°F. January is the coldest month with average temperatures ranging from about 4°F (Powers Lake, North Dakota (ND)), to about 10°F (Pollock, South Dakota (SD)). July is the warmest month with temperatures averaging from about 67°F (Powers Lake, ND), to about 72°F (Pollock, SD). The

range of normal average monthly temperatures between the coldest and warmest months is about 62°F. This large annual range attests to the continental nature of this MLRA's climate. Winds 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 native cool-season plants begins in late March and continues to early to mid-July. Native warm-season plants begin growth in mid-May and continue to the end of August. Green up of cool-season plants can occur in September and October when adequate soil moisture is present.

	<u>Minimum</u>	<u>Maximum</u>
Frost-free period (days):	110	135
Freeze-free period (days):	129	156
Mean Annual Precipitation (inches):	15	20
Average Monthly Precipitation (inches) and Temperature (°F):		

	Precip. Min.	Precip. Max	Temp. Min.	Temp. Max.
January	0.41	0.48	-6.8	21.5
February	0.41	0.57	0.7	28.9
March	0.57	1.09	12.0	39.7
April	1.31	2.01	27.0	57.4
May	1.98	2.92	38.6	70.8
June	3.17	3.80	48.4	79.3
July	2.38	2.84	52.9	86.2
August	1.82	2.17	50.8	85.6
September	1.37	1.67	39.9	74.2
October	0.62	1.30	28.3	61.2
November	0.53	0.74	13.7	41.2
December	0.43	0.43	0.3	27.2

Climate Stations		Period	
Station ID	Location or Name	From	To
ND3376	Garrison 1 NNW	1948	2001
SD4891	Leola	1948	2001
ND6383	New Town 4 W	1952	1985
SD6712	Pollock	1948	2001
ND7281	Powers Lake	1948	2001
SD7277	Roscoe	1948	2001

For local 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

These are very deep, excessively drained, moderately coarse and medium textured soils that are very shallow to porcelanite or sand and/or sand and gravel. Saturated hydraulic conductivity is very rapid and available water capacity is low and very low. Salinity and sodicity are none. This site is on flats, rises, and ridges on outwash plains, beach ridges, and terraces. Slope ranges from 0 to 35 percent. While a definite restrictive layer is not present, the presence of a high amount of gravels in the subsurface layers at a depth of 10 or less inches creates a droughty condition which acts like a

restrictive layer to the majority of plants. 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 very unstable but intact. Sub-surface soil layers are restrictive to water movement and root penetration.

Low available water capacity caused by the shallow rooting depth strongly influences the soil-water-plant relationship. Loss of the soil surface layer can result in a shift in species composition and/or production.

Major soil series correlated to this ecological site can be found in Section II of the Natural Resources Conservation Service (NRCS) Field Office Technical Guide or the following Web sites: <http://www.nrcs.usda.gov/technical/efotg/>.

Parent Material Kind: glaciofluvial deposits
Parent Material Origin: mixed
Surface Texture: loam, sandy loam
Surface Texture Modifier: none, gravelly, stony
Subsurface Texture Group: loamy
Surface Fragments ≤3" (% Cover): 10-50
Surface Fragments >3" (%Cover): 0-50
Subsurface Fragments ≤3" (% Volume): 20-90
Subsurface Fragments >3" (% Volume): 0-65

	<u>Minimum</u>	<u>Maximum</u>
Drainage Class:	excessively	excessively
Permeability Class:	rapid	very rapid
Depth to first restrictive layer (inches):	80	80
Electrical Conductivity (mmhos/cm)*:	0	0
Sodium Absorption Ratio*:	0	0
Soil Reaction (1:1 Water)*:	6.6	8.4
Soil Reaction (0.1M CaCl₂)*:	NA	NA
Available Water Capacity (inches)*:	1	3
Calcium Carbonate Equivalent (percent)*:	0	15

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

Plant Communities

Ecological Dynamics of the Site:

The site developed under Northern Great Plains climatic conditions, and included natural influence of large herbivores and occasional fire. Changes will occur in the plant communities due to climatic conditions and/or management actions. Due to the nature of the soils, the site is considered very fragile. Under continued adverse impacts, a very rapid decline in vegetative vigor and composition will occur. Under favorable vegetative management treatments, the site can very slowly return to the Historic Climax Plant Community (HCPC).

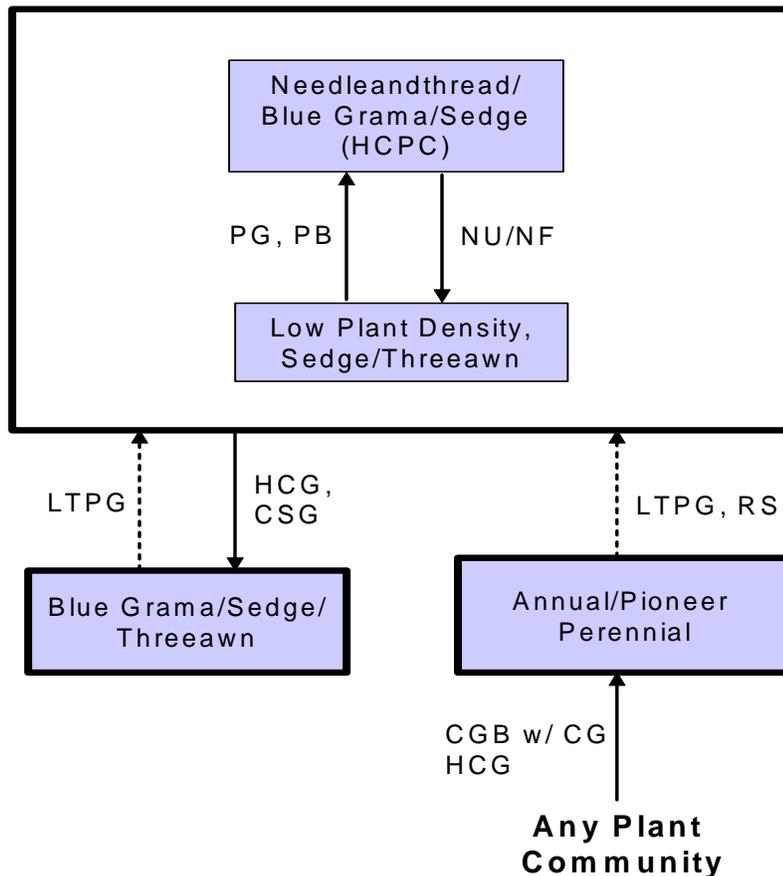
The plant community upon which interpretations are primarily based is the HCPC. The HCPC has been determined by study of rangeland relic areas, areas protected from excessive disturbance, and areas under long-term rotational grazing regimes. Trends in plant community dynamics ranging from heavily grazed to lightly grazed areas, seasonal use pastures, and historical accounts also have been considered. Subclimax plant communities, states, transitional pathways, and thresholds have been determined through similar studies and experience.

Continuous grazing without adequate recovery periods following each grazing occurrence over several years causes this site to depart from the HCPC. Species such as threadleaf sedge and blue grama will initially increase. Plains muhly, western wheatgrass, little bluestem, and sideoats grama will decrease in frequency and production and later disappear. Heavy continuous grazing causes blue grama and/or threadleaf sedge to increase. In time, heavy continuous grazing will likely cause upland sedges and blue grama to dominate and pioneer perennials and annuals to increase. The resulting plant community is relatively stable and the competitive advantage prevents other species from establishing.

Extended periods of non-use and lack of fire will result in a plant community having low density with higher litter amounts, which favors an increase in cheatgrass, Sandberg bluegrass and sweetclover. In time, shrubs such as cactus, creeping juniper and skunkbrush sumac will increase.

The following diagram illustrates the common plant communities and vegetation states commonly occurring on the site and the transition pathways between communities and states. The ecological processes will be discussed in more detail in the plant community descriptions following the diagram.

Plant Communities and Transitional Pathways



CGB w/ CG – Cropped go-back with continuous grazing; **CSG** – Continuous seasonal grazing; **HCG** – Heavy continuous grazing; **HCPC** – Historical Climax Plant Community; **LTPG** – Long-term prescribed grazing; **NU/NF** – Extended period of non-use & no fire; **PB** – Prescribed burning; **PG** – Prescribed grazing; **RS** – Range seeding followed by prescribed grazing.

Plant Community Composition and Group Annual Production

COMMON/GROUP NAME	SYMBOL	Needleandthread/Blue Grama/Sedge (HCPC)			
		Group	lbs./acre	% Comp	
GRASSES & GRASS-LIKES			960 - 1080	80 - 90	
NEEDLEGRASS		1	180 - 300	15 - 25	
needleandthread	HECOC8	1	180 - 300	15 - 25	
GRAMA		2	120 - 300	10 - 25	
blue grama	BOGR2	2	60 - 240	5 - 20	
hairy grama	BOHI2	2	24 - 60	2 - 5	
sideoats grama	BOCU	2	24 - 60	2 - 5	
MID WARM-SEASON		3	36 - 96	3 - 8	
plains muhly	MUCU3	3	24 - 96	2 - 8	
little bluestem	SCSC	3	12 - 60	1 - 5	
WHEATGRASS		4	24 - 96	2 - 8	
western wheatgrass	PASM	4	24 - 96	2 - 8	
slender wheatgrass	ELTRT	4	0 - 60	0 - 5	
thickspike wheatgrass	ELLAL	4	0 - 60	0 - 5	
OTHER NATIVE GRASSES		5	36 - 96	3 - 8	
red threeawn	ARPUL	5	12 - 36	1 - 3	
sand dropseed	SPCR	5	12 - 24	1 - 2	
prairie junegrass	KOMA	5	12 - 24	1 - 2	
plains reedgrass	CAMO	5	0 - 12	0 - 1	
other perennial grasses	2GP	5	0 - 36	0 - 3	
GRASS-LIKES		6	60 - 156	5 - 13	
threadleaf sedge	CAFI	6	60 - 156	5 - 13	
other grass-likes	2GL	6	0 - 60	0 - 5	
FORBS		7	60 - 96	5 - 8	
American pasqueflower	PUPA5	7	0 - 12	0 - 1	
blanketflower	GAAR	7	0 - 12	0 - 1	
cutleaf ironplant	MAPI	7	12 - 24	1 - 2	
gayfeather	LIATR	7	12 - 36	1 - 3	
green sagewort	ARDR4	7	12 - 24	1 - 2	
heath aster	SYER	7	12 - 24	1 - 2	
Hood's phlox	PHHO	7	12 - 24	1 - 2	
plains milkvetch	ASGI5	7	0 - 12	0 - 1	
prairie clover	DALEA	7	12 - 36	1 - 3	
prairie coneflower	RACO3	7	12 - 24	1 - 2	
purple coneflower	ECAN2	7	12 - 36	1 - 3	
pussytoes	ANTEN	7	0 - 12	0 - 1	
rush skeletonweed	LYJU	7	0 - 12	0 - 1	
scarlet gaura	GACO5	7	0 - 12	0 - 1	
scarlet globemallow	SPCO	7	0 - 12	0 - 1	
wild onion	ALLIU	7	0 - 12	0 - 1	
yellow wild buckwheat	ERFLF	7	12 - 24	1 - 2	
other perennial forbs	2FP	7	12 - 24	1 - 2	
other annual forbs	2FA	7	12 - 24	1 - 2	
SHRUBS		8	24 - 60	2 - 5	
cactus	OPUNT	8	12 - 24	1 - 2	
creeping juniper	JUHO2	8	0 - 12	0 - 1	
fringed sagewort	ARFR4	8	12 - 24	1 - 2	
leadplant	AMCA6	8	12 - 24	1 - 2	
rose	ROSA5	8	12 - 24	1 - 2	
skunkbush sumac	RHTR	8	0 - 12	0 - 1	
small soapweed	YUGL	8	12 - 24	1 - 2	
other shrubs	2SHRUB	8	0 - 36	0 - 3	
Annual Production lbs./acre			LOW	RV	HIGH
GRASSES & GRASS-LIKES			625 -	1080	- 1535
FORBS			55 -	78	- 100
SHRUBS			20 -	42	- 65
TOTAL			700 -	1200	- 1700

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	Needleandthread/Blue Grama/ Sedge (HCPC)			Blue Grama/Sedge/Threawn			Low Plant Density, Sedge/Threawn		
		Grp	lbs./acre	% Comp	Grp	lbs./acre	% Comp	Grp	lbs./acre	% Comp
GRASSES & GRASS-LIKES										
NEEDLEGRASS										
needleandthread	HECOC8	1	180 - 300	15 - 25	1	4 - 20	1 - 5	1	18 - 90	2 - 10
GRAMA										
blue grama	BOGR2	2	60 - 240	5 - 20	2	40 - 120	10 - 30	2	45 - 90	5 - 10
hairy grama	BOHI2	2	24 - 60	2 - 5	2	0 - 40	0 - 10	2	0 - 45	0 - 5
sideoats grama	BOCU	2	24 - 60	2 - 5	2	0 - 20	0 - 5	2	0 - 45	0 - 5
MID WARM-SEASON										
plains muhly	MUCU3	3	24 - 96	2 - 8						
little bluestem	SCSC	3	12 - 60	1 - 5				3	0 - 27	0 - 3
WHEATGRASS										
western wheatgrass	PASM	4	24 - 96	2 - 8	4	4 - 20	1 - 5	4	18 - 90	2 - 10
slender wheatgrass	ELTR7	4	0 - 60	0 - 5				4	0 - 9	0 - 1
thickspike wheatgrass	ELLAL	4	0 - 60	0 - 5	4	0 - 8	0 - 2	4	0 - 27	0 - 3
OTHER NATIVE GRASSES										
red threawn	ARPUL	5	12 - 36	1 - 3	5	8 - 40	2 - 10	5	18 - 135	2 - 15
sand dropseed	SPCR	5	12 - 24	1 - 2	5	4 - 20	1 - 5	5	9 - 45	1 - 5
prairie junegrass	KOMA	5	12 - 24	1 - 2	5	4 - 8	1 - 2	5	9 - 18	1 - 2
plains reedgrass	CAMO	5	0 - 12	0 - 1						
other perennial grasses	2GP	5	0 - 36	0 - 3	5	0 - 12	0 - 3	5	0 - 27	0 - 3
GRASS-LIKES										
threadleaf sedge	CAFI	6	60 - 156	5 - 13	6	60 - 120	15 - 30	6	45 - 135	5 - 15
other grass-likes	2GL	6	0 - 60	0 - 5	6	0 - 20	0 - 5	6	0 - 45	0 - 5
NON-NATIVE GRASSES										
Kentucky bluegrass	POPR				7	0 - 8	0 - 2	7	9 - 90	1 - 10
cheatgrass	BRTE				7	0 - 8	0 - 2	7	9 - 72	1 - 8
FORBS										
American pasqueflower	PUPA5	8	0 - 12	0 - 1	8	4 - 8	1 - 2	8	0 - 9	0 - 1
blanketflower	GAAR	8	0 - 12	0 - 1				8	0 - 9	0 - 1
common dandelion	TAOF				8	4 - 8	1 - 2	8	9 - 36	1 - 4
curlycup gumweed	GRSQ				8	4 - 12	1 - 3	8	0 - 27	0 - 3
cutleaf ironplant	MAPI	8	12 - 24	1 - 2	8	4 - 8	1 - 2	8	0 - 9	0 - 1
gayfeather	LIATR	8	12 - 36	1 - 3	8	4 - 8	1 - 2	8	9 - 18	1 - 2
green sagewort	ARDR4	8	12 - 24	1 - 2	8	4 - 12	1 - 3	8	9 - 36	1 - 4
heath aster	SYER	8	12 - 24	1 - 2	8	4 - 8	1 - 2	8	9 - 27	1 - 3
Hood's phlox	PHHO	8	12 - 24	1 - 2	8	4 - 8	1 - 2	8	0 - 9	0 - 1
plains milkvetch	ASGI5	8	0 - 12	0 - 1				8	0 - 9	0 - 1
prairie clover	DALEA	8	12 - 36	1 - 3	8	4 - 8	1 - 2	8	9 - 18	1 - 2
prairie coneflower	RACO3	8	12 - 24	1 - 2	8	4 - 8	1 - 2	8	9 - 18	1 - 2
purple coneflower	ECAN2	8	12 - 36	1 - 3				8	0 - 9	0 - 1
pussytoes	ANTEN	8	0 - 12	0 - 1	8	4 - 8	1 - 2			
rush skeletonweed	LYJU	8	0 - 12	0 - 1	8	0 - 4	0 - 1	8	0 - 9	0 - 1
scarlet gaura	GACO5	8	0 - 12	0 - 1				8	0 - 9	0 - 1
scarlet globemallow	SPCO	8	0 - 12	0 - 1	8	0 - 4	0 - 1	8	0 - 9	0 - 1
sweetclover	MELIL				8	0 - 20	0 - 5	8	0 - 63	0 - 7
western salsify	TRDU				8	0 - 12	0 - 3	8	0 - 27	0 - 3
wild onion	ALLIU	8	0 - 12	0 - 1	8	0 - 4	0 - 1			
yellow wild buckwheat	ERFLF	8	12 - 24	1 - 2	8	0 - 8	0 - 2	8	0 - 9	0 - 1
other perennial forbs	2FP	8	12 - 24	1 - 2	8	0 - 20	0 - 5	8	0 - 45	0 - 5
other annual forbs	2FA	8	12 - 24	1 - 2	8	0 - 20	0 - 5	8	0 - 45	0 - 5
SHRUBS										
cactus	OPUNT	9	12 - 24	1 - 2	9	4 - 16	1 - 4	9	9 - 27	1 - 3
creeping juniper	JUHO2	9	0 - 12	0 - 1	9	0 - 12	0 - 3	9	9 - 36	1 - 4
fringed sagewort	ARFR4	9	12 - 24	1 - 2	9	4 - 20	1 - 5	9	9 - 45	1 - 5
leadplant	AMCA6	9	12 - 24	1 - 2						
rose	ROSA5	9	12 - 24	1 - 2	9	4 - 12	1 - 3	9	9 - 36	1 - 4
skunkbush sumac	RHTR	9	0 - 12	0 - 1	9	0 - 4	0 - 1	9	0 - 9	0 - 1
yucca	YUGL	9	12 - 24	1 - 2	9	4 - 12	1 - 3	9	0 - 18	0 - 2
other shrubs	2SHRUB	9	0 - 36	0 - 3	9	0 - 12	0 - 3	9	0 - 27	0 - 3
Annual Production lbs./acre			LOW RV HIGH		LOW RV HIGH		LOW RV HIGH		LOW RV HIGH	
GRASSES & GRASS-LIKES			625 - 1080 - 1535		180 - 350 - 620		420 - 765 - 1210			
FORBS			55 - 78 - 100		15 - 30 - 45		40 - 68 - 95			
SHRUBS			20 - 42 - 65		5 - 20 - 35		40 - 68 - 95			
TOTAL			700 - 1200 - 1700		200 - 400 - 700		500 - 900 - 1400			

This list of plants and their relative proportions are based on near normal years. Fluctuations in species composition and relative production may change from year to year dependent upon precipitation or other climatic factors. RV = Representative value. Refer to PLANTS database for scientific names and codes: <http://plants.usda.gov>

Plant Community and Vegetation State Narratives

Following are the narratives for each of the described plant communities. These plant communities may not represent every possibility, but they are the most prevalent and repeatable plant communities. The plant composition tables shown above have been developed from the best available knowledge at the time of this revision. As more data are collected, some of these plant communities may be revised or removed, and new ones may be added. None of these plant communities should necessarily be thought of as “Desired Plant Communities (DPC).” According to the USDA NRCS National Range and Pasture Handbook, DPC’s will be determined by the decision-makers and will meet minimum quality criteria established by the NRCS. The main purpose for including any description of a plant community here is to capture the current knowledge and experience at the time of this revision.

Needleandthread/Blue Grama/Sedge Plant Community

This is the interpretive plant community and is considered to be the HCPC. This community evolved with grazing by large herbivores and occasional prairie fire. It is well suited for grazing by domestic livestock and can be found on areas that are properly managed with prescribed grazing that allows for proper utilization, changes in season of use, and adequate recovery periods following each grazing event.

The potential vegetation is about 87 percent grasses or grass-like plants, 8 percent forbs, and 5 percent shrubs. An even mix of both cool and warm-season grasses dominates this plant community. The major grasses and grass-likes include needleandthread, blue grama, western wheatgrass, threadleaf sedge, and plains muhly. Other grasses occurring on the site include sideoats grama, little bluestem, slender wheatgrass, hairy grama, and thickspike wheatgrass. The significant forbs include gayfeather, purple coneflower, prairie clover, and cutleaf ironplant. Significant shrubs are fringed sagewort, creeping juniper, and rose.

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). Community dynamics, nutrient cycle, water cycle, and energy flow are functioning at the sites potential. Plant litter is properly distributed with some movement offsite and natural plant mortality is low. The diversity in plant species allows for high drought tolerance.

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

Growth curve number: ND5303

Growth curve name: Missouri Coteau, 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	2	6	21	40	20	6	4	1	0	0

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

- Non-use and no fire for extended periods of time will convert this plant community to the *Low Plant Density, Sedge/Threeawn Plant Community*.
- Heavy, continuous grazing or continuous seasonal grazing (spring) will convert the plant community to the *Blue Grama/Sedge/Threeawn Plant Community*.

- Cropped go-back land with continuous grazing will convert this plant community to the *Annual/Pioneer Perennial Plant Community*.

Blue Grama/Sedge/Threawn Plant Community

This plant community can very quickly develop from the adverse effects of long-term, heavy, continuous grazing and/or continuous seasonal grazing (annual, early spring seasonal grazing). Annual grazing too early in the spring depletes stored carbohydrates, resulting in weakening and eventual death of the cool-season mid-grasses. Short grasses and forbs increase to dominate the site and annual production decreases dramatically. Lack of litter and reduced vigor result in higher soil temperatures, poor water infiltration rates, and high evapotranspiration, which gives blue grama and sedges a highly competitive advantage over cool and warm-season mid-grasses. This plant community can occur throughout the pasture, on spot grazed areas, and around water sources where season-long grazing patterns occur. Blue grama, threadleaf sedge, and red threawn are the dominant grass/grass-like species. Other grasses include western wheatgrass, needleandthread, little bluestem, plains muhly, and prairie Junegrass. Significant forbs include American pasqueflower, green sagewort, cutleaf ironplant, rush skeletonweed, prairie coneflower, and scarlet globemallow. There is usually less than 20 percent bare ground. The significant shrubs include broom snakeweed, cactus, and fringed sagewort.

This plant community is relatively stable. The competitive advantage of blue grama and threadleaf sedge prevents other species from establishing. This plant community is less productive than the HCPC. Runoff has increases and infiltration has decreased. Soil erosion will be minimal due to the “sod-like” 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 a normal year:

Growth curve number: ND5303

Growth curve name: Missouri Coteau, 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	2	6	21	40	20	6	4	1	0	0

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

- Long-term prescribed grazing that includes changing season of use and allowing adequate recovery periods to enhance cool season grasses will slowly lead this plant community back to the *Needleandthread/Blue Grama/Sedge Plant Community*.
- Heavy, continuous grazing or cropped go-back land with continuous grazing will cause further deterioration resulting in a shift to the *Annual/Pioneer Perennial Plant Community*.

Low Plant Density, Sedge/Threawn Plant Community

This plant community develops after an extended period of 15 or more years of non-use by herbivores and no fire. Plant litter may accumulate as this plant community first develops. Due to a lack of tiller stimulation and sunlight, native bunchgrasses typically develop dead centers and native rhizomatous grasses are limited to colonies. Standing decadent plants and moderate litter covers shorter understory species (i.e., short grasses and sedges), restricting their ability to capture adequate sunlight for photosynthesis. Vigor and diversity of native plants are reduced. Annual and/or biennial forbs, annual grasses, and cryptogams commonly fill interspaces once occupied by desirable species.

Crested wheatgrass, cheatgrass, and/or sweet clover may invade this plant community. All native plants present in the HCPC may be present in this state, but in less vigor and health. The common forbs include American pasqueflower, green sagewort, gayfeather, and purple coneflower. Fringed sagewort, cactus, creeping juniper, and skunkbrush sumac are the principal shrubs and tend to increase in density and cover.

This plant community is resistant to change without prescribed grazing. Grazing is the most effective treatment in moving this plant community towards the HCPC. Soil erosion is low. Compared to the HCPC, infiltration and runoff is similar. Once this plant community is reached, any of the preferred treatments can readily return the diversity and production of the site.

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

Growth curve number: ND5302

Growth curve name: Missouri Coteau, cool-season dominant, warm-season sub-dominant.

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

JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
0	0	3	7	23	42	15	5	4	1	0	0

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

- Prescribed grazing or prescribed burning followed by prescribed grazing will move this plant community toward the *Needleandthread/Blue Grama/Sedge Plant Community (HCPC)*. This would require long-term management with prescribed grazing and/or prescribed burning under controlled conditions.

Annual/Pioneer Perennial Plant Community

This plant community develops under severe disturbance. 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 red threeawn, sixweeks fescue, crested wheatgrass, annual brome, smooth brome grass, needleandthread, and prairie Junegrass. Forbs found may include curlycup gumweed, salsify, thistles, western ragweed, and other early successional species. Shrubs that may be present include prairie rose and broom snakeweed. The community is somewhat susceptible to invasion of non-native species due to severe soil disturbances and relatively high percent of bare ground. Compared to the HCPC, little bluestem, sideoats grama, and blue grama have disappeared.

This plant community is very resistant to change, as long as soil disturbance or severe vegetation defoliation persists, thus holding back secondary plant succession. 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 will take a long time in order to improve the production capability, but management changes would be needed to maintain any plant community that develops. The total annual production ranges from 100 to 500 lbs./ac. (air-dry weight) depending upon growing conditions.

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

- Under long-term prescribed grazing and/or removal of disturbance, including adequate rest periods, this plant community will move through the successional stages, and may eventually lead to a plant community resembling the *Needleandthread/Blue Grama/Sedge Plant Community (HCPC)*. This process will likely take a long period of time (50+ years). Depending on the slope, aspect, and size, and if adequate perennial plants exist, this change can occur more rapidly.

Ecological Site Interpretations

Animal Community – Wildlife Interpretations

-- Under Development --

Needleandthread/Blue Grama/Sedge Plant Community:

Blue Grama/Sedge/Threeawn Plant Community:

Low Plant Density, Sedge/Threeawn Plant Community:

Annual/Pioneer Perennial Plant Community:

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

Common Name	Cattle	Sheep	Horses	Deer	Antelope	Bison	Elk
Grasses & Grass-like							
blue grama	U D P U	D P P D	U D P U	D P P D	D P P D	U D P U	U D P U
hairy grama	U D P U	D P P D	U D P U	D P P D	D P P D	U D P U	U D P U
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
plains reedgrass	U D U U	N D N N	U D U U	N D N N	N D N N	U D U U	U D U 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
red threeawn	N N N N	N N N N	N N N N	N N N N	N N N N	N N N N	N N N N
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
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
thickspike wheatgrass	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
threadleaf sedge	U D U D	U P N D	U D U D	U D U D	U D U D	U D U D	U D U D
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 pasqueflower	N N N N	N U N N	N N N N	N U N N	N U N N	N N N N	N N N N
blanketflower	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
cutleaf ironplant	U U U U	N U U N	U U U U	N U U N	N U U N	U U U U	N U U N
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
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
Hood's phlox	U D U U	U P P U	U D U U	U P P U	U P P U	U D U U	U P P U
plains 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
prairie clover	U D P U	U P P U	U D P U	U P P U	U P P U	U D P U	U P P U
prairie coneflower	U U D U	U P P U	U U D U	U P P U	U P P U	U U D U	U P P U
purple coneflower	U U D U	U P P U	U U D U	U P P U	U P P U	U U D U	U P P U
pussytoes	U U U U	U U U U	U U U U	U U U U	U U U U	U U U U	U U U U
rush skeletonweed	U U U U	N N N N	U U U U	N N N N	N N N N	U U U U	N N N N
scarlet gaura	U U U U	N U U N	U U U U	N U U N	N U U N	U U U U	N U U N
scarlet globemallow	U U D U	U D D U	U U D U	U D D U	U D D U	U U D U	U D D U
wild onion	U D U U	U D D U	U D U U	U D D U	U D D U	U D U U	U D D U
yellow wild buckwheat	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 N U N
Shrubs							
cactus	N N N N	N N N N	N N N N	N N N N	N N N N	N N N N	N N N N
creeping juniper	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 N U
fringed sagewort	U U U U	U U U U	U U U U	U D D U	U P P D	U U U U	U U U D
leadplant	U P D U	U P D U	U P D U	U P D U	U P D U	U P D U	U P D U
rose	U D D U	U D D U	U D D U	U D D U	U D D U	U D D U	U D D U
skunkbush sumac	D U U D	D U U D	D U U D	D U U D	D U U D	D U U D	D U U D
small soapweed	D N N D	D U U D	D N N D	D U U D	D U U D	D N N D	D U U D

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

Hydrology Functions

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

Recreational Uses

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

Wood Products

No appreciable wood products are present on the site.

Other Products

Selected seed harvest of certain unique native plant species can provide additional income.

Supporting Information

Associated Sites

(053BY010ND) – Shallow to Gravel

(053BY015ND) – Thin Loamy

(053BY009ND) – Shallow Loamy

(053BY011ND) – Loamy

(053BY008ND) – Sandy

(053BY007ND) – Sands

Similar Sites

(053BY009ND) – Shallow Loamy (SwL)

[Somewhat excessively well-drained soils more than 10 less than 20 inches to bedrock that restricts root penetration. Surface layer will ribbon less than two inches and greater than one inch. Upslope from Loamy site and some times down slope from Very Shallow site. Indicator species: needlegrasses, plains muhly and sideoats grama, with dotted gayfeather, pasqueflower, purple coneflower, and purple prairie clover, and shrubs like broom snakeweed. This site has similar species but less needleandthread and blue grama, more plains muhly, green needlegrass, western wheatgrass, restrictive layer below 10 inches down to 20 inches to bedrock, more production.]

(053BY013ND) – Thin Claypan (TCp)

[Well drained soils on uplands or terraces that don't receive extra moisture with a dense sodic subsoil above 6 inches and with salts above 16 inches that restricts root penetration. Usually found in microrelief within Claypan site, indicator species are western wheatgrass, Sandberg's bluegrass with an understory of blue grama and buffalograss, heath aster, cudweed sagewort, and western yarrow along with shrubs such as fringed sagewort and brittle

cactus. This site has no little bluestem, less steeper slopes, similar production, and a different restrictive layer.]

Inventory Data References

Information presented here has been derived from NRCS clipping and other inventory data. Also, field knowledge of range-trained personnel was used. All descriptions were peer reviewed and/or field-tested by various private, state, and federal agency specialists. Those involved in developing this site description include: Stan Boltz, NRCS Range Management Specialist; Michael D. Brand, State Land Dept., Director Surface Management; David Dewald, NRCS State Biologist; Paul Drayton, NRCS District Conservationist; Jody Forman, NRCS Range Management Specialist; Dennis Froemke, NRCS Range Management Specialist; Jeff Printz, NRCS State Range Management Specialist; Josh Saunders, NRCS Range Management Specialist; Kevin Sedivec, Extension Rangeland Management Specialist; Darrell Vanderbusch, NRCS Resource Soil Scientist; and Lee Voigt, NRCS Range Management Specialist.

<u>Data Source</u>	<u>Number of Records</u>	<u>Sample Period</u>	<u>State</u>	<u>County</u>
SCS-RANGE-417	1	1969	ND	Emmons

State Correlation

This site has been correlated with North Dakota and South Dakota in MLRA 53B.

Field Offices

Aberdeen, SD	Gettysburg, SD	Minot, ND	Steele, ND
Ashley, ND	Ipswich, SD	Mohall, ND	Towner, ND
Bismarck, ND	Jamestown, ND	Mound City, SD	Turtle Lake, ND
Bowbells, ND	LaMoure, ND	Napoleon, ND	Watford City, ND
Ellendale, ND	Leola, SD	Redfield, SD	Williston, ND
Faulkton, SD	Linton, ND	Selby, SD	
Garrison, ND	McClusky, ND	Stanley, ND	

Relationship to Other Established Classifications

Level IV Ecoregions of the Conterminous United States: 42a – Missouri Coteau; 42b – Collapsed Glacial Outwash; 42c – Missouri Coteau Slope; 42d – Northern Missouri Coteau; 42f – Southern Missouri Coteau Slope; 42g – Ponca Plains; and 42h – Southern River Breaks.

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.

Site Type: Rangeland
MLRA: 53B – Central Dark Brown Glaciated Plains

Very Shallow
R053BY017ND

USDA, NRCS, Various Published Soil Surveys.

Site Description Approval

ND, State Range Management Specialist Date

SD, State Range Management Specialist Date