

United States Department of Agriculture Natural Resources Conservation Service

Ecological Site Description

Site Name: Loamy Overflow

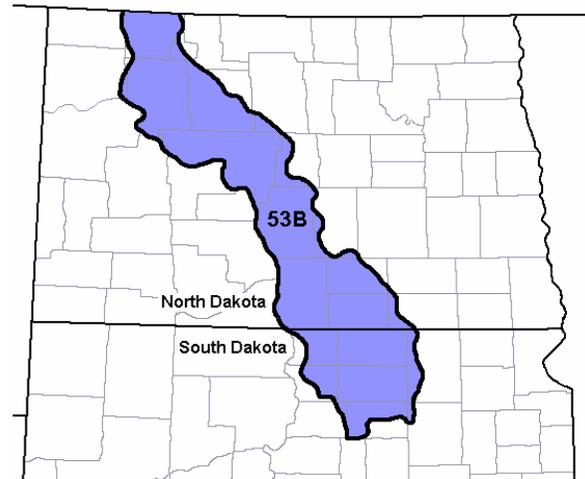
Site Type: Rangeland

Site ID: R053BY005ND

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 occurs on areas that receive additional water from overflow of intermittent streams or runoff from adjacent slopes.

Landform: till plain, swale, flood plain, terrace

Aspect: NA

	<u>Minimum</u>	<u>Maximum</u>
Elevation (feet):	1600	2000
Slope (percent):	0	3
Water Table Depth (inches):	36	80
Flooding:		
Frequency:	None	Frequent
Duration:	None	Brief
Ponding:		
Depth (inches):	None	None
Frequency:	None	None
Duration:	None	None
Runoff Class:	Negligible	Medium

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

Stream Type: C6 (Rosgen System)

Representative Soil Features

These are deep and very deep, moderately well and well drained, moderately coarse to fine textured soils. Saturated hydraulic conductivity is moderate to slow and available water capacity is moderate to high. Salinity is none to very slight and sodicity is none. This site is in swale positions that regularly receive additional run-on from surrounding uplands or flooding. These soils occur on swales, terraces, and footslopes on lake plains, residual uplands, till plains, and frequently flooded

stream terraces and flood plains. Slope ranges from zero to three percent. 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.

These soils are mainly susceptible to water erosion. The hazard of water erosion increases where vegetative cover is not adequate. 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 Field Office Technical Guide or the following Web sites:
<http://www.nrcs.usda.gov/technical/efotg/>.

Parent Material Kind: alluvium
Parent Material Origin: sedimentary, unspecified
Surface Texture: loam, silt loam, silty clay loam
Surface Texture Modifier: none
Subsurface Texture Group: loamy
Surface Fragments ≤3" (% Cover): 0-10
Surface Fragments >3" (%Cover): 0-5
Subsurface Fragments ≤3" (% Volume): 0-30
Subsurface Fragments > 3" (% Volume): 0-5

	<u>Minimum</u>	<u>Maximum</u>
Drainage Class:	moderately well	well
Permeability Class:	slow	moderately rapid
Depth to first restrictive layer (inches):	80	80
Electrical Conductivity (mmhos/cm)*:	0	4
Sodium Absorption Ratio*:	0	2
Soil Reaction (1:1 Water)*:	6.1	8.4
Soil Reaction (0.1M CaCl₂)*:	NA	NA
Available Water Capacity (inches)*:	6	8
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:

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 stable. Under continued adverse impacts, a slow decline in vegetative vigor and composition will occur. Under favorable vegetative management treatments, the site can quickly return to the Historic Climax Plant Community (HCPC).

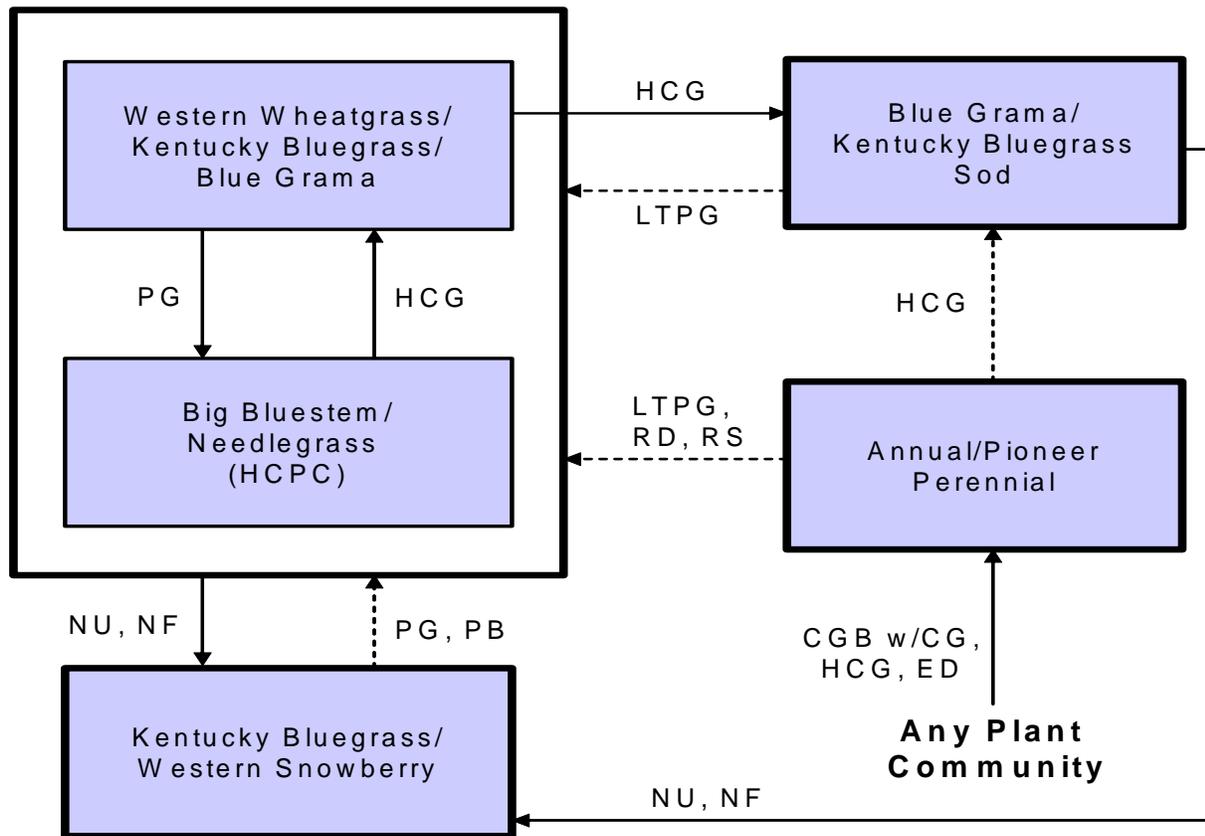
The plant community upon which interpretations are primarily based is the HCPC. The HCPC has been determined by study of rangeland relic areas, areas protected from excessive disturbance, and areas under long-term rotational grazing regimes. Trends in plant community dynamics ranging from heavily grazed 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 western wheatgrass and blue grama will initially increase. Big bluestem, green needlegrass, and sideoats grama will decrease in frequency and production. In time, heavy continuous grazing will likely cause blue grama to dominate the site and then this plant community is relatively stable and the competitive advantage prevents other species from establishing. This plant community is less productive than the HCPC. Runoff increases and infiltration will decrease. Soil erosion will be minimal.

Extended periods of non-use and/or lack of fire will result in a plant community having high litter levels, which favors an increase in Kentucky bluegrass and/or smooth brome. In time, shrubs such as western snowberry and chokecherry will likely increase and then dominate the site.

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



CGB w/CG – Cropped go-back with continuous grazing; **ED** – Excessive defoliation; **HCG** – Heavy continuous grazing; **HCPC** – Historic Climax Plant Community; **LTPG** – Long-term prescribed grazing; **NU, NF** – Non-use, no fire; **PB** – Prescribed burning followed by prescribed grazing; **PG** – Prescribed grazing with adequate recovery opportunity; **RS** – Range seeding followed by prescribed grazing; **RD** – Removal of disturbance.

Plant Community Composition and Group Annual Production

		Big Bluestem/Needlegrass (HCPC)			
COMMON/GROUP NAME	SYMBOL	Group	lbs./acre	% Comp	
GRASSES & GRASS-LIKES			2975 - 3325	85 - 95	
TALL WARM-SEASON		1	875 - 1225	25 - 35	
big bluestem	ANGE	1	700 - 1050	20 - 30	
switchgrass	PAVI2	1	175 - 350	5 - 10	
Indiangrass	SONU2	1	35 - 70	1 - 2	
NEEDLEGRASS		2	350 - 525	10 - 15	
green needlegrass	NAVI4	2	70 - 350	2 - 10	
porcupine grass	HESP11	2	70 - 350	2 - 10	
WHEATGRASS		3	280 - 420	8 - 12	
western wheatgrass	PASM	3	175 - 350	5 - 10	
slender wheatgrass	ELTRT	3	35 - 70	1 - 2	
bearded wheatgrass	ELTRS	3	35 - 70	1 - 2	
MID WARM-SEASON		4	70 - 175	2 - 5	
sideoats grama	BOCU	4	35 - 175	1 - 5	
little bluestem	SCSC	4	35 - 175	1 - 5	
OTHER NATIVE GRASSES		5	70 - 210	2 - 6	
blue grama	BOGR2	5	35 - 70	1 - 2	
green muhly	MURA	5	35 - 70	1 - 2	
Canada wildrye	ELCA4	5	35 - 70	1 - 2	
prairie dropseed	SPHE	5	35 - 70	1 - 2	
needleandthread	HECOC8	5	35 - 70	1 - 2	
other perennial grasses	2GP	5	35 - 70	1 - 2	
GRASS-LIKES		6	105 - 175	3 - 5	
Penn sedge	CAPE6	6	70 - 175	2 - 5	
fescue sedge	CABR10	6	35 - 70	1 - 2	
other grass-likes	2GL	6	35 - 105	1 - 3	
FORBS		7	175 - 350	5 - 10	
American licorice	GLLE3	7	35 - 70	1 - 2	
American vetch	VIAM	7	35 - 70	1 - 2	
fleabane	ERIGE2	7	35 - 70	1 - 2	
downy gentian	GEPU5	7	35 - 105	1 - 3	
cudweed sagewort	ARLU	7	35 - 105	1 - 3	
Flodman's thistle	CIFL	7	0 - 35	0 - 1	
goldenrod	SOLID	7	35 - 70	1 - 2	
heartleaf alexanders	ZIAP	7	0 - 35	0 - 1	
heath aster	SYER	7	35 - 70	1 - 2	
Indian hemp	APCA	7	35 - 70	1 - 2	
Maximilian sunflower	HEMA2	7	35 - 70	1 - 2	
meadow anemone	ANCA8	7	35 - 35	1 - 1	
northern bedstraw	GABO2	7	0 - 35	0 - 1	
purple prairie clover	DAPU5	7	35 - 70	1 - 2	
silverleaf scurfpea	PEAR6	7	0 - 35	0 - 1	
western yarrow	ACMI2	7	35 - 70	1 - 2	
other perennial forbs	2FP	7	0 - 70	0 - 2	
SHRUBS		8	175 - 350	5 - 10	
chokecherry	PRVI	8	35 - 70	1 - 2	
golden currant	RIAU	8	35 - 70	1 - 2	
hawthorn	CRATA	8	35 - 70	1 - 2	
juneberry	AMAL2	8	35 - 70	1 - 2	
leadplant	AMCA6	8	0 - 70	0 - 2	
prairie rose	ROAR3	8	35 - 70	1 - 2	
western snowberry	SYOC	8	70 - 175	2 - 5	
wild plum	PRAM	8	35 - 70	1 - 2	
other shrubs	2SHRUB	8	0 - 105	0 - 3	
TREES		9	35 - 70	1 - 2	
American elm	ULAM	9	0 - 35	0 - 1	
boxelder	ACNE2	9	0 - 35	0 - 1	
hackberry	CEOC	9	0 - 35	0 - 1	
green ash	FRPE	9	35 - 70	1 - 2	
other trees	2TREE	9	0 - 70	0 - 2	
Annual Production lbs./acre			LOW	RV	HIGH
GRASSES & GRASS-LIKES			2430 -	2923	-3475
FORBS			170 -	263	-375
SHRUBS			170 -	263	-375
TREES			30 -	53	-75
TOTAL			2800 -	3500	-4300

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	Big Bluestem/Needlegrass (HCPC)			Western Wheatgrass/Kentucky Bluegrass/Blue Grama			Blue Grama/Kentucky Bluegrass/Sod			Kentucky Bluegrass/Western Snowberry		
		Grp	lbs./acre	% Comp	Grp	lbs./acre	% Comp	Grp	lbs./acre	% Comp	Grp	lbs./acre	% Comp
GRASSES & GRASS-LIKES			2800 - 3150	80 - 90		2000 - 2250	80 - 90		1440 - 1620	80 - 90		1820 - 2380	65 - 85
TALL WARM-SEASON		1	875 - 1225	25 - 35	1	50 - 125	2 - 5	1	0 - 36	0 - 2	1	0 - 140	0 - 5
big bluestem	ANGE	1	700 - 1050	20 - 30	1	50 - 125	2 - 5	1	0 - 36	0 - 2	1	0 - 140	0 - 5
switchgrass	PAV12	1	175 - 350	5 - 10	1	0 - 25	0 - 1				1	0 - 28	0 - 1
Indiangrass	SONU2	1	35 - 70	1 - 2									
NEEDLEGRASS		2	350 - 525	10 - 15	2	25 - 75	1 - 3	2	0 - 36	0 - 2	2	28 - 140	1 - 5
green needlegrass	NAV14	2	70 - 350	2 - 10	2	25 - 75	1 - 3	2	0 - 36	0 - 2	2	28 - 140	1 - 5
porcupine grass	HESP11	2	70 - 350	2 - 10	2	0 - 25	0 - 1				2	0 - 84	0 - 3
WHEATGRASS		3	280 - 420	8 - 12	3	125 - 500	5 - 20	3	90 - 270	5 - 15	3	56 - 280	2 - 10
western wheatgrass	PASM	3	175 - 350	5 - 10	3	125 - 500	5 - 20	3	36 - 270	2 - 15	3	28 - 140	1 - 5
slender wheatgrass	ELTR7	3	35 - 350	1 - 10	3	0 - 250	0 - 10	3	0 - 180	0 - 10	3	0 - 280	0 - 10
bearded wheatgrass	ELTRS	3	35 - 350	1 - 10	3	0 - 250	0 - 10	3	0 - 180	0 - 10	3	0 - 280	0 - 10
MID WARM-SEASON		4	70 - 175	2 - 5	4	0 - 50	0 - 2	4	0 - 36	0 - 2	4		
sideoats grama	BOCU	4	35 - 175	1 - 5	4	0 - 50	0 - 2	4	0 - 36	0 - 2			
little bluestem	SCSC	4	35 - 175	1 - 5	4	0 - 25	0 - 1						
OTHER NATIVE GRASSES		5	70 - 210	2 - 6	5	250 - 625	10 - 25	5	270 - 540	15 - 30	5	28 - 140	1 - 5
blue grama	BOGR2	5	35 - 70	1 - 2	5	125 - 500	5 - 20	5	270 - 540	15 - 30	5	0 - 140	0 - 5
green muhly	MURA	5	35 - 70	1 - 2	5	0 - 25	0 - 1				5	0 - 84	0 - 3
Canada wildrye	ELCA4	5	35 - 70	1 - 2	5	0 - 26	0 - 1				5	0 - 84	0 - 3
dropseed	SPORO	5	35 - 70	1 - 2	5	0 - 125	0 - 5	5	0 - 90	0 - 5	5	0 - 140	0 - 5
needleandthread	HECOC8	5	35 - 140	1 - 4	5	25 - 250	1 - 10	5	0 - 54	0 - 3	5	0 - 140	0 - 5
other perennial grasses	ZGP	5	35 - 105	1 - 3	5	0 - 125	0 - 5	5	0 - 54	0 - 3	5	0 - 140	0 - 5
GRASS-LIKES		6	70 - 175	2 - 5	6	25 - 100	1 - 4	6	18 - 54	1 - 3	6	28 - 84	1 - 3
Penn sedge	CAPE6	6	70 - 175	2 - 5	6	25 - 75	1 - 3	6	18 - 54	1 - 3	6	28 - 84	1 - 3
fescue sedge	CABR10	6	35 - 70	1 - 2	6	0 - 50	0 - 2	6	0 - 18	0 - 1	6	0 - 84	0 - 3
other grass-like	ZGL	6	35 - 105	1 - 3	6	0 - 75	0 - 3	6	0 - 54	0 - 3	6	0 - 84	0 - 3
NON-NATIVE GRASSES		7			7	125 - 500	5 - 20	7	180 - 450	10 - 25	7	420 - 980	15 - 35
Kentucky bluegrass	POPR				7	125 - 500	5 - 20	7	90 - 450	5 - 25	7	140 - 980	5 - 35
smooth bromegrass	BRIN2				7	50 - 375	2 - 15	7	36 - 270	2 - 15	7	56 - 560	2 - 20
cheatgrass	BRTE				7	25 - 250	1 - 10	7	0 - 90	0 - 5	7	0 - 224	0 - 8
FORBS		8	175 - 350	5 - 10	8	125 - 375	5 - 15	8	90 - 270	5 - 15	8	140 - 420	5 - 15
American licorice	GLLE3	8	35 - 70	1 - 2	8	0 - 50	0 - 2				8	0 - 84	0 - 3
American vetch	VIAM	8	35 - 70	1 - 2	8	0 - 25	0 - 1						
Canada thistle	CIAR4				8	0 - 125	0 - 5	8	0 - 144	0 - 8	8	0 - 140	0 - 5
cocklebur	XANTH2				8	0 - 50	0 - 2	8	0 - 144	0 - 8	8	0 - 84	0 - 3
common dandelion	TAOF				8	25 - 75	1 - 3	8	18 - 90	1 - 5	8	28 - 140	1 - 5
cudweed sagewort	ARLU	8	35 - 105	1 - 3	8	25 - 100	1 - 4	8	18 - 90	1 - 5	8	28 - 112	1 - 4
curlycup gumweed	GRSQ				8	0 - 50	0 - 2	8	0 - 54	0 - 3	8	0 - 28	0 - 1
downy gentian	GEPU5	8	35 - 105	1 - 3							8	0 - 28	0 - 1
fleabane	ERGLP	8	35 - 70	1 - 2	8	0 - 25	0 - 1						
Flodman's thistle	CIFL	8	0 - 35	0 - 1	8	0 - 50	0 - 2	8	0 - 54	0 - 3	8	0 - 56	0 - 2
goldenrod	SOLID	8	35 - 70	1 - 2	8	25 - 75	1 - 3	8	18 - 54	1 - 3	8	28 - 112	1 - 4
heartleaf alexanders	ZIAP	8	0 - 35	0 - 1							8	0 - 28	0 - 1
heath aster	SYER	8	35 - 70	1 - 2	8	25 - 125	1 - 5	8	18 - 90	1 - 5	8	28 - 56	1 - 2
Indian hemp	APCA	8	35 - 70	1 - 2	8	25 - 75	1 - 3	8	18 - 54	1 - 3	8	28 - 112	1 - 4
Maximilian sunflower	HEMA2	8	35 - 70	1 - 2							8	0 - 56	0 - 2
meadow anemone	ANCA8	8	0 - 35	0 - 1							8	0 - 28	0 - 1
northern bedstraw	GABO2	8	0 - 35	0 - 1	8	0 - 50	0 - 2	8	0 - 18	0 - 1	8	0 - 28	0 - 1
purple prairie clover	DAPU5	8	35 - 70	1 - 2	8	25 - 50	1 - 2	8	18 - 36	1 - 2	8	0 - 28	0 - 1
silverleaf scurfpea	PEAR6	8	0 - 35	0 - 1	8	0 - 75	0 - 3	8	0 - 54	0 - 3	8	28 - 56	1 - 2
sweetclover	MELIL				8	0 - 125	0 - 5	8	0 - 90	0 - 5	8	0 - 280	0 - 10
western salsify	TRDU				8	0 - 75	0 - 3	8	0 - 54	0 - 3	8	28 - 140	1 - 5
western yarrow	ACMIO	8	35 - 70	1 - 2	8	25 - 75	1 - 3	8	18 - 54	1 - 3	8	0 - 56	0 - 2
other perennial forbs	ZFP	8	0 - 70	0 - 2	8	0 - 125	0 - 5	8	0 - 90	0 - 5	8	0 - 140	0 - 5
other annual forbs	ZFA				8	0 - 125	0 - 5	8	0 - 90	0 - 5	8	0 - 140	0 - 5
SHRUBS		9	175 - 350	5 - 10	9	25 - 125	1 - 5	9	18 - 90	1 - 5	9	280 - 560	10 - 20
chokecherry	PRV1	9	35 - 70	1 - 2	9	0 - 25	0 - 1				9	0 - 84	0 - 3
golden currant	RIAU	9	35 - 70	1 - 2							9	0 - 56	0 - 2
hawthorn	CRATA	9	35 - 70	1 - 2	9	0 - 25	0 - 1	9	0 - 18	0 - 1	9	0 - 84	0 - 3
juneberry	AMAL2	9	35 - 70	1 - 2	9	0 - 25	0 - 1				9	0 - 56	0 - 2
leadplant	AMCA6	9	0 - 70	0 - 2							9	0 - 28	0 - 1
prairie rose	ROAR3	9	35 - 70	1 - 2	9	25 - 100	1 - 4	9	18 - 90	1 - 5	9	28 - 140	1 - 5
western snowberry	SYOC	9	70 - 175	2 - 5	9	25 - 100	1 - 4	9	18 - 54	1 - 3	9	56 - 560	2 - 20
wild plum	PRAM	9	35 - 70	1 - 2	9	25 - 50	1 - 2	9	0 - 36	0 - 2	9	0 - 280	0 - 10
other shrubs	ZSHRUB	9	0 - 105	0 - 3	9	0 - 75	0 - 3	9	0 - 54	0 - 3	9	0 - 140	0 - 5
TREES		10	35 - 70	1 - 2	10	0 - 25	0 - 1	10	0 - 18	0 - 1	10	0 - 56	0 - 2
American elm	ULAM	10	0 - 35	0 - 1	10	0 - 25	0 - 1	10	0 - 18	0 - 1	10	0 - 56	0 - 2
boxelder	ACNE2	10	0 - 35	0 - 1	10	0 - 25	0 - 1	10	0 - 18	0 - 1	10	0 - 56	0 - 2
green ash	FRPE	10	35 - 70	1 - 2	10	0 - 25	0 - 1	10	0 - 18	0 - 1	10	0 - 56	0 - 2
hackberry	CEOC	10	0 - 35	0 - 1	10	0 - 25	0 - 1	10	0 - 18	0 - 1	10	0 - 56	0 - 2
other trees	ZTREE	10	0 - 70	0 - 2	10	0 - 25	0 - 1	10	0 - 18	0 - 1	10	0 - 56	0 - 2
Annual Production lbs./acre			LOW RV HIGH		LOW RV HIGH		LOW RV HIGH		LOW RV HIGH		LOW RV HIGH		LOW RV HIGH
GRASSES & GRASS-LIKES			2430 - 2923 - 3475		1680 - 2163 - 2640		1100 - 1557 - 1985		1845 - 2072 - 2290				
FORBS			170 - 263 - 375		120 - 250 - 400		85 - 180 - 300		135 - 280 - 450				
SHRUBS			170 - 263 - 375		20 - 75 - 130		15 - 54 - 95		220 - 420 - 600				
TREES			30 - 53 - 75		0 - 13 - 30		0 - 9 - 20		0 - 28 - 60				
TOTAL			2800 - 3500 - 4300		1800 - 2500 - 3200		1200 - 1800 - 2400		2200 - 2800 - 3400				

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.

Big Bluestem/Needlegrass 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 adequate recovery periods following each grazing event.

The potential vegetation is about 78 percent grasses and grass-like plants, 10 percent forbs, 10 percent shrubs, and 2 percent trees. Major grasses include big bluestem, green needlegrass, switchgrass, and western wheatgrass. Other grasses occurring on this community include blue grama, Canada wildrye, and porcupine grass. Major forbs and shrubs include American vetch, purple prairie clover, and western snowberry. Scattered green ash and American elm may occur.

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 properly. Plant litter is properly distributed with very little movement offsite and natural plant mortality is very low. The diversity in plant species allows for high drought tolerance. Runoff from adjacent sites and moderate or high available water capacity provides a favorable soil-water-plant relationship.

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: ND5304

Growth curve name: Missouri Coteau, 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	1	5	20	38	25	8	3	0	0	0

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

- Heavy continuous grazing without adequate recovery periods between grazing events will shift this plant community to the *Western Wheatgrass/Kentucky Bluegrass/Blue Grama Plant Community*.
- Non-use and no fire will move this plant community to the *Kentucky Bluegrass/Western Snowberry Plant Community*.

Western Wheatgrass/Kentucky Bluegrass/Blue Grama Plant Community

This plant community results from continuous 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. Western wheatgrass, Kentucky bluegrass and blue grama are the dominant species. Big bluestem and green needlegrass are greatly reduced. Sideoats grama has been removed. Forb species include western yarrow, asters, prairie coneflower, silverleaf scurfpea, and western ragweed. Shrub species would tend to be heavily browsed or damaged due to trampling.

This plant community is relatively stable and less productive than the HCPC. Reduction of litter and reduced plant vigor result in higher soil temperatures, poor water infiltration rates, increased runoff and high evapo-transpiration 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 Kentucky bluegrass and 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: 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:

- Heavy continuous grazing without adequate recovery between grazing events will move this plant community across an ecological threshold to the *Blue Grama/Kentucky Bluegrass Sod Plant Community*.
- Non-use and no fire will move this plant community to the *Kentucky Bluegrass/Western Snowberry Plant Community*.
- Prescribed grazing with adequate recovery periods following each grazing event and proper stocking will shift this plant community back to the *Big Bluestem/Needlegrass Plant Community (HCPC)*.

Blue Grama/Kentucky Bluegrass Sod Plant Community

This plant community developed with heavy continuous grazing without adequate recovery periods between grazing events. Blue grama and Kentucky bluegrass dominate the community and can develop into a “sodbound” appearance. Low vigor western wheatgrass can be found scattered throughout the community. Green needlegrass has been removed. Big bluestem may persist in minor amounts, greatly reduced in vigor and not readily seen. Rose pussytoes, western yarrow, silverleaf scurfpea, curlycup gumweed, and goldenrod have increased and/or invaded. Key shrubs have been severely reduced in vigor or removed completely.

This plant community is resistant to change due to grazing tolerance of Kentucky bluegrass and blue grama. A significant amount of production and diversity has been lost when compared to the HCPC. Loss of cool season grasses, tall warm season grasses, shrub component, and nitrogen fixing forbs have negatively impacted energy flow and nutrient cycling. Water infiltration is reduced significantly

due to the massive shallow root system (root pan), characteristic of "sodbound" blue grama and/or Kentucky bluegrass. Soil loss may be accelerated where concentrated flows occur.

It will take a very long time to restore this plant community back to the HCPC with improved management. Renovation would be very costly.

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 with adequate recovery periods following each grazing event and proper stocking over long periods of time can move this plant community toward the *Western Wheatgrass/Kentucky Bluegrass/Blue Grama Plant Community*. It may eventually return to the HCPC or associated successional plant community stages assuming an adequate seed/vegetative source is available. This process may take greater than 10 years.
- Non-use and no fire will move this plant community to the *Kentucky Bluegrass/Western Snowberry Plant Community*.

Kentucky Bluegrass/Western Snowberry Plant Community

This plant community develops after an extended period (10 to 20 years or more) of non-use and exclusion of fire. Eventually litter levels become high enough to reduce native grass vigor, diversity, and density. Kentucky bluegrass and/or smooth brome grass dominate this plant community. Common forbs include American licorice, cudweed sagewort, and silverleaf scurfpea. Shrubs such as western snowberry and chokecherry 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 HCPC. Soil erosion is low. Runoff is similar to the HCPC. Once the advanced stage of this plant community is reached, time and external resources will be needed to see 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 a normal year:

Growth curve number: ND5301

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

Growth curve description: Cool-season dominant.

JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
0	0	3	8	24	45	10	3	5	2	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 *Big Bluestem/Needlegrass 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 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 red threeawn, sixweeks fescue, smooth brome, crested wheatgrass, annual brome, needleandthread, prairie junegrass, western wheatgrass, and little bluestem. The dominant forbs include curlycup gumweed, marestalk, salsify, kochia, field bindweed, thistles, western ragweed, prostrate verbena, and other early successional species. Shrubs that may be present include prairie rose, fringed sage, and broom snakeweed. Plant species from adjacent ecological sites may become minor components of this plant community. The plant community is susceptible to invasion of 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 total annual production ranges from 500 to 1,500 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 the *Big Bluestem/Needlegrass Plant Community (HCPC)*. Depending on the slope, aspect, and size, and if adequate perennial plants exist, this change can occur more rapidly. This process will likely take a long period of time (25+ years).
- Range seeding with deferment and prescribed grazing can convert this to a plant community resembling the *Big Bluestem/Needlegrass Plant Community (HCPC)*.

Ecological Site Interpretations

Animal Community – Wildlife Interpretations

-- Under Development --

Big Bluestem/Needlegrass Plant Community:

Western Wheatgrass/Kentucky Bluegrass/Blue Grama Plant Community:

Blue Grama/Kentucky Bluegrass Sod Plant Community:

Kentucky Bluegrass/Western Snowberry 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-likes							
bearded 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
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
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
fescue sedge	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
green muhly	U D D U	N U N N	U D D U	N U N N	N U N N	U D D U	U D D 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
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
Penn sedge	U P U D	U P N D	U P U D	U D U D	U D U D	U P U D	U P 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 dropseed	N U P U	N U D U	N U P U	N U D U	N U D U	N U P U	N U P U
sideoats grama	U D P U	U P D U	U D P U	U P D U	U P D U	U D P U	U D P U
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
switchgrass	U D D U	U D U U	U D D U	N N N N	N N N N	U D D U	U D D U
western wheatgrass	U P D U	N D N N	U P D U	N D N N	N D N N	U P D U	U P D U
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
downy gentian	N 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
fleabane	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
Flodman's thistle	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
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
heartleaf alexanders	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
heath aster	U U D U	U U P U	U U D U	U U P U	U U P U	U U D U	U U P U
Indian hemp	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
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
meadow anemone	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 U U
northern bedstraw	N N N N	N U D N	N N N N	N U D N	N U D N	N N N N	N N N N
purple prairie clover	U D P U	U P P U	U D P U	U P P U	U P P U	U D P U	U P P U
silverleaf scurfspea	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
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
Shrubs							
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
hawthorn	N U U U	N D D U	N U U U	N D D U	N U D U	N U U U	N D D U
juneberry	N D P U	N D P U	N D P U	N D P U	N D P U	N D P U	N D P U
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
prairie rose	U D D U	U D D U	U D D U	U D D U	U D D U	U D D U	U D D U
western 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
wild 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
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
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

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 B, with localized areas in hydrologic group C. Infiltration and runoff potential for this site varies from negligible to moderate depending on soil hydrologic group 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 shortgrasses form a dense sod and dominate the site. Areas where ground cover is less than 50 percent have the greatest potential to have reduced infiltration and higher runoff (refer to Section 4, NRCS National Engineering Handbook for runoff quantities and hydrologic curves).

Recreational Uses

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

Wood Products

No appreciable wood products are present on the site.

Other Products

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

Supporting Information

Associated Sites

(053BY001ND) – Clayey	(053BY004ND) – Limy Subirrigated
(053BY011ND) – Loamy	(053BY012ND) – Subirrigated
(053BY008ND) – Loamy Terrace	(053BY019ND) – Wet Meadow

Similar Sites

(053BY012ND) – Subirrigated (Sb)

[Some what poorly drained soils with no evidence of lime or salts. Water table found at a depth of one and one-half to four feet from the soil surface at some point during the growing season. Found upslope from Wet Meadow sites and downslope of Loamy Overflow sites; can be in micro low or high positions within the listed associated sites. Indicator species are big bluestem intermixed with switchgrass and American licorice with shrubs like western snowberry. The site has more switchgrass, prairie cordgrass, less green needlegrass; higher production.]

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.

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.

USDA, NRCS, Various Published Soil Surveys.

Site Description Approval

ND, State Range Management Specialist Date

SD, State Range Management Specialist Date