

## United States Department of Agriculture Natural Resources Conservation Service

### Ecological Site Description

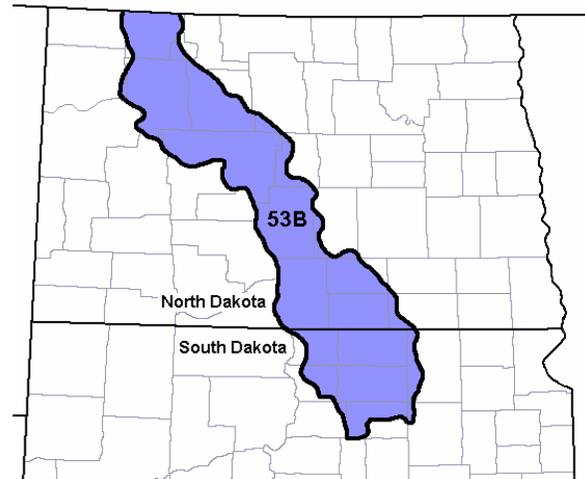
**Site Name:** Subirrigated

**Site Type:** Rangeland

**Site ID:** R053BY012ND

**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 nearly level, slightly concave and gently undulating lowlands.

**Landform:** till plain, lake plain, alluvial plain

**Aspect:** NA

	<u>Minimum</u>	<u>Maximum</u>
<b>Elevation (feet):</b>	1600	2000
<b>Slope (percent):</b>	0	3
<b>Water Table Depth (inches):</b>	18	42
<b>Flooding:</b>		
<b>Frequency:</b>	None	Occasional
<b>Duration:</b>	None	Very brief
<b>Ponding:</b>		
<b>Depth (inches):</b>	None	None
<b>Frequency:</b>	None	None
<b>Duration:</b>	None	None
<b>Runoff Class:</b>	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>
<b>Frost-free period (days):</b>	110	135
<b>Freeze-free period (days):</b>	129	156
<b>Mean Annual Precipitation (inches):</b>	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**

<b>Wetland Description:</b>	<u>System</u>	<u>Subsystem</u>	<u>Class</u>	<u>Sub-class</u>
Cowardin, et al., 1979	Palustrine	N/A	Emergent Wetland	Persistent

**Representative Soil Features**

These are very deep, somewhat poorly drained, coarse to moderately fine textured soils. Saturated hydraulic conductivity is moderate to moderately slow and available water capacity is low to high. Salinity is none to very slight and sodicity is none. These soils have a high water table (one and one-half to three and one-half feet from the surface) which keeps the rooting zone moist for most of the growing season. This site is on flats and swales on alluvial plains, lake plains and till plains. Slope ranges from zero to three percent. This site should show slight to no evidence of rills, wind scoured areas, or pedestalled plants. No water flow paths are seen on this site. The soil surface is stable and intact. Sub-surface soil layers are non-restrictive to water movement and root penetration.

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:** alluvium, lacustrine deposits, outwash

**Parent Material Origin:** mixed

**Surface Texture:** loam, silt loam, silty clay loam

**Surface Texture Modifier:** none

**Subsurface Texture Group:** loamy

**Surface Fragments ≤3" (% Cover):** 0

**Surface Fragments >3" (%Cover):** 0

**Subsurface Fragments ≤3" (% Volume):** 0-20

**Subsurface Fragments >3" (% Volume):** 0-5

	<u>Minimum</u>	<u>Maximum</u>
<b>Drainage Class:</b>	somewhat poorly	somewhat poorly
<b>Permeability Class:</b>	moderately slow	moderate
<b>Depth to first restrictive layer (inches):</b>	80	80
<b>Electrical Conductivity (mmhos/cm)*:</b>	0	4
<b>Sodium Absorption Ratio*:</b>	0	0
<b>Soil Reaction (1:1 Water)*:</b>	5.1	8.4
<b>Soil Reaction (0.1M CaCl<sub>2</sub>)*:</b>	NA	NA
<b>Available Water Capacity (inches)*:</b>	4	7
<b>Calcium Carbonate Equivalent (percent)*:</b>	0	20

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

## Plant Communities

### Ecological Dynamics of the Site:

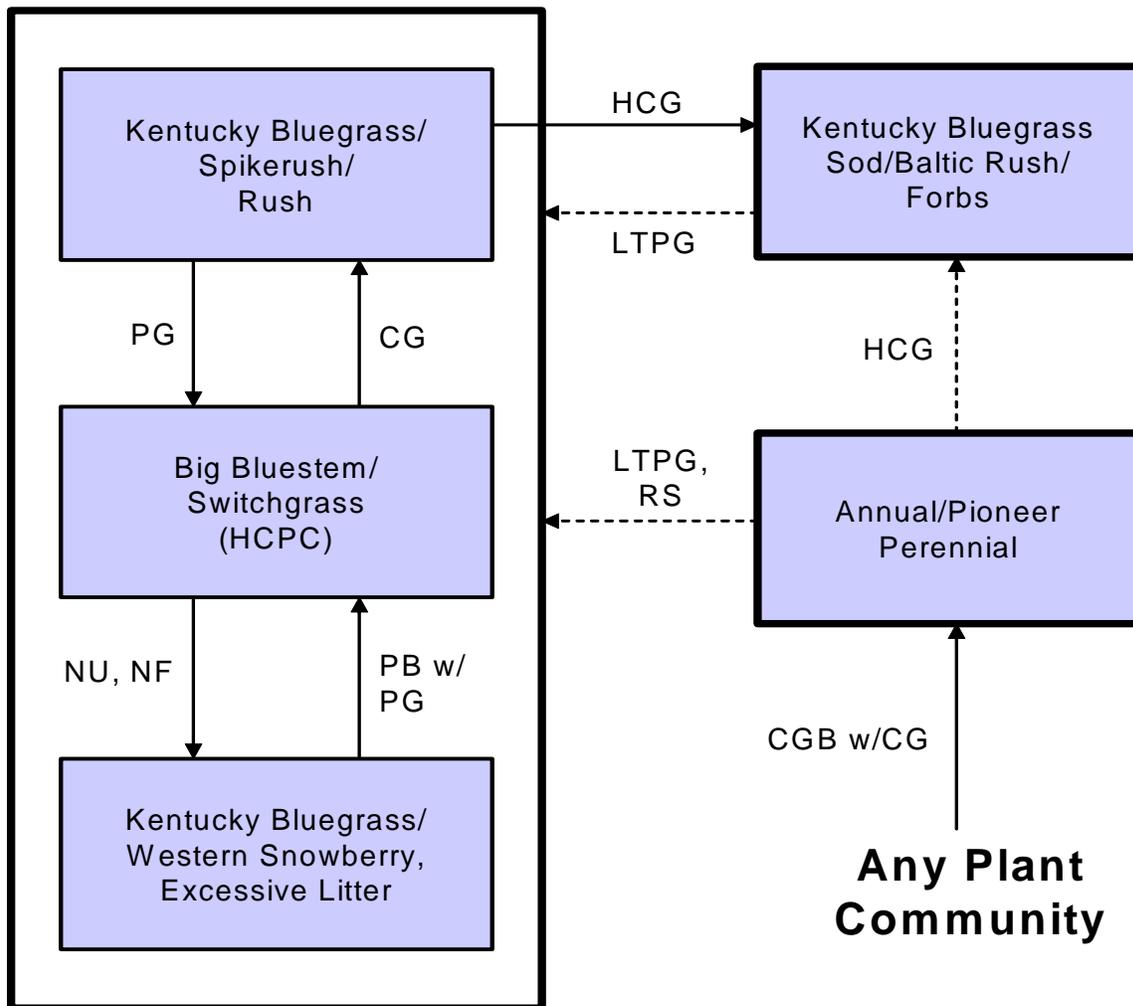
The site developed under Northern Great Plains climatic conditions, and included natural influence of large herbivores and occasional fire. Changes will occur in the plant communities due to climatic conditions and/or management actions. Due to the nature of the soils along with the high productivity of the subirrigated plants, this site is considered 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.

As changes occur from continuous grazing without adequate recovery opportunities between grazing events, species such as Kentucky bluegrass, western wheatgrass, and Baltic rush will invade or increase. Kentucky bluegrass may eventually form a dense sod. Grasses such as big bluestem, prairie cordgrass, and switchgrass will decrease in frequency and production and can be removed from the site. Non-use and lack of fire will cause litter levels and plant decadence or mortality to increase. Under extended periods of non-use and/or lack of fire, both invading grass and forb species such as Kentucky bluegrass, fowl bluegrass, sweet clover, and possibly Canada thistle will dominate the site along with a heavy increase of shrubs and trees including invading trees such as Russian olive. This will eventually result in a wooded plant community.

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



**CG** – Continuous grazing without adequate recovery opportunity;  
**CGB w/CG** – Cropped go-back with continuous grazing; **HCG** – Heavy continuous grazing; **HCPC** – Historic Climax Plant Community; **LTPG** – Long-term prescribed grazing; **NU, NF** – Non-use, no fire; **PB** – Prescribed burning; **PG** – Prescribed grazing with adequate recovery opportunity; **RS** – Range seeding followed by prescribed grazing.

**Plant Community Composition and Group Annual Production**

		Big Bluestem/Switchgrass (HCPC)			
COMMON/GROUP NAME	SYMBOL	Group	lbs./acre	% Comp	
<b>GRASSES &amp; GRASS-LIKES</b>			3500 - 4000	70 - 80	
<b>WARM-SEASON GRASSES</b>		1	2000 - 2500	40 - 50	
big bluestem	ANGE	1	1250 - 2250	25 - 45	
switchgrass	PAV12	1	250 - 1000	5 - 20	
Indiangrass	SONU2	1	250 - 750	5 - 15	
little bluestem	SCSC	1	0 - 500	0 - 10	
prairie cordgrass	SPPE	1	0 - 250	0 - 5	
<b>MID COOL-SEASON</b>		2	250 - 500	5 - 10	
green needlegrass	NAVI4	2	0 - 150	0 - 3	
northern reedgrass	CAST13	2	150 - 250	3 - 5	
porcupine grass	HESP11	2	0 - 150	0 - 3	
western wheatgrass	PASM	2	100 - 150	2 - 3	
<b>OTHER NATIVE GRASSES</b>		3	150 - 250	3 - 5	
bearded wheatgrass	ELTRS	3	50 - 100	1 - 2	
Canada wildrye	ELCA4	3	50 - 100	1 - 2	
slender wheatgrass	ELTRT	3	50 - 100	1 - 2	
other perennial grasses	2GP	3	0 - 250	0 - 5	
<b>GRASS-LIKES</b>		4	150 - 250	3 - 5	
Baltic rush	JUBA	4	50 - 100	1 - 2	
common spikerush	ELPA3	4	50 - 100	1 - 2	
fescue sedge	CABR10	4	50 - 100	1 - 2	
Penn sedge	CAPE6	4	100 - 150	2 - 3	
woolly sedge	CAPE42	4	50 - 100	1 - 2	
other grass-likes	2GL	4	50 - 100	1 - 2	
<b>FORBS</b>		5	250 - 500	5 - 10	
American licorice	GLLE3	5	50 - 100	1 - 2	
American vetch	VIAM	5	0 - 50	0 - 1	
anemone	ANEMO	5	0 - 50	0 - 1	
Canada goldenrod	SOCA6	5	50 - 100	1 - 2	
catnip	NECA2	5	0 - 50	0 - 1	
cinquefoil	POTEN	5	0 - 50	0 - 1	
dogbane	APOCY	5	0 - 50	0 - 1	
downy gentian	GEPU5	5	0 - 50	0 - 1	
Flodman's thistle	CIFL	5	0 - 50	0 - 1	
heartleaf Alexanders	ZIAP	5	50 - 100	1 - 2	
Maximilian sunflower	HEMA2	5	50 - 100	1 - 2	
mint	MENTH	5	50 - 100	1 - 2	
northern bedstraw	GABO2	5	0 - 50	0 - 1	
western yarrow	ACMI2	5	50 - 100	1 - 2	
white prairie aster	SYFA	5	50 - 100	1 - 2	
wood lily	LIPH	5	0 - 50	0 - 1	
other perennial forbs	2FP	5	0 - 150	0 - 3	
<b>SHRUBS</b>		6	250 - 500	5 - 10	
American plum	PRAM	6	0 - 50	0 - 1	
chokecherry	PRVI	6	100 - 150	2 - 3	
false indigo	AMFR	6	50 - 100	1 - 2	
juneberry	AMAL2	6	100 - 150	2 - 3	
Missouri gooseberry	RIMI	6	50 - 100	1 - 2	
prairie rose	ROAR3	6	50 - 100	1 - 2	
Redosier dogwood	COSE16	6	50 - 100	1 - 2	
western snowberry	SYOC	6	200 - 250	4 - 5	
willow	SALIX	6	100 - 250	2 - 5	
other shrubs	2SHRUB	6	0 - 250	0 - 5	
<b>TREES</b>		7	250 - 500	5 - 10	
American elm	ULAM	7	0 - 50	0 - 1	
boxelder	ACNE2	7	0 - 50	0 - 1	
green ash	FRPE	7	50 - 150	1 - 3	
peachleaf willow	SAAM2	7	50 - 150	1 - 3	
plains cottonwood	PODEM	7	0 - 150	0 - 3	
other native trees	2TREE	7	0 - 150	0 - 3	
<b>Annual Production lbs./acre</b>			LOW	RV	HIGH
<b>GRASSES &amp; GRASS-LIKES</b>			3340 -	3875	-4350
<b>FORBS</b>			220 -	375	-550
<b>SHRUBS</b>			220 -	375	-550
<b>TREES</b>			220 -	375	-550
<b>TOTAL</b>			4000 -	5000	-6000

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/Switchgrass (HCPC)			Kentucky Bluegrass/Spikerush/Rush			Kentucky Bluegrass/Sod/Baltic Rush/Forbs			Kentucky Bluegrass/Western Snowberry, Excessive Litter		
		Grp	lbs./acre	% Comp	Grp	lbs./acre	% Comp	Grp	lbs./acre	% Comp	Grp	lbs./acre	% Comp
<b>GRASSES &amp; GRASS-LIKES</b>													
<b>WARM-SEASON GRASSES</b>		1	2000 - 2500	40 - 50	1	90 - 240	3 - 8	1	0 - 69	0 - 3	1	40 - 160	1 - 4
big bluestem	ANGE	1	1250 - 2250	25 - 45	1	60 - 150	2 - 5	1	0 - 69	0 - 3	1	40 - 160	1 - 4
switchgrass	PAV12	1	250 - 1000	5 - 20	1	30 - 90	1 - 3	1	0 - 46	0 - 2	1	0 - 40	0 - 1
Indiangrass	SONU2	1	250 - 750	5 - 15									
little bluestem	SCSC	1	0 - 500	0 - 10	1	0 - 150	0 - 5				1	0 - 80	0 - 2
prairie cordgrass	SPPE	1	0 - 250	0 - 5	1	0 - 90	0 - 3				1	0 - 40	0 - 1
<b>MID COOL-SEASON GRASSES</b>		2	250 - 500	5 - 10	2	90 - 420	3 - 14	2	23 - 115	1 - 5	2	40 - 200	1 - 5
green needlegrass	NAV14	2	0 - 150	0 - 3	2	0 - 60	0 - 2				2	0 - 120	0 - 3
northern reedgrass	CAST3	2	150 - 250	3 - 5	2	30 - 90	1 - 3				2	0 - 40	0 - 1
porcupine grass	HESP11	2	0 - 150	0 - 3	2	0 - 30	0 - 1				2	0 - 40	0 - 1
western wheatgrass	PASM	2	100 - 150	2 - 3	2	60 - 300	2 - 10	2	23 - 115	1 - 5	2	40 - 200	1 - 5
<b>OTHER NATIVE GRASSES</b>		3	150 - 250	3 - 5	3	90 - 240	3 - 8	3	0 - 69	0 - 3	3	0 - 160	0 - 4
bearded wheatgrass	ELTRS	3	50 - 100	1 - 2	3	30 - 120	1 - 4				3	0 - 80	0 - 2
Canada wildrye	ELCA4	3	50 - 100	1 - 2	3	30 - 90	1 - 3				3	0 - 120	0 - 3
slender wheatgrass	ELTR7	3	50 - 100	1 - 2	3	30 - 120	1 - 4				3	0 - 80	0 - 2
other perennial grasses	2GP	3	0 - 250	0 - 5		0 - 90	0 - 3	3	0 - 69	0 - 3	3	0 - 80	0 - 2
<b>GRASS-LIKES</b>		4	150 - 250	3 - 5	4	450 - 750	15 - 25	4	69 - 460	3 - 20	4	80 - 280	2 - 7
Baltic rush	JUBA	4	50 - 100	1 - 2	4	150 - 450	5 - 15	4	46 - 460	2 - 20	4	40 - 120	1 - 3
common spikerush	ELPA3	4	50 - 100	1 - 2	4	150 - 450	5 - 15	4	23 - 230	1 - 10	4	40 - 160	1 - 4
fescue sedge	CABR10	4	50 - 100	1 - 2	4	30 - 90	1 - 3	4	0 - 23	0 - 1	4	0 - 120	0 - 3
Penn sedge	CAPE6	4	100 - 150	2 - 3	4	30 - 120	1 - 4				4	0 - 200	0 - 5
woolly sedge	CAPE42	4	50 - 100	1 - 2	4	30 - 90	1 - 3				4	0 - 80	0 - 2
other grass-like	2GL	4	50 - 100	1 - 2	4	30 - 120	1 - 4	4	0 - 115	0 - 5	4	0 - 80	0 - 2
<b>NON-NATIVE GRASSES</b>		5			5	300 - 750	10 - 25	5	460 - 920	20 - 40	5	600 - 1200	15 - 30
Kentucky bluegrass	POPR				5	150 - 750	5 - 25	5	230 - 805	10 - 35	5	200 - 1200	5 - 30
smooth brome	BRIN2				5	0 - 450	0 - 15	5	0 - 575	0 - 25	5	0 - 800	0 - 20
cheatgrass	BRTE				5	0 - 150	0 - 5	5	0 - 115	0 - 5	5	0 - 200	0 - 5
<b>FORBS</b>		6	250 - 500	5 - 10	6	150 - 300	5 - 10	6	115 - 460	5 - 20	6	200 - 600	5 - 15
American licorice	GLLE3	6	50 - 100	1 - 2	6	0 - 60	0 - 2				6	40 - 160	1 - 4
American vetch	VIAM	6	0 - 50	0 - 1							6	0 - 40	0 - 1
anemone	ANEMO	6	0 - 50	0 - 1	6	0 - 30	0 - 1						
black medic	MELU	6			6	0 - 60	0 - 2	6	0 - 46	0 - 2	6	0 - 80	0 - 2
Canada goldenrod	SOCA6	6	50 - 100	1 - 2	6	30 - 90	1 - 3	6	23 - 115	1 - 5	6	40 - 200	1 - 5
Canada thistle	CIAR4				6	0 - 150	0 - 5	6	0 - 230	0 - 10	6	0 - 280	0 - 7
catnip	NECA2	6	0 - 50	0 - 1	6	0 - 30	0 - 1				6	0 - 80	0 - 2
cinquefoil	POTEN	6	0 - 50	0 - 1	6	0 - 30	0 - 1	6	0 - 46	0 - 2	6	40 - 80	1 - 2
cocklebur	XANTH2				6	0 - 60	0 - 2	6	0 - 184	0 - 8	6	0 - 80	0 - 2
common dandelion	TAOF				6	30 - 90	1 - 3	6	23 - 92	1 - 4	6	40 - 120	1 - 3
curlycup gumweed	GRSQ				6	0 - 60	0 - 2	6	0 - 69	0 - 3	6	0 - 40	0 - 1
dogbane	APOCY	6	0 - 50	0 - 1	6	30 - 90	1 - 3	6	23 - 92	1 - 4	6	40 - 120	1 - 3
downy gentian	GEPU5				6	0 - 50	0 - 1				6	0 - 40	0 - 1
Flodman's thistle	CIFL	6	0 - 50	0 - 1	6	0 - 60	0 - 2	6	23 - 92	1 - 4	6	40 - 80	1 - 2
heartleaf Alexanders	ZIAP	6	50 - 100	1 - 2							6	0 - 40	0 - 1
Maximilian sunflower	HEMA2	6	50 - 100	1 - 2	6	30 - 60	1 - 2				6	40 - 120	1 - 3
mint	MENTH	6	50 - 100	1 - 2	6	0 - 30	0 - 1				6	40 - 80	1 - 2
northern bedstraw	GABO2	6	0 - 50	0 - 1	6	0 - 30	0 - 1				6	40 - 80	1 - 2
sweetclover	MELIL				6	0 - 150	0 - 5	6	0 - 230	0 - 10	6	0 - 400	0 - 10
western salsify	TRDU				6	0 - 60	0 - 2	6	0 - 69	0 - 3	6	40 - 120	1 - 3
western yarrow	ACMIO	6	50 - 100	1 - 2	6	30 - 60	1 - 2	6	23 - 115	1 - 5	6	40 - 80	1 - 2
white prairie aster	SYFA	6	50 - 100	1 - 2	6	30 - 60	1 - 2	6	23 - 46	1 - 2	6	40 - 120	1 - 3
wood lily	LIPH	6	0 - 50	0 - 1							6	0 - 40	0 - 1
other perennial forbs	2FP	6	0 - 150	0 - 3	6	0 - 150	0 - 5	6	23 - 230	1 - 10	6	40 - 160	1 - 4
other annual forbs	2FA				6	0 - 90	0 - 3	6	23 - 115	1 - 5	6	40 - 160	1 - 4
<b>SHRUBS</b>		7	250 - 500	5 - 10	7	30 - 150	1 - 5	7	23 - 115	1 - 5	7	200 - 600	5 - 15
American plum	PRAM	7	0 - 50	0 - 1	7	0 - 60	0 - 2				7	40 - 240	1 - 6
chokecherry	PRV1	7	50 - 150	1 - 3							7	40 - 120	1 - 3
false indigo	AMFR	7	50 - 100	1 - 2							7	0 - 120	0 - 3
juneberry	AMAL2	7	50 - 150	1 - 3	7	0 - 30	0 - 1				7	0 - 80	0 - 2
Missouri gooseberry	RIMI	7	50 - 100	1 - 2	7	0 - 60	0 - 2	7	0 - 23	0 - 1	7	0 - 160	0 - 4
prairie rose	ROAR3	7	50 - 100	1 - 2	7	30 - 90	1 - 3	7	23 - 69	1 - 3	7	40 - 200	1 - 5
Redosier dogwood	COSE16	7	50 - 100	1 - 2							7	0 - 120	0 - 3
western snowberry	SYOC	7	100 - 250	2 - 5	7	0 - 120	0 - 4	7	0 - 69	0 - 3	7	80 - 400	2 - 10
willow	SALIX	7	100 - 250	2 - 5	7	0 - 60	0 - 2				7	0 - 400	0 - 10
other shrubs	2SHRUB	7	0 - 250	0 - 5	7	0 - 30	0 - 1	7	0 - 23	0 - 1	7	0 - 40	0 - 1
<b>TREES</b>		8	250 - 500	5 - 10	8	0 - 150	0 - 5	8	0 - 92	0 - 4	8	80 - 800	2 - 20
American elm	ULAM	8	0 - 50	0 - 1	8	0 - 30	0 - 1	8	0 - 23	0 - 1	8	0 - 80	0 - 2
boxelder	ACNE2	8	0 - 50	0 - 1	8	0 - 30	0 - 1	8	0 - 23	0 - 1	8	0 - 200	0 - 5
green ash	FRPE	8	50 - 150	1 - 3	8	0 - 90	0 - 3	8	0 - 23	0 - 1	8	80 - 400	2 - 10
peachleaf willow	SAAM2	8	50 - 150	1 - 3	8	0 - 60	0 - 2	8	0 - 23	0 - 1	8	40 - 200	1 - 5
plains cottonwood	PODEM	8	0 - 150	0 - 3	8	0 - 90	0 - 3	8	0 - 23	0 - 1	8	40 - 400	1 - 10
other trees	2TREE	8	0 - 150	0 - 3	8	0 - 90	0 - 3	8	0 - 92	0 - 4	8	0 - 200	0 - 5
<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>			3340 - 3875 - 4350		2030 - 2610 - 3165		1470 - 1898 - 2285		2535 - 2760 - 3050				
<b>FORBS</b>			220 - 375 - 550		145 - 225 - 325		110 - 288 - 500		195 - 400 - 650				
<b>SHRUBS</b>			220 - 375 - 550		25 - 90 - 155		20 - 69 - 120		195 - 400 - 650				
<b>TREES</b>			220 - 375 - 550		0 - 75 - 155		0 - 46 - 95		75 - 440 - 850				
<b>TOTAL</b>			4000 - 5000 - 6000		2200 - 3000 - 3800		1600 - 2300 - 3000		3000 - 4000 - 5200				

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/Switchgrass Plant Community

This is the interpretive plant community and is considered to be the HCPC. This plant community evolved with grazing by large herbivores and is well suited for grazing by domestic livestock and can be found on areas that are grazed and where the grazed plants receive adequate periods of rest during the growing season in order to recover. Historically, fires occurred infrequently but were a very important natural effect on this site. The potential vegetation is about 70 percent grasses and grass-likes, 10 percent forbs, 10 percent shrubs, and 10 percent trees of the total air-dry weight.

Tall warm season grasses dominate this community. The major grasses include big bluestem, switchgrass, Indiangrass, prairie cordgrass, and little bluestem. Other grasses and grass-likes occurring on the community include western wheatgrass, green needlegrass, northern reedgrass, Canada wildrye, sedges, and rush species. Key forbs include American licorice, sunflower, aster, goldenrod, and mint. Shrubs and tree species that recover quickly after fire events are Juneberry, western snowberry, willows, boxelder, hawthorn, chokecherry, and cottonwood.

This plant community is diverse, stable, productive, and is well adapted to the Northern Great Plains. The high water table supplies much of the moisture for plant growth. 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 a high tolerance to a fluctuating water table. 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:

- Continuous grazing without adequate recovery periods between grazing events will shift this plant community to the *Kentucky Bluegrass/Spikerush/Rush Plant Community*.
- Non-use and no fire will move this plant community to the *Kentucky Bluegrass/Western Snowberry, Excessive Litter Plant Community*.
- Cropped go-back land with continuous grazing will convert this plant community to the *Annual/Pioneer Perennial Plant Community*.

### Kentucky Bluegrass/Spikerush/Rush 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 actions before a significant ecological threshold is crossed.

Kentucky bluegrass and western wheatgrass are the dominant species. Big bluestem, green needlegrass, switchgrass, and Indiangrass are greatly reduced. Forb species would include asters, goldenrod, cudweed sagewort, heath aster, wavyleaf thistle, and western yarrow. Invasive forbs are sweetclover, dandelion, and possibly Canada thistle. Shrub and tree regeneration have completely disappeared leaving little to no shrub understory beneath scattered large trees, when present.

Plant diversity and production have been reduced. The soil remains stable. Water cycle, nutrient cycle, and energy flow is slightly reduced but continues to adequately function. Water table tends to rise closer to the surface, which favors an increase of Baltic rush and common spikerush.

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:

- Heavy continuous grazing without adequate recovery periods between grazing events will move this plant community across an ecological threshold to the *Kentucky Bluegrass Sod/Baltic Rush/Forbs Plant Community*.
- Prescribed grazing will move this plant community toward the *Big Bluestem/Switchgrass Plant Community (HCPC)*.
- Cropped go-back land with continuous grazing will convert this plant community to the *Annual/Pioneer Perennial Plant Community*.

### Kentucky Bluegrass/Western Snowberry, Excessive Litter 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 flourishes in this environment and may dominate this plant community. Common forbs include Canada goldenrod, American licorice, cudweed sagewort, and dogbane. Invading forbs are Canada thistle, sweet clover, and dandelion. Shrubs such as western snowberry, willow, Juneberry, rose, and chokecherry will increase in density and cover. Trees species such as green ash, boxelder, cottonwood, peachleaf willow, and others may produce a dense canopy cover in some areas, shading out the grass understory.

This plant community is resistant to change without prescribed grazing and 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.

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:

- Periodic prescribed burning along with prescribed grazing will move this plant community toward the *Big Bluestem/Switchgrass Plant Community (HCPC)*. This would require long-term management with both prescribed grazing and prescribed burning under controlled conditions.
- Cropped go-back land with continuous grazing will convert this plant community to the *Annual/Pioneer Perennial Plant Community*.

### **Kentucky Bluegrass Sod/Baltic Rush/Forbs Plant Community**

This plant community developed with heavy continuous grazing without adequate recovery periods between grazing events. Kentucky bluegrass and Baltic rush, along with fowl bluegrass and common spikerush dominate the community. Kentucky bluegrass can develop into a thick sod. Prairie cordgrass, little bluestem, Indiangrass, green needlegrass, northern reedgrass, and porcupine grass have been removed. Big bluestem, switchgrass, and western wheatgrass may persist in trace amounts, greatly reduced in vigor, and in some instances, not readily seen. Western yarrow, dandelion, and goldenrod have increased. Key shrubs have been severely reduced in vigor or removed completely. A few scattered old decadent trees may remain.

This plant community is resistant to change due to grazing tolerance of Kentucky bluegrass. Production and diversity is significantly reduced when compared to the HCPC. Loss or reduction of cool-season grasses, tall warm-season grasses, and shrub component 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 Kentucky bluegrass. The water table has risen closer to the surface that greatly favors the rush species. 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: 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 with adequate recovery periods following each grazing event and proper stocking over long periods of time will move this plant community toward the *Kentucky Bluegrass/Spikerush/Rush Plant Community*. It may eventually return to the *HCPC* through associated successional plant community stages assuming an adequate seed/vegetative source is available. This process may take greater than 20 years.
- Cropped go-back land with continuous grazing will convert 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 and grass-like may include Baltic rush, common spikerush, sedges, Kentucky bluegrass, smooth bromegrass, prairie Junegrass, and western wheatgrass. The dominant forbs include curlycup gumweed, maretail, salsify, kochia, field bindweed, kochia, thistles, cudweed sagewort, western ragweed, pussytoes, prostrate verbena, and other early successional species. Shrubs that may be present include dogwood and willow. Plant species from adjacent ecological sites may become minor components of this plant community. The community also is susceptible to invasion of other non-native species such as Canada thistle, due to severe soil disturbances and increased bare ground. Many other annual and perennial forbs, including non-native species, may invade the site.

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 in this vegetation state. 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 2,000 lbs./ac. (air-dry weight) depending upon vegetative conditions.

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

- Under long-term prescribed grazing, including adequate rest periods, this plant community will move through the successional stages, and may eventually lead to the *Big Bluestem/Switchgrass 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/Switchgrass Plant Community (HCPC)*.
- Heavy, continuous grazing will lead this plant community towards the *Kentucky Bluegrass Sod/Baltic Rush/Forbs Plant Community*.

## **Ecological Site Interpretations**

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

-- Under Development --

**Big Bluestem/Switchgrass Plant Community:**

**Kentucky Bluegrass/Spikerush/Rush Plant Community:**

**Kentucky Bluegrass Sod/Baltic Rush/Forbs Plant Community:**

**Kentucky Bluegrass/Western Snowberry, Excessive Litter Plant Community:**

**Annual/Pioneer Perennial Plant Community:**

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

Common Name	Cattle	Sheep	Horses	Deer	Antelope	Bison	Elk
<b>Grasses &amp; Grass-likes</b>							
Baltic rush	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
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
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
common spikerush	N U D U	N U U N	N U D U	N U U N	N U U N	N U D U	N U D 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 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
northern reedgrass	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
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 cordgrass	U D D U	N N N N	U D D U	N N N N	N N N N	U D D U	U D D 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
woolly 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
<b>Forbs</b>							
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
anemone	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
Canada goldenrod	N N U N	N U U N	N N U N	N U U N	N U U N	N N U N	N N U N
catnip	N U U N	N U D U	N U U N	N U D U	N U D U	N U U N	N U U N
cinquefoil	U U D U	U U U U	U U D U	U U U U	U U U U	U U D U	U U U U
dogbane	T T T T	T T T T	T T T T	T T T T	T T T T	T T T T	T T T T
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
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
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
Maximilian sunflower	U D P U	U D P U	U D P U	U D P U	U D P U	U D P U	U D P U
mint	N N U N	N U U N	N N U N	N U U N	N U U N	N N U N	N N U N
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
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
white prairie aster	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
wood lily	N U U N	N U D U	N U U N	N U D U	N U D U	N U U N	N U U N
<b>Shrubs</b>							
American plum	D U U D	D U U D	D U U D	P U D D	D U U D	D U U D	D U U D
chokecherry	D T T D	D T T D	D T T D	P U D P	D U U D	D T T D	P U U P
false indigo	N U U N	N U U N	N U U N	N U U N	N U U N	N U U N	N U U N
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
Missouri gooseberry	N N U N	N U U U	N N U N	N U U U	N U U U	N N U N	N U U 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
Redosier dogwood	N U U N	N U D U	N U U N	N U D U	N U D U	N U U N	N U 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
willow	P U D P	P U D P	P U D P	P U D P	U U U U	P U D P	P U D P
<b>Trees</b>							
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
peachleaf willow	N D D U	N D P U	N D D U	N D P U	N D D U	N D D U	N D P U
plains cottonwood	D U U D	D U U D	D U U D	D U D D	D U U D	D U U D	D U U D

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

† Quarters: 1 – Jan., Feb., Mar.; 2 – Apr., May, Jun.; 3 – Jul., Aug., Sep.; 4 – Oct., Nov., Dec.

## Animal Community – Grazing Interpretations

### Hydrology Functions

Water is not a principal factor limiting herbage production on this site. The site is dominated by soils in hydrologic groups C and D, with localized areas in groups A and B. Infiltration varies from slow to moderate, and runoff potential varies from negligible to medium 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 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

This site has potential for wood products from trees and shrubs.

### Other Products

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

## Supporting Information

### Associated Sites

(053BY005ND) – Loamy Overflow  
(053BY006ND) – Saline Lowland

(053BY018ND) – Wet Land  
(053BY019ND) – Wet Meadow

### Similar Sites

(053BY005ND) – Loamy Overflow (LOv)

[Moderately well drained soils in intermittent drainage ways, swales and areas that frequently receive additional moisture throughout the growing season, with no apparent water table. Indicator species: big bluestem with western wheatgrass and green needlegrass, American licorice, and western snowberry. The site has no switchgrass or prairie cordgrass, less big bluestem, more green needlegrass and western wheatgrass; less production, no water table.]

### 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