

United States Department of Agriculture Natural Resources Conservation Service

Ecological Site Description

Site Name: Wet Meadow

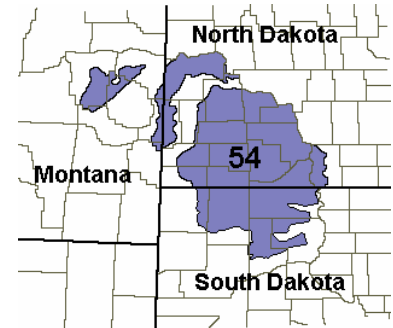
Site Type: Rangeland

Site ID: R054XY037ND

Major Land Resource Area: 54 – Rolling Soft Shale Plain

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

http://www.essc.psu.edu/soil_info/soil_lrr/



Physiographic Features

This site occurs on level to gently sloping sedimentary uplands and floodplains.

Landform: depression, flood plain

Aspect: NA

	<u>Minimum</u>	<u>Maximum</u>
Elevation (feet):	1600	3600
Slope (percent):	0	2
Water Table Depth (inches):	0	>72
Flooding:		
Frequency:	None	Frequent
Duration:	None	Long
Ponding:		
Depth (inches):	0	6
Frequency:	Occasional	Frequent
Duration:	Long	Very long
Runoff Class:	Negligible	Medium

Climatic Features

MLRA 54 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 14 to 18 inches per year. The normal average annual temperature is about 42° F. January is the coldest month with average temperatures ranging from about 13° F (Beach, ND) to about 16° F (Bison, SD). July is the warmest month with temperatures averaging from about 69° F (Beach, ND) to about 72° F (Timber Lake, SD). The range of normal average monthly temperatures between the coldest and warmest months is about 57° F. This large annual range attests to the continental nature of this MLRA's climate. Hourly winds are estimated to 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):	119	136
Freeze-free period (days):	139	157
Mean Annual Precipitation (inches):	14	18

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

	Precip. Min.	Precip. Max	Temp. Min.	Temp. Max.
January	0.41	0.54	2.2	23.8
February	0.37	0.61	8.7	30.4
March	0.51	1.07	17.1	40.0
April	1.13	1.88	28.9	56.8
May	1.98	2.83	40.5	69.3
June	2.83	3.29	49.8	78.3
July	2.05	2.25	54.6	85.2
August	1.49	2.07	53.0	84.3
September	1.29	1.45	42.0	73.4
October	0.89	1.35	31.6	60.4
November	0.48	0.61	19.0	41.5
December	0.42	0.55	8.1	29.0

Climate Stations		Period	
Station ID	Location or Name	From	To
ND0590	Beach	1949	1999
MT7560	Sidney	1949	1999
SD8307	Timber Lake	1948	1999
ND2183	Dickinson FAA AP	1948	1999

For local climate stations that may be more representative, refer to <http://www.wcc.nrcs.usda.gov>.

Influencing Water Features

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

Stream Type: None

Representative Soil Features

The common features of soils in this site are the silt loam to silty clay-textured subsoil and slopes of 0 to 2 percent. The soils in this site are poorly drained and formed in alluvium. The silt loam to silty clay surface layer is 5 to 15 inches thick. The soils have a slow to very slow infiltration rate. This site should show no evidence of rills, wind scoured areas or pedestalled plants. The soil surface is stable and intact. Sub-surface soil layers are non-restrictive to water movement and root penetration.

These soils are not susceptible to water erosion. Pondered water conditions and slow permeability strongly influences the soil-water-plant relationship. Loss of the soil surface layer can result in a shift in species composition and/or production.

Major soil series correlated to this ecological site can be found in Section II of the Natural Resources Conservation Service Field Office Technical Guide or the following web sites:

North Dakota <http://www.nd.nrcs.usda.gov/>
South Dakota <http://www.sd.nrcs.usda.gov/>
Montana <http://www.mt.nrcs.usda.gov/>

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

	<u>Minimum</u>	<u>Maximum</u>
Drainage Class:	poorly	poorly
Permeability Class:	slow	moderate
Depth to first restrictive layer (inches):	>72	>72
Electrical Conductivity (mmhos/cm)*:	0	4
Sodium Absorption Ratio*:	0	5
Soil Reaction (1:1 Water)*:	6.1	8.4
Soil Reaction (0.1M CaCl₂)*:	NA	NA
Available Water Capacity (inches)*:	5	8
Calcium Carbonate Equivalent (percent)*:	0	15

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

Plant Communities

Ecological Dynamics of the Site:

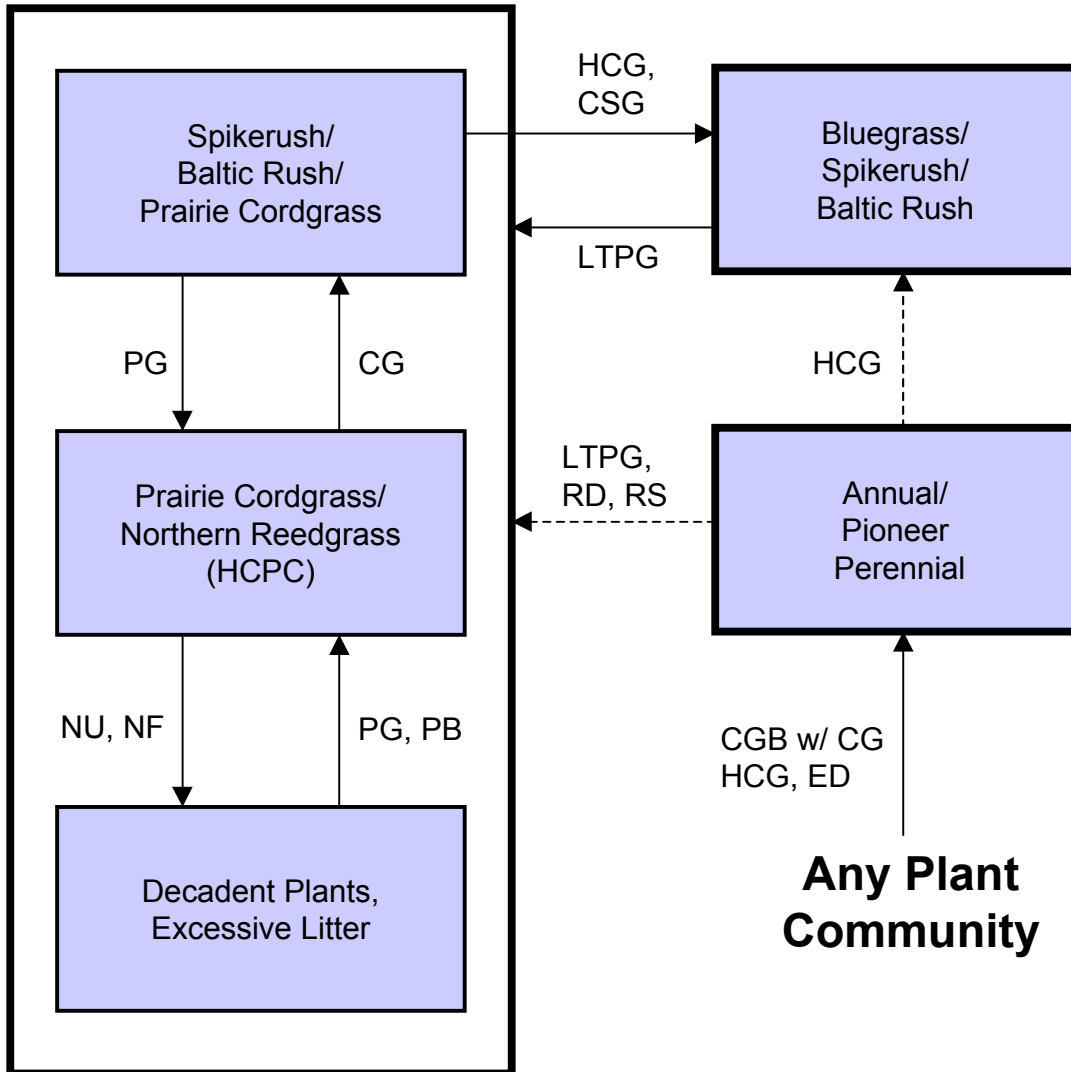
The site developed under Northern Great Plains climatic conditions, and included natural influence of large herbivores and occasional fire. Changes will occur in the plant communities due to climatic conditions and/or management actions. Due to the nature of the soils, the site is considered quite stable. 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 Historic Climax Plant Community. 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 used. Subclimax plant communities, states, transitional pathways, and thresholds have been determined through similar studies and experience.

Ecological changes occur on this site primarily because of continuous grazing without adequate recovery opportunities between grazing events, and over rest or non-use and lack of fire. Continuous grazing will cause species such as spikerush, Baltic rush and native bluegrass to increase. Introduced species such as Kentucky bluegrass will begin to invade and dominate. Grasses such as prairie cordgrass and northern reedgrass will decrease in frequency and production and can eventually be removed from the site. Non-use (extended rest over years) or lack of fire will cause litter levels and plant decadence/mortality to 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



CG - continuous grazing without adequate recovery periods; **CGB w/ CG** - cropped go-back with continuous grazing; **CSG** - continuous seasonal grazing; **ED** - excessive defoliation; **HCG** - heavy continuous grazing; **HCPC** - Historic Climax Plant Community; **LTPG** - long-term prescribed grazing (>10 years); **NU, NF** - non-use, no fire; **PB** - prescribed burning; **PG** - prescribed grazing with adequate recovery opportunity; **RD** - removal of disturbance; **RS** - range seeding with prescribed grazing.

Plant Community Composition and Group Annual Production

		Prairie Cordgrass/Northern Reedgrass (HCPC)			
COMMON/GROUP NAME	SYMBOL	Group	lbs./acre	% Comp	
GRASSES		1	2025 - 2475	45 - 55	
prairie cordgrass	SPPE	1	900 - 1350	20 - 30	
northern reedgrass	CASTI3	1	450 - 675	10 - 15	
American mannagrass	GLGR	1	225 - 450	5 - 10	
American sloughgrass	BESY	1	225 - 450	5 - 10	
switchgrass	PAVI2	1	135 - 225	3 - 5	
western wheatgrass	PASM	1	90 - 225	2 - 5	
fowl bluegrass	POPA2	1	45 - 90	1 - 2	
mat muhly	MURI	1	45 - 90	1 - 2	
tufted hairgrass	DECA18	1	45 - 90	1 - 2	
ticklegrass	AGSC5	1	45 - 90	1 - 2	
other perennial grasses	2GP	1	0 - 90	0 - 2	
GRASS-LIKES		2	900 - 1800	20 - 40	
Baltic rush	JUBA	2	45 - 90	1 - 2	
clustered field sedge	CAPR5	2	225 - 360	5 - 8	
fescue sedge	CABR10	2	225 - 450	5 - 10	
flatsedge	CYPER	2	45 - 90	1 - 2	
Sartwell's sedge	CASA8	2	225 - 450	5 - 10	
spikerush	ELEOC	2	135 - 225	3 - 5	
woolly sedge	CAPE42	2	180 - 360	4 - 8	
other grass-likes	2GL	2	45 - 225	1 - 5	
FORBS		3	135 - 225	3 - 5	
blue-eyed grass	SISYR	3	0 - 45	0 - 1	
Canada goldenrod	SOCA6	3	45 - 90	1 - 2	
cinquefoil	POTEN	3	0 - 45	0 - 1	
dogbane	APOCY	3	45 - 90	1 - 2	
Flodman's thistle	CIFL	3	0 - 45	0 - 1	
Maximilian sunflower	HEMA2	3	45 - 90	1 - 2	
mint	MENTH	3	45 - 90	1 - 2	
prairie gentian	EUEXR	3	0 - 45	0 - 1	
Rydberg's sunflower	HENUR	3	45 - 90	1 - 2	
western dock	RUAQ	3	0 - 45	0 - 1	
other perennial forbs	2FP	3	0 - 45	0 - 1	
Annual Production lbs./acre			LOW	RV	HIGH
GRASSES			2770 -	2970 -	3170
GRASS-LIKES			1100 -	1350 -	1600
FORBS			130 -	180 -	230
TOTAL			4000 -	4500 -	5000

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	Prairie Cordgrass/Northern Reedgrass (HCPC)			Spikerush/Baltic Rush/ Prairie Cordgrass			Decadent Plants, Excessive Litter			Bluegrass/Spikerush/ Baltic Rush		
		Grp	lbs./acre	% Comp	Grp	lbs./acre	% Comp	Grp	lbs./acre	% Comp	Grp	lbs./acre	% Comp
GRASSES													
prairie cordgrass	SPPE	1	900 - 1350	20 - 30	1	350 - 525	10 - 15	1	175 - 350	5 - 10	1	1000 - 1250	40 - 50
northern reedgrass	CASTI3	1	450 - 675	10 - 15	1	0 - 70	0 - 2	1	35 - 175	1 - 5			
American mannagrass	GLGR	1	225 - 450	5 - 10	1	0 - 105	0 - 3	1	35 - 175	1 - 5	1	0 - 25	0 - 1
American sloughgrass	BESY	1	225 - 450	5 - 10	1	175 - 350	5 - 10	1	0 - 70	0 - 2	1	250 - 375	10 - 15
switchgrass	PAVI2	1	135 - 225	3 - 5	1	70 - 105	2 - 3	1	175 - 350	5 - 10	1	0 - 25	0 - 1
western wheatgrass	PASM	1	90 - 225	2 - 5	1	105 - 245	3 - 7	1	175 - 350	5 - 10	1	50 - 125	2 - 5
fowl bluegrass	POPA2	1	45 - 90	1 - 2	1	175 - 350	5 - 10	1	175 - 350	5 - 10	1	250 - 375	10 - 15
mat muhly	MURI	1	45 - 90	1 - 2	1	105 - 175	3 - 5	1	0 - 70	0 - 2	1	125 - 250	5 - 10
tufted hairgrass	DECA18	1	45 - 90	1 - 2	1	105 - 175	3 - 5	1	0 - 70	0 - 2	1	75 - 125	3 - 5
ticklegass	AGSC5	1	45 - 90	1 - 2	1	105 - 175	3 - 5	1	70 - 105	2 - 3	1	125 - 250	5 - 10
foxtail barley	HOJU				1	70 - 175	2 - 5	1	35 - 70	1 - 2	1	125 - 250	5 - 10
quackgrass	ELRE4				1	0 - 350	0 - 10	1	0 - 1050	0 - 30	1	0 - 875	0 - 35
bluegrass	POA				1	175 - 350	5 - 10	1	175 - 350	5 - 10	1	375 - 500	15 - 20
creeping meadow foxtail	ALAR				1	0 - 350	0 - 10	1	0 - 1050	0 - 30	1	0 - 875	0 - 35
other annual grasses	2GA				1	35 - 175	1 - 5	1	70 - 175	2 - 5	1	125 - 250	5 - 10
other perennial grasses	2GP	1	0 - 90	0 - 2	1	35 - 70	1 - 2	1	35 - 175	1 - 5	1	0 - 50	0 - 2
GRASS-LIKES													
Baltic rush	JUBA	2	45 - 90	1 - 2	2	175 - 350	5 - 10	2	35 - 175	1 - 5	2	375 - 500	15 - 20
clustered field sedge	CAPR5	2	225 - 360	5 - 8	2	175 - 350	5 - 10	2	175 - 350	5 - 10	2	125 - 250	5 - 10
fescue sedge	CABR10	2	225 - 450	5 - 10	2	350 - 525	10 - 15	2	35 - 175	1 - 5	2	250 - 375	10 - 15
flatsedge	CYPER	2	45 - 90	1 - 2	2	175 - 350	5 - 10	2	105 - 175	3 - 5	2	125 - 250	5 - 10
Sartwell's sedge	CASA8	2	225 - 450	5 - 10	2	35 - 175	1 - 5	2	175 - 350	5 - 10	2	25 - 50	1 - 2
spikerush	ELEOC	2	135 - 225	3 - 5	2	350 - 700	10 - 20	2	175 - 350	5 - 10	2	250 - 625	10 - 25
woolly sedge	CAPE42	2	180 - 360	4 - 8	2	70 - 175	2 - 5	2	175 - 350	5 - 10	2	25 - 50	1 - 2
other grass-likes	2GL	2	45 - 225	1 - 5	2	35 - 175	1 - 5	2	35 - 175	1 - 5	2	25 - 50	1 - 2
FORBS													
blue-eyed grass	SISYR	3	0 - 45	0 - 1	3	105 - 175	3 - 5	3	0 - 70	0 - 2	3	100 - 150	4 - 6
Canada goldenrod	SOCA6	3	45 - 90	1 - 2	3	105 - 175	3 - 5	3	35 - 70	1 - 2	3	125 - 250	5 - 10
cinquefoil	POTEN	3	0 - 45	0 - 1	3	105 - 175	3 - 5	3	35 - 70	1 - 2	3	125 - 200	5 - 8
common dandelion	TAOF				3	105 - 175	3 - 5	3	0 - 70	0 - 2	3	75 - 100	3 - 4
curly dock	RUCR				3	105 - 175	3 - 5	3	70 - 105	2 - 3	3	125 - 250	5 - 10
dogbane	APOCY	3	45 - 90	1 - 2	3	105 - 175	3 - 5	3	0 - 70	0 - 2	3	75 - 125	3 - 5
Flodman's thistle	CIFL	3	0 - 45	0 - 1	3	70 - 105	2 - 3	3	35 - 70	1 - 2	3	50 - 75	2 - 3
Maximilian sunflower	HEMA2	3	45 - 90	1 - 2				3	35 - 70	1 - 2			
mint	MENTH	3	45 - 90	1 - 2	3	0 - 35	0 - 1	3	70 - 105	2 - 3	3	0 - 25	0 - 1
prairie gentian	EUEXR	3	0 - 45	0 - 1				3	35 - 70	1 - 2			
Rydberg's sunflower	HENUR	3	45 - 90	1 - 2				3	35 - 70	1 - 2			
western dock	RUAQ	3	0 - 45	0 - 1	3	35 - 70	1 - 2	3	35 - 70	1 - 2	3	0 - 25	0 - 1
other annual forbs	2FA				3	35 - 70	1 - 2	3	35 - 70	1 - 2	3	50 - 75	2 - 3
other perennial forbs	2FP	3	0 - 45	0 - 1	3	35 - 70	1 - 2	3	35 - 70	1 - 2	3	50 - 75	2 - 3
Annual Production lbs./acre			LOW RV HIGH		LOW RV HIGH		LOW RV HIGH		LOW RV HIGH		LOW RV HIGH		LOW RV HIGH
GRASSES			2770 - 2970 - 3170		1605 - 1838 - 2050		2300 - 2485 - 2620		1155 - 1438 - 1725				
GRASS-LIKES			1100 - 1350 - 1600		1225 - 1400 - 1575		600 - 875 - 1200		625 - 750 - 875				
FORBS			130 - 180 - 230		170 - 263 - 375		100 - 140 - 180		220 - 313 - 400				
TOTAL			4000 - 4500 - 5000		3000 - 3500 - 4000		3000 - 3500 - 4000		2000 - 2500 - 3000				

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

Plant Community and Vegetation State Narratives

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

Prairie Cordgrass/Northern Reedgrass Plant Community

This is the interpretive plant community and is considered to be the Historic Climax Plant Community (HCPC). This plant community evolved with grazing by large herbivores and is well suited for grazing by domestic livestock. It can be found on grazed areas, where grazed plants receive adequate periods of rest during the growing season in order to recover. Historically, fires occurred infrequently.

The potential vegetation is about 55% grasses, 40% grass-likes, and 5% forbs by air-dry weight. Prairie cordgrass is the dominant tall warm-season grass occupying this plant community. Northern reedgrass is the dominant tall cool season species. A variety of sedges and rushes occur throughout this community as well as switchgrass and fowl bluegrass. Key forbs include Maximillian sunflower, Canada goldenrod and cinquefoil.

This plant community is diverse, stable, and 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 off-site and natural plant mortality is very low. The diversity in plant species allows for the variability of both the fluctuations of water table and reoccurring flooding. This is a sustainable plant community in terms of soil stability, watershed function and biologic integrity.

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

Growth curve number: ND5410

Growth curve name: Missouri Slope, Lowland, Cool, Warm-Season Mix.

Growth curve description: Lowland, warm-season, cool-season co-dominant.

JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
0	0	0	3	22	30	30	8	5	2	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 *Spikerush/Baltic Rush/Prairie Cordgrass Plant Community*.
- Non-use and no fire will move this plant community to the *Decadent Plants, Excessive Litter Plant Community*.
- Excessive defoliation (i.e., areas of heavy animal concentration.) will convert the plant community to the *Annual/Pioneer Perennial Plant Community*.
- Cropped go-back land with continuous grazing will convert this plant community to the *Annual/Pioneer Perennial Plant Community*.

Spikerush/Baltic Rush/Prairie Cordgrass Plant Community

This plant community will slowly develop from the adverse effects of 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.

Prairie cordgrass has been reduced in this plant community, but still persists in fair amounts. Kentucky bluegrass and western wheatgrass are the dominant species. Spikerush and Baltic rush as well as other grass-likes have increased. Northern reedgrass has been significantly reduced. Switchgrass may be removed at this stage. Creeping meadow foxtail can typically invade along drainageways if an upstream seed source is present. Forb species would include asters, goldenrod and cinquefoil as well as a possible invasion of Canada thistle. Plant production and frequency have been reduced. The water cycle, nutrient cycle and energy flow are slightly reduced but continue to adequately function.

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: ND5412

Growth curve name: Missouri Slope, Lowlands, Cool/Warm-season Mix.

Growth curve description: Lowlands, cool-season/tall warm-season dominant.

JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
0	0	0	3	35	35	15	5	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 toward the *Bluegrass/Spikerush/Baltic Rush Plant Community*.
- Prescribed grazing that includes adequate recovery opportunities will shift this plant community back to the *Prairie Cordgrass/Northern Reedgrass Plant Community (HCPC)*.
- Excessive defoliation (i.e., areas of heavy animal concentration,) will convert the plant community to the *Annual/Pioneer Perennial Plant Community*.
- Cropped go-back land with continuous grazing will convert this plant community to the *Annual/Pioneer Perennial Plant Community*.

Decadent Plants, Excessive Litter Plant Community

This plant community develops after an extended period (10 to 20 years or more) of non-use or exclusion of fire. Eventually litter levels become high enough to reduce native grass vigor, diversity and density. Years of accumulated litter will tend to make this community wetter. Baltic rush and bulrush will increase. Hydrophytic forbs will also increase. Bluegrasses such as fowl bluegrass and Kentucky bluegrass as well as creeping meadow foxtail can flourish in this environment and will become a major component of this plant community.

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: ND5406

Growth curve name: Missouri Slope, Introduced Cool-season Grasses.

Growth curve description: Introduced cool-season grasses.

JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
0	0	3	10	35	35	5	2	8	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 *Prairie Cordgrass/Northern Reedgrass Plant Community (HCPC)*. This would require long-term management with prescribed grazing and/or prescribed burning under controlled conditions.
- Excessive defoliation (i.e., areas of heavy animal concentration,) will convert the plant community to the *Annual/Pioneer Perennial Plant Community*.
- Cropped go-back land with continuous grazing will convert this plant community to the *Annual/Pioneer Perennial Plant Community*.

Bluegrass/Spikerush/Baltic Rush Plant Community

This plant community developed with heavy continuous grazing without adequate recovery periods between grazing events. Various bluegrasses, spikerush and Baltic rush dominate the community. Kentucky bluegrass will invade on drier portions of the community. Prairie cordgrass will tend to persist in trace amounts, greatly reduced in vigor. Goldenrod, dogbane and cinquefoil have increased.

A significant amount of production and diversity has been lost when compared to the HCPC. Loss or reduction of native cool and warm season grasses, and the forb component have negatively impacted energy flow and nutrient cycling. It will take an extended period of time to restore this plant community back to the HCPC with improved management. Renovation in most cases would not be practical as well as 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: ND5406

Growth curve name: Missouri Slope, Introduced Cool-season Grasses.

Growth curve description: Introduced cool-season grasses.

JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
0	0	3	10	35	35	5	2	8	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 *Spikerush/Baltic Rush/Prairie Cordgrass Plant Community*. This plant community may eventually return to the *HCPC* or associated successional communities assuming an adequate seed/vegetative source is available. This process may take greater than 20 years.
- Excessive defoliation (i.e., areas of heavy animal concentration,) will convert the plant community to the *Annual/Pioneer Perennial Plant Community*.
- 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 may include inland saltgrass, foxtail barley, barnyardgrass, quackgrass, fowl bluegrass, Kentucky bluegrass, Baltic rush, sedges and western wheatgrass. The dominant forbs include curlycup gumweed, Canada thistle and other early successional species. Plant species from adjacent ecological sites may become minor components of this plant community. The community also is susceptible to invasion of other non-native species due to severe soil disturbances and relatively high percent of bare ground.

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

Significant economic inputs, management and time would be required to move this plant community toward a higher successional stage and a more productive plant community. Secondary succession is highly variable, depending upon availability and diversity of a viable seed bank of higher successional species within the existing plant community and neighboring plant communities. This plant community can be renovated to improve the production capability, but management changes would be needed to maintain the new plant community. The total annual production ranges from 500 to 1500 lbs./ac. (air-dry weight) depending upon growing conditions.

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

- Under long-term prescribed grazing and/or removal of disturbance, including adequate rest periods, this plant community will move through the successional stages, and may eventually lead to a plant community resembling the (HCPC) *Prairie Cordgrass/Northern Reedgrass Plant Community*. 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 (20+ years).
- Range seeding after removal of disturbance with deferment and prescribed grazing can convert this to a plant community resembling the *Prairie Cordgrass/Northern Reedgrass Plant Community*.
- Heavy, continuous grazing after removal of disturbance will direct this plant community towards the *Bluegrass/Spikerush/Baltic Rush Plant Community*.

Ecological Site Interpretations

Animal Community – Wildlife Interpretations

-- Under Development --

Prairie Cordgrass/Northern Reedgrass Plant Community:

Spikerush/Baltic Rush/Prairie Cordgrass Plant Community:

Bluegrass/Spikerush/Baltic Rush Plant Community:

Decadent Plants, 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
rasses & Grass-likes							
American mannagrass	N U U N	N D D U	N U U N	N D D U	N U U N	N U U N	N U U N
American sloughgrass	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
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
bluegrass	U D U U	D P U D	U D U U	U P N D	U P N D	U D U U	U D U U
clustered field sedge	U D U U	U P N D	U D U U	U D U D	U D U D	U D U U	U D U U
creeping meadow foxtail	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
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
flatsedge	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
fowl bluegrass	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
foxtail barley	U D N N	N P N N	U D N N	N P N N	N P N N	U D N N	U D N N
mat muhly	N U U N	U U D U	N U U N	U U U U	U U U U	N U U N	N U U N
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
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
quackgrass	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
Sartwell's 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
spikerush	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
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
ticklegass	U D U U	U D U U	U D U U	U D U U	U D U U	U D U U	U D U U
tufted hairgrass	U D P U	U D P U	U D P U	D D D D	D D D D	U D P U	U D P 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
bs							
blue-eyed grass	U U U U	U U P U	U U U U	U U P U	U U P U	U U U U	U U P U
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
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
common dandelion	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
curly dock	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
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
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
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
prairie gentian	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
Rydberg's 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
western dock	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

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

The following table lists suggested initial stocking rates for cattle under continuous grazing (year long grazing or growing season long grazing) under normal growing conditions; however, *continuous grazing is not recommended*. These are conservative estimates that should be used only as guidelines in the initial stages of the conservation planning process and may need to be adjusted due to diet preferences of other types or kinds of livestock and/or other factors. Often, the current plant composition does not entirely match any particular plant community (as described in this ecological site description). Because of this, a field visit is recommended, in all cases, to document plant composition and production. More precise carrying capacity estimates should eventually be calculated using the following stocking rate information along with animal preference data, particularly when grazers other than cattle are involved. With consultation of the land manager, more intensive grazing management may result in improved harvest efficiencies and increased carrying capacity.

Plant Community	Production (lbs./acre)	Carrying Capacity¹ (AUM/acre)
Prairie Cordgrass/Northern Reedgrass (HCPC)	4500	1.42 ²
Spikerush/Baltic Rush/Prairie Cordgrass	3500	1.10 ²
Decadent Plants, Excessive Litter	3500	1.10 ²
Bluegrass/Spikerush/Baltic Rush	2500	0.79 ²
Annual/Pioneer Perennial	-- ³	-- ³

¹ Continuous season-long grazing by cattle under average growing conditions.

² Stocking rates may need to be adjusted due to palatability and/or availability of forage.

³ Highly variable; stocking rate needs to be determined on site.

Hydrology Functions

Water ponding is the principal factor limiting herbage production on this site. The site is dominated by soils in hydrologic groups B and D. Infiltration varies from moderate to slow and runoff potential for this site is negligible. In many cases, areas with greater than 75% 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% 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 variety of plants which bloom from spring until fall have an esthetic value that appeals to visitors.

Wood Products

No appreciable wood products are present on the site.

Other Products

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

Supporting Information

Associated Sites

(054XY023ND) – Loamy Overflow

(054XY032ND) – Subirrigated

(054XY024ND) – Saline Lowland

(054XY036ND) – Wet Land

Similar Sites

(054XY022ND) – Closed Depression (CD)

[Poorly drained clayey soils with sodic subsoils and with noticeable redoximorphic features within depressions. Ponds periodically with no apparent water table. Indicator species: dominated by western wheatgrass with alkaligrass and foxtail barley intermixed, forb indicator is western dock, no shrubs. This site has less production, far more western wheatgrass and far less prairie cordgrass, no water table, a restrictive sodic layer and evidence of salts are within the soil profile.

(054XY024ND) – Saline Lowland (SL)

[Found adjacent to streams, toe slopes, foot slopes or sideslopes. Most are poorly drained soils, with water table at the surface or within 3 feet from the surface with evidence of salts within soil profile, noticeable redoximorphic features within 6 inches or just below the organic soil layer. Found upslope from wet land or wet meadow and downslope of subirrigated or overflow sites. Can be located within the listed associated sites. Indicator species are Nuttall's alkaligrass intermixed with western wheatgrass, some rushes and sedges. This site has less production, far more western wheatgrass and far less prairie cordgrass, a water table and evidence of salts within the soil profile are present.

(054XY036ND) – Wet Land (WL)

[Very poorly drained soils with noticeable redoximorphic features within 6 inches or just below the organic soil layer, found in depressions and along streams where water ponds at or above the surface for more the 7 days. Found down slope of wet meadow sites and can be in micro low positions within the listed associated sites. Indicator species are slough sedge, whitetop, prairie cordgrass, cattail, smartweed and no shrub. This site has more production, far more slough sedge and far less prairie cordgrass, and no water table is present.

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 specialist.

Those involved in developing this site description include: Dennis Froemke, NRCS Range Management Specialist; Jeff Printz, NRCS State Range Management Specialist; Stan Boltz, NRCS Range Management Specialist; Darrell Vanderbusch, NRCS Resource Soil Scientist; L. Michael Stirling, NRCS Range Management Specialist; Josh Saunders, NRCS Range Management Specialist; Jody Forman, NRCS Grazing Land Management Specialist; David Dewald, NRCS State Biologist; and Brad Podoll, NRCS Biologist.

<u>Data Source</u>	<u>Number of Records</u>	<u>Sample Period</u>	<u>State</u>	<u>County</u>
SCS-RANGE-417	0			
Ocular Estimates	4	1992 – 2001	ND	Dunn, Morton, Stark

State Correlation

This site has been correlated with North Dakota and South Dakota in MLRA 54.

Field Offices

Baker, MT	Buffalo, SD	Faith, SD	Mott, ND
Beach, ND	Carson, ND	Hettinger, ND	Selfridge, ND
Beulah, ND	Culbertson, MT	Killdeer, ND	Sidney, MT
Bison, SD	Dickinson, ND	Mandan, ND	Watford City, ND
Bowman, ND	Dupree, SD	McIntosh, SD	Wibaux, MT

Relationship to Other Established Classifications

Level IV Ecoregions of the Conterminous United States: 43a – Missouri Plateau.

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

State Range Management Specialist

Date

State Range Management Specialist

Date

State Range Management Specialist

Date