

## United States Department of Agriculture Natural Resources Conservation Service

### Ecological Site Description

**Site Name:** Loamy

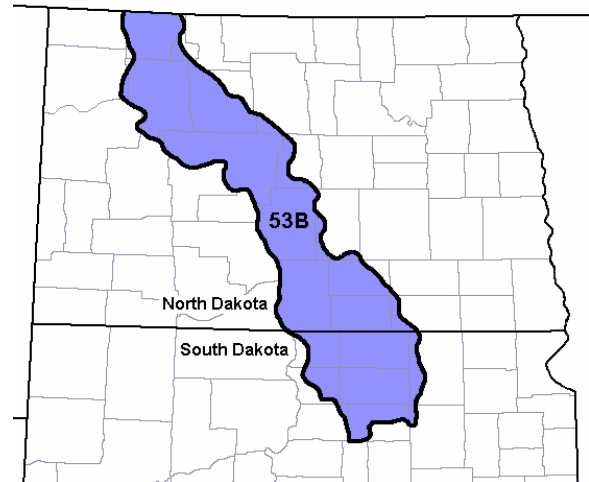
**Site Type:** Rangeland

**Site ID:** R053BY011ND

**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/](http://www.soilinfo.psu.edu/soil_lrr/).



### Physiographic Features

This site occurs on gently undulating to rolling and steep uplands.

**Landform:** till plain, terrace, lake plain

**Aspect:** NA

	<u>Minimum</u>	<u>Maximum</u>
<b>Elevation (feet):</b>	1600	2000
<b>Slope (percent):</b>	1	20
<b>Water Table Depth (inches):</b>	48	80
<b>Flooding:</b>		
<b>Frequency:</b>	None	None
<b>Duration:</b>	None	None
<b>Ponding:</b>		
<b>Depth (inches):</b>	None	None
<b>Frequency:</b>	None	None
<b>Duration:</b>	None	None
<b>Runoff Class:</b>	Low	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>
<b>Frost-free period (days):</b>	110	135
<b>Freeze-free period (days):</b>	129	156
<b>Mean Annual Precipitation (inches):</b>	15	20
<b>Average Monthly Precipitation (inches) and Temperature (°F):</b>		

	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 moderately deep to very deep, moderately well to well drained, medium, and moderately fine textured soils. Saturated hydraulic conductivity is moderate and available water capacity is moderate to high. Salinity is none to very slight and sodicity is none. This site occurs on nearly level to hilly till plains, terraces, and lake plains. Slope ranges from 1 to 20 percent. Some pedestalling of plants occurs, but it is not very evident on casual observation and occurs on less than 5 percent of the

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.

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 site:  
<http://www.nrcs.usda.gov/technical/efotg/>.

**Parent Material Kind:** till, alluvium, loess  
**Parent Material Origin:** siltstone, shale, mudstone  
**Surface Texture:** loam, silt loam, silty clay loam  
**Surface Texture Modifier:** none, stony, very stony, or extremely stony  
**Subsurface Texture Group:** loamy  
**Surface Fragments ≤3" (% Cover):** 0-25  
**Surface Fragments >3" (%Cover):** 0-45  
**Subsurface Fragments ≤3" (% Volume):** 0-50  
**Subsurface Fragments >3" (% Volume):** 0-20

	<u>Minimum</u>	<u>Maximum</u>
<b>Drainage Class:</b>	moderately well	well
<b>Permeability Class:</b>	moderate	moderate
<b>Depth to first restrictive layer (inches):</b>	20	80
<b>Electrical Conductivity (mmhos/cm)*:</b>	0	4
<b>Sodium Absorption Ratio*:</b>	0	5
<b>Soil Reaction (1:1 Water)*:</b>	6.1	8.4
<b>Soil Reaction (0.1M CaCl<sub>2</sub>)*:</b>	NA	NA
<b>Available Water Capacity (inches)*:</b>	5	9
<b>Calcium Carbonate Equivalent (percent)*:</b>	0	30

\* - 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 moderately resilient. Under continued adverse impacts, a slow decline in vegetative vigor and composition will occur. Under favorable vegetative management treatments, the site can readily 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

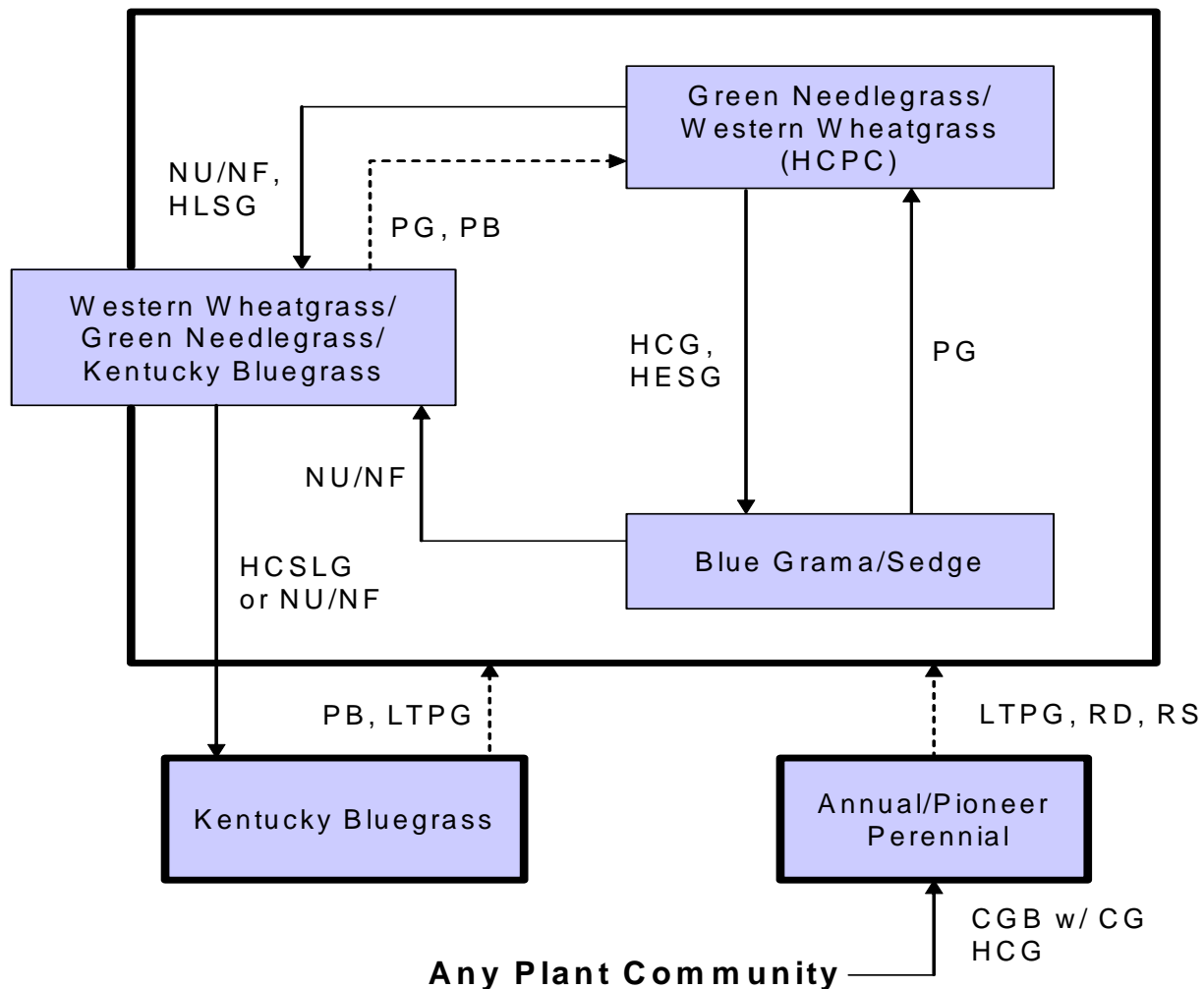
Heavy continuous grazing and/or continuous seasonal (spring) grazing, without adequate recovery periods following each grazing occurrence causes this site to depart from the HCPC. Blue grama will begin to increase. Western wheatgrass will increase initially and then begin to decrease. Green needlegrass will decrease in frequency and production. 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/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 grass. In time, shrubs such as western snowberry and chokecherry will likely increase.

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; **HCG** – Heavy continuous grazing; **HCPC** – Historical Climax Plant Community; **HCSLG** – Heavy continuous season-long grazing; **HESG** – Heavy early seasonal grazing; **HLSG** – Heavy late seasonal grazing; **LTPG** – Long-term prescribed grazing; **NU/NF** – Extended period of non-use & no fire; **PB** – Prescribed burning; **PG** – Prescribed grazing; **RD** – Removal of disturbance; **RS** – Range seeding with prescribed grazing.

### Plant Community Composition and Group Annual Production

COMMON/GROUP NAME	SYMBOL	Group	Green Needlegrass/ Western Wheatgrass (HCPC)		
			lbs./acre	% Comp	
<b>GRASSES &amp; GRASS-LIKES</b>			2040 - 2280	85 - 95	
<b>WHEATGRASS</b>		1	240 - 480	10 - 20	
western wheatgrass	PASM	1	240 - 480	10 - 20	
slender wheatgrass	ELTRT	1	120 - 360	5 - 15	
bearded wheatgrass	ELTRS	1	48 - 240	2 - 10	
<b>NEEDLEGRASS</b>		2	360 - 720	15 - 30	
green needlegrass	NAVI4	2	240 - 480	10 - 20	
needleandthread	HECOC8	2	120 - 240	5 - 10	
porcupine grass	HESP11	2	120 - 240	5 - 10	
Canadian needlegrass	HECU9	2	0 - 240	0 - 10	
<b>SHORT WARM-SEASON GRASSES</b>		3	120 - 240	5 - 10	
blue grama	BOGR2	3	120 - 240	5 - 10	
<b>TALL/MID WARM-SEASON GRASSES</b>		4	120 - 360	5 - 15	
big bluestem	ANGE	4	48 - 240	2 - 10	
sideoats grama	BOCU	4	48 - 240	2 - 10	
prairie dropseed	SPHE	4	0 - 120	0 - 5	
little bluestem	SCSC	4	0 - 120	0 - 5	
<b>OTHER NATIVE PERENNIALS</b>		5	48 - 120	2 - 5	
plains reedgrass	CAMO	5	24 - 120	1 - 5	
prairie junegrass	KOMA	5	24 - 72	1 - 3	
red threeawn	ARPUL	5	0 - 24	0 - 1	
other perennial grasses	2GP	5	0 - 72	0 - 3	
<b>GRASS-LIKES</b>		6	24 - 120	1 - 5	
needleleaf sedge	CADU6	6	24 - 120	1 - 5	
threadleaf sedge	CAFI	6	24 - 120	1 - 5	
other grass-likes	2GL	6	24 - 120	1 - 5	
<b>FORBS</b>		8	120 - 240	5 - 10	
American vetch	VIAM	8	24 - 48	1 - 2	
cudweed sagewort	ARLU	8	24 - 48	1 - 2	
green sagewort	ARDR4	8	0 - 24	0 - 1	
hairy goldaster	HEVI4	8	24 - 48	1 - 2	
heath aster	SYER	8	24 - 48	1 - 2	
goldenrod	SOLID	8	0 - 48	0 - 2	
prairie coneflower	RACO3	8	24 - 48	1 - 2	
purple prairie clover	DAPU5	8	24 - 48	1 - 2	
rush skeletonweed	LYJU	8	0 - 24	0 - 1	
scarlet globemallow	SPCO	8	0 - 24	0 - 1	
silverleaf scurfpea	PEAR6	8	24 - 48	1 - 2	
western yarrow	ACMI2	8	24 - 48	1 - 2	
western ragweed	AMPS	8	0 - 24	0 - 1	
western wallflower	ERCAC	8	0 - 24	0 - 1	
other native forbs	2FORB	8	0 - 72	0 - 3	
<b>SHRUBS</b>		9	24 - 120	1 - 5	
fringed sagewort	ARFR4	9	24 - 48	1 - 2	
leadplant	AMCA6	9	0 - 24	0 - 1	
prairie rose	ROAR3	9	0 - 24	0 - 1	
western snowberry	SYOC	9	24 - 48	1 - 2	
other shrubs	2SHRUB	9	0 - 48	0 - 2	
<b>Annual Production lbs./acre</b>			LOW	RV	HIGH
<b>GRASSES &amp; GRASS-LIKES</b>			1265 -	2148	- 3025
<b>FORBS</b>			115 -	180	- 250
<b>SHRUBS</b>			20 -	72	- 125
<b>TOTAL</b>			1400 -	2400	- 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.

**Plant Community Composition and Group Annual Production**

COMMON/GROUP NAME	SYMBOL	Green Needlegrass/ Western Wheatgrass (HCPC)			Western Wheatgrass/Green Needlegrass/Kentucky Bluegrass			Blue Grama/Sedge			Kentucky Bluegrass		
		Grp	lbs./acre	% Comp	Grp	lbs./acre	% Comp	Grp	lbs./acre	% Comp	Grp	lbs./acre	% Comp
<b>GRASSES &amp; GRASS-LIKES</b>			2040 - 2280	85 - 95		1520 - 1805	80 - 95		800 - 950	80 - 95		1200 - 1425	80 - 95
<b>WHEATGRASS</b>		1	240 - 480	10 - 20	1	190 - 380	10 - 20	1	10 - 80	1 - 8	1	30 - 150	2 - 10
western wheatgrass	PASM	1	120 - 480	5 - 20	1	95 - 380	5 - 20	1	10 - 80	1 - 8	1	30 - 150	2 - 10
slender wheatgrass	ELTR7	1	120 - 360	5 - 15	1	95 - 285	5 - 15	1	0 - 30	0 - 3	1	0 - 105	0 - 7
bearded wheatgrass	ELTRS	1	48 - 240	2 - 10	1	38 - 190	2 - 10	1	0 - 30	0 - 3	1	0 - 105	0 - 7
<b>NEEDLEGRASS</b>		2	360 - 720	15 - 30	2	95 - 285	5 - 15	2	10 - 70	1 - 7	2	15 - 120	1 - 8
green needlegrass	NAVI4	2	120 - 480	5 - 20	2	0 - 152	0 - 8	2	0 - 20	0 - 2	2	0 - 45	0 - 3
needleandthread	HECOC8	2	120 - 240	5 - 10	2	38 - 190	2 - 10	2	10 - 60	1 - 6	2	15 - 120	1 - 8
porcupine grass	HESP11	2	120 - 240	5 - 10	2	0 - 76	0 - 4						
Canadian needlegrass	HECU9	2	0 - 240	0 - 10	2	0 - 95	0 - 5	2	0 - 30	0 - 3	2	0 - 60	0 - 4
<b>SHORT WARM-SEASON</b>		3	120 - 240	5 - 10	3	38 - 152	2 - 8	3	150 - 300	15 - 30	3	15 - 75	1 - 5
blue grama	BOGR2	3	120 - 240	5 - 10	3	38 - 152	2 - 8	3	150 - 300	15 - 30	3	15 - 75	1 - 5
<b>TALL/MID WARM-SEASON</b>		4	120 - 360	5 - 15	4	0 - 95	0 - 5	4			4	0 - 30	0 - 2
big bluestem	ANGE	4	48 - 240	2 - 10	4	0 - 95	0 - 5				4	0 - 30	0 - 2
sideoats grama	BOCU	4	48 - 240	2 - 10	4	0 - 57	0 - 3				4	0 - 30	0 - 2
prairie dropseed	SPHE	4	0 - 120	0 - 5									
little bluestem	SCSC	4	0 - 120	0 - 5	4	0 - 19	0 - 1				4	0 - 15	0 - 1
<b>OTHER NATIVE PERENNIALS</b>		5	48 - 120	2 - 5	5	38 - 95	2 - 5	5	30 - 100	3 - 10	5	30 - 120	2 - 8
plains reedgrass	CAMO	5	24 - 120	1 - 5	5	0 - 57	0 - 3	5	0 - 10	0 - 1	5	0 - 15	0 - 1
prairie junegrass	KOMA	5	24 - 72	1 - 3	5	19 - 38	1 - 2	5	10 - 20	1 - 2	5	15 - 30	1 - 2
red threeawn	ARPUL	5	0 - 24	0 - 1	5	19 - 95	1 - 5	5	20 - 100	2 - 10	5	15 - 105	1 - 7
other perennial grasses	2GP	5	0 - 72	0 - 3	5	0 - 76	0 - 4	5	0 - 30	0 - 3	5	0 - 45	0 - 3
<b>GRASS-LIKES</b>		6	24 - 120	1 - 5	6	19 - 133	1 - 7	6	100 - 200	10 - 20	6	30 - 105	2 - 7
needleleaf sedge	CADU6	6	24 - 120	1 - 5	6	19 - 133	1 - 7	6	50 - 150	5 - 15	6	15 - 105	1 - 7
threadleaf sedge	CAFI	6	24 - 120	1 - 5	6	19 - 133	1 - 7	6	20 - 100	2 - 10	6	15 - 75	1 - 5
other grass-likes	2GL	6	24 - 120	1 - 5	6	0 - 95	0 - 5	6	0 - 30	0 - 3	6	0 - 75	0 - 5
<b>NON-NATIVE GRASSES</b>		7			7	95 - 285	5 - 15	7	20 - 50	2 - 5	7	300 - 600	20 - 40
Kentucky bluegrass	POPR				7	38 - 285	2 - 15	7	10 - 50	1 - 5	7	150 - 525	10 - 35
smooth bromegrass	BRIN2				7	0 - 190	0 - 10	7	0 - 30	0 - 3	7	30 - 375	2 - 25
crested wheatgrass	AGCR				7	0 - 95	0 - 5				7	0 - 150	0 - 10
cheatgrass	BRTE				7	0 - 95	0 - 5	7	10 - 40	1 - 4	7	0 - 150	0 - 10
<b>FORBS</b>		8	120 - 240	5 - 10	8	95 - 285	5 - 15	8	50 - 150	5 - 15	8	75 - 225	5 - 15
American vetch	VIAM	8	24 - 48	1 - 2	8	0 - 19	0 - 1						
cudweed sagewort	ARLU	8	24 - 48	1 - 2	8	19 - 57	1 - 3	8	10 - 30	1 - 3	8	15 - 60	1 - 4
curlycup gumweed	GRSQ				8	0 - 57	0 - 3	8	0 - 30	0 - 3	8	0 - 30	0 - 2
gayfeather	LIATR	8	24 - 48	1 - 2	8	19 - 38	1 - 2	8	0 - 10	0 - 1	8	15 - 30	1 - 2
goldenrod	SOLID	8	0 - 48	0 - 2	8	19 - 57	1 - 3	8	10 - 30	1 - 3	8	15 - 60	1 - 4
green sagewort	ARDR4	8	0 - 24	0 - 1	8	19 - 57	1 - 3	8	10 - 40	1 - 4	8	15 - 45	1 - 3
hairy goldaster	HEVI4	8	24 - 48	1 - 2	8	0 - 19	0 - 1						
heath aster	SYER	8	24 - 48	1 - 2	8	19 - 57	1 - 3	8	10 - 30	1 - 3	8	15 - 60	1 - 4
prairie coneflower	RACO3	8	24 - 48	1 - 2	8	19 - 38	1 - 2	8	0 - 10	0 - 1	8	0 - 15	0 - 1
purple prairie clover	DAPU5	8	24 - 48	1 - 2	8	0 - 19	0 - 1						
rush skeletonweed	LYJU	8	0 - 24	0 - 1	8	0 - 19	0 - 1	8	0 - 10	0 - 1	8	0 - 15	0 - 1
scarlet globemallow	SPCO	8	0 - 24	0 - 1	8	0 - 19	0 - 1	8	0 - 10	0 - 1	8	0 - 15	0 - 1
silverleaf scurfpea	PEAR6	8	24 - 48	1 - 2	8	19 - 57	1 - 3	8	10 - 30	1 - 3	8	15 - 45	1 - 3
sweetclover	MELIL				8	0 - 190	0 - 10	8	0 - 100	0 - 10	8	0 - 150	0 - 10
western ragweed	AMPS	8	0 - 24	0 - 1	8	0 - 57	0 - 3	8	0 - 20	0 - 2	8	0 - 45	0 - 3
western salsify	TRDU				8	0 - 57	0 - 3	8	0 - 20	0 - 2	8	0 - 60	0 - 4
western wallflower	ERCAC	8	0 - 24	0 - 1	8	0 - 19	0 - 1						
western yarrow	ACMIO	8	24 - 48	1 - 2	8	0 - 19	0 - 1	8	0 - 20	0 - 2	8	0 - 15	0 - 1
other native forbs	2FORB	8	0 - 120	0 - 5	8	0 - 95	0 - 5	8	0 - 50	0 - 5	8	0 - 75	0 - 5
non-native forbs	2FORB				8	0 - 95	0 - 5	8	0 - 80	0 - 8	8	0 - 120	0 - 8
<b>SHRUBS</b>		9	24 - 120	1 - 5	9	57 - 190	3 - 10	9	20 - 50	2 - 5	9	15 - 75	1 - 5
fringed sagewort	ARFR4	9	24 - 48	1 - 2	9	19 - 95	1 - 5	9	10 - 50	1 - 5	9	15 - 60	1 - 4
leadplant	AMCA6	9	0 - 48	0 - 2									
prairie rose	ROAR3	9	0 - 48	0 - 2	9	19 - 76	1 - 4	9	10 - 40	1 - 4	9	0 - 45	0 - 3
western snowberry	SYOC	9	24 - 72	1 - 3	9	19 - 152	1 - 8	9	0 - 30	0 - 3	9	0 - 75	0 - 5
other shrubs	2SHRUB	9	0 - 48	0 - 2	9	0 - 57	0 - 3	9	0 - 30	0 - 3	9	0 - 45	0 - 3
<b>Annual Production lbs./acre</b>			LOW RV HIGH		LOW RV HIGH		LOW RV HIGH		LOW RV HIGH		LOW RV HIGH		LOW RV HIGH
<b>GRASSES &amp; GRASS-LIKES</b>			1265 - 2148 - 3025		1055 - 1587 - 2105		440 - 865 - 1390		920 - 1305 - 1890				
<b>FORBS</b>			115 - 180 - 250		90 - 190 - 300		45 - 100 - 155		70 - 150 - 230				
<b>SHRUBS</b>			20 - 72 - 125		55 - 124 - 195		15 - 35 - 55		10 - 45 - 80				
<b>TOTAL</b>			1400 - 2400 - 3400		1200 - 1900 - 2600		500 - 1000 - 1600		1000 - 1500 - 2200				

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.

#### Green Needlegrass/Western Wheatgrass 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 85 percent grasses or grass-like plants, 10 percent forbs, and 5 percent shrubs. The plant community is dominated by western wheatgrass and green needlegrass. Other grasses and grass-like plants include needleandthread, blue grama, porcupine grass, bearded wheatgrass, and sedges. Significant forbs include American vetch, green sagewort, silverleaf scurfpea, and Missouri goldenrod. In many areas, western snowberry is the principal shrub and occurs in patchy mosaic. Other shrubs include prairie rose, leadplant, winterfat, and fringed sagewort.

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. Run-off 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: 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:

- Non-use and no fire for extended periods of time will convert this plant community to the *Western Wheatgrass/Green Needlegrass/Kentucky Bluegrass Plant Community*.
- Heavy, continuous grazing or heavy early seasonal grazing will convert this plant community to the *Blue Grama/Sedge Plant Community*.

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

### Blue Grama/Sedge Plant Community

This plant community is the result of heavy, continuous grazing and/or annual, early spring seasonal grazing. Repeated spring grazing depletes stored carbohydrates, resulting in weakening and eventual death of the cool season mid-grasses. Blue grama and sedge are the dominant species. Other grasses and grass-likes include western wheatgrass, needleandthread, prairie Junegrass, and annual grasses. Forbs such as western ragweed, scurfpea, cudweed sagewort, and scarlet globemallow may also be present. This plant community can occur throughout the pasture, on spot grazed areas, and around water sources where season-long grazing patterns occur.

This plant community is less productive than the HCPC. Lack of litter and reduced plant vigor result in higher soil temperatures, poor water infiltration rates, and high evapotranspiration, which gives blue grama a competitive advantage over cool season mid-grasses.

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 may cause further deterioration resulting in a shift to the *Annual/Pioneer Perennial Plant Community*.
- Non-use and no fire over an extended period of time may lead this plant community to the *Western Wheatgrass/Green Needlegrass/Kentucky Bluegrass Plant Community*. This shift may take considerably longer than the corresponding transition from HCPC, depending on how much residual cool-season mid-grasses are present upon initiation of non-use or fire exclusion.
- Prescribed grazing that includes changing season of use and allowing adequate recovery periods to enhance cool season grasses will lead this plant community back to the *Green Needlegrass/Western Wheatgrass Plant Community*.
- Cropped go-back land with continuous grazing will convert this plant community to the *Annual/Pioneer Perennial Plant Community*.

### Western Wheatgrass/Green Needlegrass/Kentucky Bluegrass Plant Community

This plant community develops after an extended period of non-use by herbivores and exclusion of fire. Non-native grasses, such as Kentucky bluegrass, crested wheatgrass, and smooth brome grass tend to invade. Western wheatgrass and green needlegrass are still the dominant grasses in the early stages of this transition. Other grasses present include porcupine grass, slender wheatgrass, blue grama, and needleandthread. The common forbs include sweetclover, green sagewort, cudweed sagewort, and American vetch. Western snowberry is the principal shrub and tends to increase in density and cover.



Litter buildup reduces plant vigor and density, and native seedling recruitment declines. Due to a lack of tiller stimulation and sunlight, native bunchgrasses typically develop dead centers and native rhizomatous grasses are limited to small colonies. This plant community is dispersed throughout the pasture, encircling spot grazed areas, and areas distant from water sources. This is a typical pattern found in properly stocked pastures grazed season-long.

This plant community is resistant to change without prescribed grazing or fire. The combination of both grazing and fire is most effective in moving this plant community towards the HCPC. Soil erosion is low. Runoff is similar to the HCPC. Once this plant community is reached, time and external resources will be needed to see any immediate recovery in diversity.

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 *Green Needlegrass/Western Wheatgrass Plant Community (HCPC)*. This would require long-term management with prescribed grazing and/or prescribed burning under controlled conditions.
- Heavy, continuous season-long grazing will likely move this plant community to the *Kentucky Bluegrass Plant Community*.
- Continued non-use and no fire over an extended period of time may lead this plant community to the *Kentucky Bluegrass Plant Community*.
- Cropped go-back land with continuous grazing will convert this plant community to the *Annual/Pioneer Perennial Plant Community*.

### **Kentucky Bluegrass Plant Community**

This plant community developed from continued heavy continuous season-long grazing without adequate recovery periods between grazing events or from continued non-use and no fire for extended periods of time. Kentucky bluegrass will tend to dominate this plant community; however, other non-native species such as smooth brome grass and crested wheatgrass may also become prevalent. Needlegrasses, big bluestem, sideoats grama, and prairie dropseed are absent or nearly so, and other grasses and grass-likes present include western wheatgrass, red threeawn, prairie Junegrass, and sedge. Forbs commonly found in this plant community include green sagewort, scurfpea, and sweet clover.

When this plant community is reached through extended periods of non-use and no fire, litter buildup reduces native plant vigor and density severely, and native seedling recruitment is rare. Due to a lack of tiller stimulation and sunlight, native bunchgrasses typically develop dead centers and native rhizomatous grasses are limited to small colonies. This plant community can be dispersed throughout

the pasture, encircling spot grazed areas, and areas distant from water sources. This is a sometimes found in properly stocked pastures grazed season long.

The following growth curve represents monthly percentages of total annual growth of the dominant species 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:

- Long-term prescribed grazing and/or prescribed burning followed by prescribed grazing may eventually move this plant community through successional stages leading towards the *Green Needlegrass/Western Wheatgrass Plant Community (HCPC)*. This would require long-term management under favorable climatic conditions.
- Cropped go-back land with continuous grazing will convert this plant community to the *Annual/Pioneer Perennial Plant Community*.
- Heavy continuous grazing will likely shift this plant community to the *Annual/Pioneer Perennial Plant Community*.

### 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, six-weeks fescue, smooth brome, crested wheatgrass, annual brome, needleandthread, prairie Junegrass, and western wheatgrass. The dominant forbs include curlycup gumweed, maretail, salsify, kochia, field bindweed, thistles, western ragweed, pussytoes, 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 community also is susceptible to invasion of Canada thistle and other non-native species due to severe soil disturbances and relatively high percent of bare ground. Compared to the HCPC, western wheatgrass, green needlegrass, porcupine grass, and blue grama have decreased. Many annual and perennial forbs, including non-native species, have invaded.

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. Total production is highly variable and can range from 400 to 1,400 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 *Green Needlegrass/Western Wheatgrass 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 (50+ years).
- Range seeding followed with prescribed grazing can be used to convert this plant community to one that may resemble the *HCPC*.

## **Ecological Site Interpretations**

### **Animal Community – Wildlife Interpretations**

-- Under Development --

**Green Needlegrass/Western Wheatgrass Plant Community:**

**Blue Grama/Sedge Plant Community:**

**Western Wheatgrass/Green Needlegrass/Kentucky Bluegrass Plant Community:**

**Kentucky Bluegrass Plant Community:**

**Annual/Pioneer Perennial:**

**Animal Preferences (Quarterly – 1,2,3,4<sup>†</sup>)**

Common Name	Cattle	Sheep	Horses	Deer	Antelope	Bison	Elk
<b>Grasses &amp; Grass-likes</b>							
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
Canadian 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
green needlegrass	U P U D	N P N P	U P U D	N P N P	N P N P	U P U D	U P U D
little bluestem	U D D U	N D N N	U D D U	N D N N	N D N N	U D D U	U D D U
needleandthread	U D U D	N D N U	U D U D	N D N U	N D N U	U D U D	U D U D
needleleaf 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
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
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
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
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
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
<b>Forbs</b>							
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
goldenrod	U U D U	N U U N	U U D U	N U U N	N U U N	U U D U	N U U N
green sagewort	U U U U	U U U U	U U U U	U U U U	U U U U	U U U U	U U U U
hairy goldaster	U U D U	N N N N	U U D U	N N N N	N N N N	U U D U	N N N N
heath aster	U U D U	U U P U	U U D U	U U P U	U U P U	U U D U	U U P U
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 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
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 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
silverleaf 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
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 wallflower	U D U U	N U U N	U D U U	N U U N	N U U N	U D 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
<b>Shrubs</b>							
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
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

**N** = not used; **U** = undesirable; **D** = desirable; **P** = preferred; **T** = toxic

<sup>†</sup> 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 groups B, with localized areas in hydrologic group C. Infiltration varies from moderately slow to moderately rapid and runoff potential varies from negligible to high for this site 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 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                      (053BY005ND) – Loamy Overflow   (053BY008ND) – Sandy  
(053BY002ND) – Claypan                (053BY009ND) – Shallow Loamy   (053BY015ND) – Thin Loamy

### Similar Sites

(053BY001ND) – Clayey (Cy)

[Does not receive additional moisture. Found on dry uplands, upslope from Loamy overflow sites, down slope from Thin Loamy or Shallow Loamy sites. Similar landscape position as Sandy, Sands, and Loamy sites. Will ribbon greater than two inches. Indicator species: dominated by green needlegrass and western wheatgrass. This site has more green needlegrass similar production, similar landscape position and different soil texture.]

(053BY002ND) – Claypan (Cp)

[Well drained soils on uplands or terraces that don't receive extra moisture with a dense sodic subsoil below 6 inches with salts below 16 inches. Indicator species are western wheatgrass with an understory of blue grama, heath aster, and western yarrow along with fringed sagewort and brittle cactus. This site has less production, less green needlegrass and shrubs, more blue grama, and a dense sodic subsoils layer above 20 inches.]

(053BY008ND) – Sandy (Sy)

[Does not receive additional moisture. Found on dry uplands upslope from Loamy Overflow sites, down slope from Shallow Loamy sites. Similar landscape position as

Loamy, Sands, Clayey sites; will ribbon up to one inch. Indicator species are prairie sandreed with western wheatgrass and green needlegrass intermixed. This site has prairie sandreed and sand bluestem; more needleandthread and sedges, less blue grama, green needlegrass and western wheatgrass, similar production, similar landscape position, different soil texture.]

## 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	7	1968 – 1969	ND	Burke, Emmons, Ward

## 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>)

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

**Loamy**  
**R053BY011ND**

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