

United States Department of Agriculture Natural Resources Conservation Service

Ecological Site Description

Site Type: Rangeland

Site Name: Loamy Overflow

Site ID: R058DY020SD

Major Land Resource Area (MLRA): 58D – Northern Rolling High Plains, Eastern Part



Physiographic Features

This site occurs on concave to nearly level areas adjacent to streams and on gently sloping uplands.

Landform: flood plain, swale, drainageway

Aspect: N/A

	<u>Minimum</u>	<u>Maximum</u>
Elevation (feet):	2,300	4,000
Slope (percent):	0	3
Water Table Depth (inches):	80	80
Flooding:		
Frequency:	Occasional	Frequent
Duration:	Brief	Brief
Ponding:		
Depth (inches):	None	None
Frequency:	None	None
Duration:	None	None
Runoff Class:	Low	Medium

Climatic Features

The climate in this MLRA is typical of the drier portions of the Northern Great Plains where sagebrush steppes to the west yield to grassland to the east. Annual precipitation ranges from 14 to 16 inches. Most of the rainfall occurs as frontal storms early in the growing season. Some high intensity, convective thunderstorms occur in the summer. Precipitation in winter occurs as snow. Temperatures show a wide range between summer and winter and between daily maximums and minimums due to the high elevation and dry air, which permits rapid incoming and outgoing radiation. Outbreaks of cold air from Canada in winter move rapidly from northwest to southeast and account for extreme minimum temperatures. Extreme storms may occur during the winter, but most severely affect ranch operations during late winter and spring. The normal average annual temperature is about 44°F. January is the coldest month with average temperatures ranging from about 12°F (Marmarth, North Dakota (ND)), to about 20°F (Baker, Montana (MT)). July is the warmest month with temperatures averaging from about 70°F (Marmarth, ND), to about 76°F (Baker, MT). The range of normal average monthly temperatures between the coldest and warmest months is about 55°F.

Hourly winds are estimated to average about 11 miles per hour (mph) annually, ranging from about 13 mph during the spring to about 10 mph 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 mph. Growth of cool-season plants begins in early to mid-March, slowing or ceasing in late June. Warm-season plants begin growth about mid-May and can continue to early or mid-September. Greenup of cool-season plants may occur in September and October when adequate soil moisture is present.

	<u>Minimum</u>	<u>Maximum</u>
Frost-free period (days):	110	123
Freeze-free period (days):	130	140
Mean Annual Precipitation (inches):	14	16

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

	Precip. Min.	Precip. Max	Temp. Min.	Temp. Max.
January	0.39	0.46	-0.8	31.0
February	0.34	0.54	5.7	34.4
March	0.73	0.82	15.7	43.8
April	1.23	1.73	29.1	60.4
May	2.29	2.71	39.6	67.7
June	2.79	3.00	49.3	76.7
July	1.91	2.10	54.5	90.7
August	1.35	1.46	50.2	88.2
September	1.16	1.25	40.1	76.5
October	0.85	1.07	28.9	59.5
November	0.43	0.57	15.9	44.6
December	0.31	0.50	6.1	33.7

Climate Stations		Period	
Station ID	Location or Name	From	To
MT0412	Baker	1948	2005
SD1294	Camp Crook	1896	2006
SD3560	Harding 3 SE	1951	2006
ND5575	Marmarth	1950	2006
SD7062	Redig 11 NE	1948	2006

For other 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

The features common to soils in this site are the silt loam and loam textured surface layers and slopes of zero to three percent. The soils in this site are well-drained and formed in fine-loamy alluvium derived from sedimentary rock. The surface layer is 10 to 15 inches thick. The texture of the subsurface layers range from fine sand to silty clay loam. This site should show slight to no evidence of rills, wind scoured areas, or pedestalled plants. Water flow paths are broken, irregular in appearance, or discontinuous. The soil surface is stable and intact. These soils are susceptible to water erosion. The hazard of water erosion increases when vegetation is greatly reduced and bare ground increases. Headcuts can begin resulting in gullies to occur.

Access Web Soil Survey (<http://websoilsurvey.nrcs.usda.gov/app/HomePage.htm>) for specific local soils information.

Parent Material Kind: alluvium
Parent Material Origin: sandstone or siltstone
Surface Texture: silt loam, loam
Surface Texture Modifier: none
Subsurface Texture Group: loamy
Surface Fragments ≤3” (% Cover): 0
Surface Fragments >3” (%Cover): 0-15
Subsurface Fragments ≤3” (% Volume): 0-5
Subsurface Fragments >3” (% Volume): 0

	<u>Minimum</u>	<u>Maximum</u>
Drainage Class:	well	well
Permeability Class:	slow	slow
Depth to Bedrock (inches):	80	80
Electrical Conductivity (mmhos/cm)*:	0	4
Sodium Absorption Ratio*:	0	2
Soil Reaction (1:1 Water)*:	6.1	8.4
Soil Reaction (0.1M CaCl₂)*:	NA	NA
Available Water Capacity (inches)*:	7	7
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

This site developed under Northern Great Plains climatic conditions, natural influences of large herbivores, occasional fire, and other biotic and abiotic factors that typically influence soil/site development. Changes will occur in the plant communities due to short-term weather variations, impacts of native and/or exotic plant and animal species, and management actions. While the following plant community descriptions describe more typical transitions between communities that will occur, severe disturbances, such as periods of well below average precipitation, can cause significant shifts in plant communities and/or species composition.

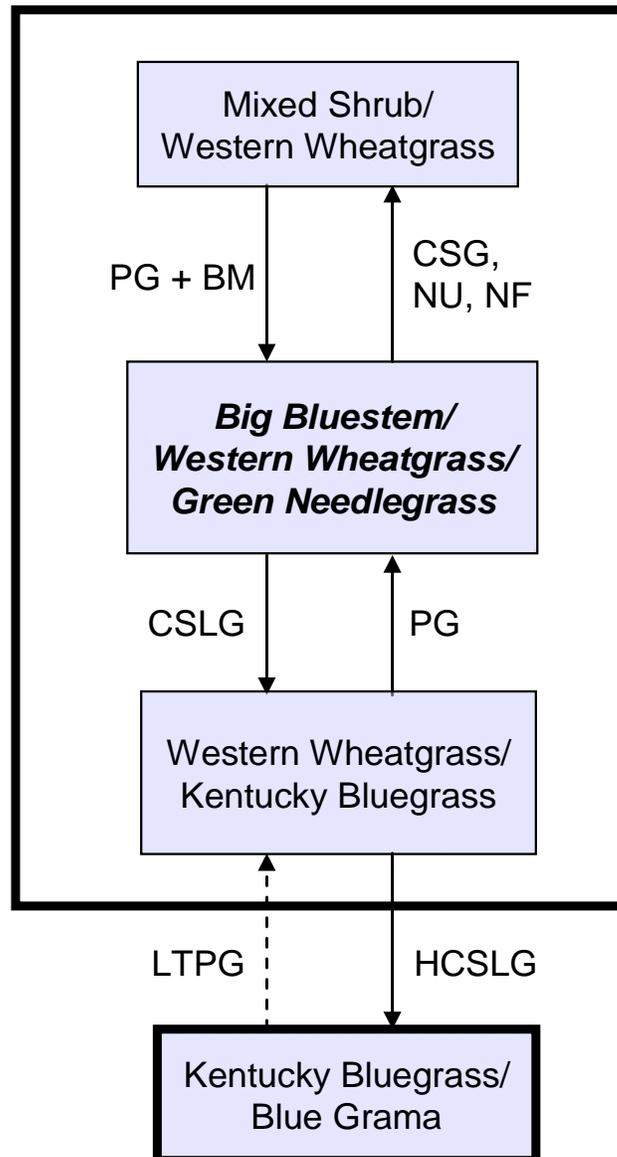
The plant community upon which interpretations are primarily based is the Big Bluestem/Western Wheatgrass/Green Needlegrass Plant Community. This plant community has been determined by studying rangeland relic areas, areas protected from excessive disturbance, and areas under long-term rotational grazing regimes. Trends in plant community dynamics ranging from heavily grazed to lightly grazed areas, seasonal use pastures, and historical accounts also have been used. Plant communities, states, transitional pathways, and thresholds have been determined through similar studies and experience.

Continuous grazing without adequate recovery periods following each grazing occurrence over several years causes this site to depart from the Big Bluestem/Western Wheatgrass/Green Needlegrass Plant Community. Species such as western wheatgrass and blue grama will initially increase. Big bluestem, green needlegrass, and switchgrass will decrease in frequency and production. Heavy continuous grazing causes Kentucky bluegrass to increase and eventually develops into a sod condition. Extended periods of nonuse and no fire will result in a plant community having high litter levels, which favors an increase in Kentucky bluegrass and annual bromes. In time,

shrubs such as western snowberry and chokecherry will also 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 are discussed in more detail in the plant community descriptions following the diagram.

Plant Communities and Transitional Pathways



BM – Brush management (fire, chemical, mechanical); **HCSLG** – Heavy continuous season-long grazing; **LTPG** – Long-term prescribed grazing; **CSG** – Continuous seasonal grazing; **CSLG** – Continuous season-long grazing; **NF** – No fire; **NU** – Non-use; **PG** – Prescribed grazing (proper stocking rates with adequate recovery periods during the growing season).

Plant Community Composition and Group Annual Production

COMMON/GROUP NAME	SCIENTIFIC NAME	SYMBOL	Big Bluestem/Western Wheatgrass/ Green Needlegrass		
			Group	lbs./acre	% Comp
GRASSES & GRASS-LIKES				2100 - 2520	75 - 90
TALL WARM-SEASON GRASSES			1	700 - 980	25 - 35
big bluestem	Andropogon gerardii	ANGE	1	560 - 980	20 - 35
switchgrass	Panicum virgatum	PAVI2	1	28 - 140	1 - 5
prairie sandreed	Calamovilfa longifolia	CALO	1	0 - 140	0 - 5
WHEATGRASSES			2	420 - 840	15 - 30
western wheatgrass	Pascopyrum smithii	PASM	2	420 - 840	15 - 30
slender wheatgrass	Elymus trachycaulus	ELTR7	2	0 - 140	0 - 5
COOL-SEASON BUNCHGRASSES			3	280 - 700	10 - 25
green needlegrass	Nassella viridula	NAVI4	3	280 - 560	10 - 20
needleandthread	Hesperostipa comata ssp. comata	HECOC8	3	140 - 280	5 - 10
Canada wildrye	Elymus canadensis	ELCA4	3	0 - 84	0 - 3
WARM-SEASON BUNCHGRASSES			4	28 - 140	1 - 5
blue grama	Bouteloua gracilis	BOGR2	4	28 - 140	1 - 5
little bluestem	Schizachyrium scoparium	SCSC	4	0 - 140	0 - 5
OTHER NATIVE GRASSES			5	28 - 140	1 - 5
prairie junegrass	Koeleria macrantha	KOMA	5	28 - 84	1 - 3
tall dropseed	Sporobolus compositus var. compositus	SPCOC2	5	0 - 56	0 - 2
other perennial grasses		2GP	5	0 - 140	0 - 5
GRASS-LIKES			6	28 - 140	1 - 5
sedge	Carex spp.	CAREX	6	28 - 140	1 - 5
other grass-likes		2GL	6	0 - 84	0 - 3
FORBS			8	56 - 280	2 - 10
American licorice	Glycyrrhiza lepidota	GLLE3	8	0 - 28	0 - 1
American vetch	Vicia americana	VIAM	8	0 - 28	0 - 1
blue-eyed grass	Sisyrinchium spp.	SISYR	8	0 - 28	0 - 1
cinquefoil	Potentilla spp.	POTEN	8	0 - 28	0 - 1
cudweed sagewort	Artemisia ludoviciana	ARLU	8	28 - 84	1 - 3
goldenrod	Solidago spp.	SOLID	8	28 - 84	1 - 3
Maximilian sunflower	Helianthus maximiliani	HEMA2	8	28 - 84	1 - 3
meadow anemone	Anemone canadensis	ANCA8	8	0 - 28	0 - 1
prairie coneflower	Ratibida columnifera	RACO3	8	0 - 28	0 - 1
purple prairie clover	Dalea purpurea	DAPU5	8	0 - 28	0 - 1
scurfpea	Psoralidium spp.	PSORA2	8	28 - 56	1 - 2
wavyleaf thistle	Cirsium undulatum	CIUN	8	0 - 28	0 - 1
western yarrow	Achillea millefolium var. occidentalis	ACMIO	8	28 - 56	1 - 2
white prairie aster	Symphotrichum falcatum	SYFA	8	28 - 56	1 - 2
native forbs		2FN	8	28 - 140	1 - 5
SHRUBS			9	140 - 336	5 - 12
chokecherry	Prunus virginiana	PRVI	9	0 - 56	0 - 2
currant	Ribes spp.	RIBES	9	0 - 56	0 - 2
juneberry	Amelanchier alnifolia	AMAL2	9	0 - 28	0 - 1
rose	Rosa spp.	ROSA5	9	28 - 84	1 - 3
silver buffaloberry	Shepherdia argentea	SHAR	9	0 - 84	0 - 3
silver sagebrush	Artemisia cana	ARCA13	9	0 - 28	0 - 1
snowberry	Symphoricarpos spp.	SYMPH	9	28 - 140	1 - 5
wild plum	Prunus americana	PRAM	9	28 - 84	1 - 3
other shrubs		2SHRUB	9	0 - 140	0 - 5
TREES			10	0 - 56	0 - 2
American elm	Ulmus americana	ULAM	10	0 - 56	0 - 2
green ash	Fraxinus pennsylvanica	FRPE	10	0 - 56	0 - 2
plains cottonwood	Populus deltoides ssp. monilifera	PODEM	10	0 - 56	0 - 2
other trees		2TREE	10	0 - 56	0 - 2

Annual Production lbs./acre	LOW	RV	HIGH
GRASSES & GRASS-LIKES	1720	2366	3025
FORBS	55	168	320
SHRUBS	125	238	395
TREES	0	28	60
TOTAL	1900	2800	3800

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/Western Wheatgrass/Green Needlegrass			Mixed Shrub/Western Wheatgrass			Western Wheatgrass/Kentucky Bluegrass			Kentucky Bluegrass/Blue Grama		
		Grp	lbs./acre	% Comp	Grp	lbs./acre	% Comp	Grp	lbs./acre	% Comp	Grp	lbs./acre	% Comp
GRASSES & GRASS-LIKES			2100 - 2520	75 - 90		1320 - 1760	60 - 80		1280 - 1440	80 - 90		1020 - 1140	85 - 95
TALL WARM-SEASON GRASSES		1	700 - 980	25 - 35	1	44 - 220	2 - 10	1	32 - 160	2 - 10	1	0 - 60	0 - 5
big bluestem	ANGE	1	560 - 980	20 - 35	1	44 - 220	2 - 10	1	32 - 160	2 - 10	1	0 - 60	0 - 5
switchgrass	PAV12	1	28 - 140	1 - 5	1	0 - 66	0 - 3	1	0 - 48	0 - 3			
prairie sandreed	CALO	1	0 - 140	0 - 5	1	0 - 44	0 - 2	1	0 - 32	0 - 2			
WHEATGRASSES		2	420 - 840	15 - 30	2	330 - 660	15 - 30	2	240 - 480	15 - 30	2	24 - 180	2 - 15
western wheatgrass	PASM	2	420 - 840	15 - 30	2	220 - 550	10 - 25	2	240 - 480	15 - 30	2	24 - 180	2 - 15
slender wheatgrass	ELTR7	2	0 - 140	0 - 5	2	0 - 66	0 - 3	2	0 - 32	0 - 2			
COOL-SEASON BUNCHGRASSES		3	280 - 700	10 - 25	3	44 - 264	2 - 12	3	0 - 80	0 - 5	3		
green needlegrass	NAV14	3	280 - 560	10 - 20	3	22 - 176	1 - 8	3	0 - 80	0 - 5			
needleandthread	HECOC8	3	140 - 280	5 - 10	3	22 - 176	1 - 8	3	0 - 48	0 - 3			
Canada wildrye	ELCA4	3	0 - 84	0 - 3	3	0 - 22	0 - 1						
WARM-SEASON BUNCHGRASSES		4	28 - 140	1 - 5	4	44 - 220	2 - 10	4	80 - 240	5 - 15	4	180 - 300	15 - 25
blue grama	BOGR2	4	28 - 140	1 - 5	4	44 - 220	2 - 10	4	80 - 240	5 - 15	4	180 - 300	15 - 25
little bluestem	SCSC	4	0 - 140	0 - 5	4	0 - 66	0 - 3						
OTHER NATIVE GRASSES		5	28 - 140	1 - 5	5	22 - 110	1 - 5	5	16 - 64	1 - 4	5	0 - 48	0 - 4
prairie junegrass	KOMA	5	28 - 84	1 - 3	5	22 - 66	1 - 3	5	0 - 32	0 - 2	5	0 - 24	0 - 2
tall dropseed	SPCOC2	5	0 - 56	0 - 2	5	0 - 44	0 - 2	5	0 - 16	0 - 1			
other perennial grasses	2GP	5	0 - 140	0 - 5	5	0 - 110	0 - 5	5	0 - 48	0 - 3	5	0 - 36	0 - 3
GRASS-LIKES		6	28 - 140	1 - 5	6	44 - 110	2 - 5	6	32 - 128	2 - 8	6	24 - 120	2 - 10
sedge	CAREX	6	28 - 140	1 - 5	6	44 - 110	2 - 5	6	32 - 128	2 - 8	6	24 - 120	2 - 10
other grass-likes	2GL	6	0 - 84	0 - 3	6	0 - 66	0 - 3	6	0 - 48	0 - 3	6	0 - 36	0 - 3
NON-NATIVE GRASSES		7			7	44 - 220	2 - 10	7	160 - 400	10 - 25	7	300 - 480	25 - 40
bluegrass	POA				7	22 - 220	1 - 10	7	80 - 320	5 - 20	7	240 - 420	20 - 35
cheatgrass	BRTE				7	22 - 220	1 - 10	7	32 - 160	2 - 10	7	24 - 120	2 - 10
FORBS		8	56 - 280	2 - 10	8	110 - 220	5 - 10	8	80 - 160	5 - 10	8	60 - 120	5 - 10
American licorice	GLLE3	8	0 - 28	0 - 1	8	0 - 44	0 - 2	8	0 - 48	0 - 3	8	0 - 24	0 - 2
American vetch	VIAM	8	0 - 28	0 - 1	8	0 - 22	0 - 1						
blue-eyed grass	SISYR	8	0 - 28	0 - 1									
cinquefoil	POTEN	8	0 - 28	0 - 1	8	0 - 22	0 - 1	8	0 - 16	0 - 1			
cudweed sagewort	ARLU	8	28 - 84	1 - 3	8	22 - 66	1 - 3	8	16 - 80	1 - 5	8	12 - 60	1 - 5
goldenrod	SOLID	8	28 - 84	1 - 3	8	22 - 66	1 - 3	8	16 - 64	1 - 4	8	12 - 60	1 - 5
Maximilian sunflower	HEMA2	8	28 - 84	1 - 3	8	0 - 22	0 - 1						
meadow anemone	ANCA8	8	0 - 28	0 - 1									
prairie coneflower	RACO3	8	0 - 28	0 - 1	8	0 - 22	0 - 1	8	0 - 16	0 - 1			
purple prairie clover	DAPU5	8	0 - 28	0 - 1	8	0 - 22	0 - 1	8	0 - 16	0 - 1			
scurfpea	PSORA2	8	28 - 56	1 - 2	8	22 - 66	1 - 3	8	16 - 48	1 - 3	8	0 - 36	0 - 3
wavyleaf thistle	CIUN	8	0 - 28	0 - 1	8	0 - 44	0 - 2	8	0 - 32	0 - 2	8	0 - 12	0 - 1
western yarrow	ACMIO	8	28 - 56	1 - 2	8	22 - 66	1 - 3	8	16 - 48	1 - 3	8	12 - 60	1 - 5
white prairie aster	SYFA	8	28 - 56	1 - 2	8	22 - 66	1 - 3	8	16 - 48	1 - 3	8	12 - 24	1 - 2
native forbs	2FN	8	28 - 140	1 - 5	8	22 - 110	1 - 5	8	16 - 80	1 - 5	8	12 - 60	1 - 5
introduced forbs	2FI				8	0 - 66	0 - 3	8	16 - 80	1 - 5	8	12 - 60	1 - 5
SHRUBS		9	140 - 336	5 - 12	9	110 - 440	5 - 20	9	80 - 160	5 - 10	9	24 - 120	2 - 10
chokecherry	PRVI	9	0 - 56	0 - 2	9	0 - 88	0 - 4	9	0 - 32	0 - 2	9	0 - 12	0 - 1
currant	RIBES	9	0 - 56	0 - 2	9	0 - 66	0 - 3	9	0 - 16	0 - 1			
juneberry	AMAL2	9	0 - 28	0 - 1	9	0 - 44	0 - 2	9	0 - 16	0 - 1			
rose	ROSA5	9	28 - 84	1 - 3	9	22 - 110	1 - 5	9	16 - 48	1 - 3	9	12 - 36	1 - 3
silver buffaloberry	SHAR	9	0 - 84	0 - 3	9	0 - 110	0 - 5	9	0 - 32	0 - 2	9	0 - 24	0 - 2
silver sagebrush	ARCA13	9	0 - 28	0 - 1	9	0 - 66	0 - 3	9	0 - 16	0 - 1			
snowberry	SYMPH	9	28 - 140	1 - 5	9	44 - 220	2 - 10	9	16 - 80	1 - 5	9	12 - 60	1 - 5
wild plum	PRAM	9	28 - 84	1 - 3	9	22 - 176	1 - 8	9	16 - 80	1 - 5	9	12 - 60	1 - 5
other shrubs	2SHRUB	9	0 - 140	0 - 5	9	0 - 110	0 - 5	9	0 - 48	0 - 3	9	0 - 24	0 - 2
TREES		10	0 - 56	0 - 2	10	0 - 44	0 - 2	10	0 - 32	0 - 2	10	0 - 24	0 - 2
American elm	ULAM	10	0 - 56	0 - 2	10	0 - 44	0 - 2	10	0 - 32	0 - 2	10	0 - 24	0 - 2
green ash	FRPE	10	0 - 56	0 - 2	10	0 - 44	0 - 2	10	0 - 32	0 - 2	10	0 - 24	0 - 2
plains cottonwood	PODEM	10	0 - 56	0 - 2	10	0 - 44	0 - 2	10	0 - 32	0 - 2	10	0 - 24	0 - 2
other trees	2TREE	10	0 - 56	0 - 2	10	0 - 44	0 - 2	10	0 - 32	0 - 2	10	0 - 24	0 - 2
Annual Production lbs./acre			LOW RV HIGH		LOW RV HIGH		LOW RV HIGH		LOW RV HIGH		LOW RV HIGH		LOW RV HIGH
GRASSES & GRASS-LIKES			1720 - 2366 - 3025		1000 - 1738 - 2380		850 - 1344 - 1805		725 - 1026 - 1515				
FORBS			55 - 168 - 320		100 - 165 - 250		75 - 120 - 180		55 - 90 - 130				
SHRUBS			125 - 238 - 395		100 - 275 - 525		75 - 120 - 180		20 - 72 - 130				
TREES			0 - 28 - 60		0 - 22 - 45		0 - 16 - 35		0 - 12 - 25				
TOTAL			1900 - 2800 - 3800		1200 - 2200 - 3200		1000 - 1600 - 2200		800 - 1200 - 1800				

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 information is collected, some of these plant community descriptions may be revised or removed, and new ones added. None of these plant communities should necessarily be thought of as “Desired Plant Communities (DPC).” According to the United States Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS) National Range and Pasture Handbook, DPCs 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/Western Wheatgrass/Green Needlegrass Plant Community

The interpretive plant community for this site is the Big Bluestem/Western Wheatgrass/Green Needlegrass Plant Community. This is also considered to be climax. This plant community can be found on areas that are properly managed with grazing and/or prescribed burning, and sometimes on areas receiving occasional short periods of deferment.

The potential vegetation is about 75 to 90 percent grasses or grass-like plants, 2 to 10 percent forbs, 5 to 12 percent shrubs, and 0 to 2 percent trees. This plant community is co-dominated by warm- and cool-season grasses. The major grasses include big bluestem, western wheatgrass, and green needlegrass. Other grasses or grass-likes occurring on the site include needleandthread, blue grama, switchgrass, prairie Junegrass, and sedge. Significant forbs include cudweed sagewort, goldenrod, heath aster, and scurfspea. The significant shrubs that occur include rose, snowberry, and wild plum.

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). The diversity in plant species allows for high drought tolerance. This is a healthy and sustainable plant community. Moderate or high available water capacity provides a favorable soil-water-plant relationship. Overall, the interpretive plant community has the appearance of being stable, diverse, and productive. Plant litter is properly distributed with very little movement offsite and natural plant mortality is very low.

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

Growth curve number: SD5803

Growth curve name: Northern Rolling High Plains, cool-season/warm-season codominant.

Growth curve description: Cool-season, warm-season codominant.

JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
0	0	3	10	20	28	21	10	5	3	0	0

Transitions or community pathways leading to other plant communities are as follows:

- Continuous season-long grazing will lead to the *Western Wheatgrass/Kentucky Bluegrass Plant Community*. This occurs with exposure to herbivory during the entire growing season at moderate stocking rates.
- Continuous seasonal grazing with no fire or non-use and no fire will lead this plant community to the *Mixed Shrub/Western Wheatgrass Plant Community*.

Western Wheatgrass/Kentucky Bluegrass Plant Community

This plant community develops under continuous season-long grazing or from over utilization during extended drought periods. The potential vegetation is made up of approximately 80 to 90 percent grasses and grass-like species, 5 to 10 percent forbs, 5 to 10 percent shrubs, and 0 to 2 percent trees. The dominant grasses include western wheatgrass and Kentucky bluegrass. Other grasses or grass-likes may include sedge, blue grama, big bluestem, green needlegrass, cheatgrass, and prairie Junegrass. Significant forbs include cudweed sagewort, goldenrod, scurfpea, western yarrow, and white prairie aster. The dominant shrubs that occur include western snowberry, wild plum, and rose.

Compared to the Big Bluestem/Western Wheatgrass/Green Needlegrass Plant Community, big bluestem and green needlegrass have decreased while the shortgrass species including blue grama and Kentucky bluegrass have increased. Annual bromes, sweetclover, and other annual grasses and forbs can invade the site. This plant community can occur in a mosaic with patchy, slightly used areas occurring adjacent to and intermingled with this plant community.

This plant community is relatively stable and less productive than the Big Bluestem/Western Wheatgrass/Green Needlegrass Plant Community. Reduction of litter and short plant heights result in higher soil temperatures, poor water infiltration rates, and increased runoff. This plant community can occur throughout the site, on spot grazed areas, and around water sources where season-long grazing patterns occur. Soil erosion will be minimal due to the sod forming habit of the bluegrasses.

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

Growth curve number: SD5801

Growth curve name: Northern Rolling High Plains, cool-season dominant.

Growth curve description: Cool-season dominant.

JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
0	0	4	12	25	36	10	5	4	4	0	0

Transitions or community pathways leading to other plant communities are as follows:

- Prescribed grazing, which allows for adequate plant recovery periods will move this plant community to the *Big Bluestem/Western Wheatgrass/Green Needlegrass Plant Community*.
- With heavy continuous season-long grazing this plant community will move towards the *Kentucky Bluegrass/Blue Grama Plant Community*.

Mixed Shrub/Western Wheatgrass Plant Community

This plant community develops after an extended period of nonuse and exclusion of fire. This plant community will also develop with moderate continuous seasonal grazing (grazing the same time of year every year). In either case, shrubs increase and can sometimes dominate the plant community. Cool-season grasses make up the majority of the understory with the balance made up of short warm-season grasses and miscellaneous forbs. Western wheatgrass is the dominant grass. Grasses of secondary importance include green needlegrass, needleandthread, prairie Junegrass, and blue grama. Woody plants such as snowberry, wild plum, rose, chokecherry, and silver buffaloberry increase with canopy cover up to 20 percent or more. Forbs commonly found in this plant community include cudweed sagewort, goldenrod, western yarrow, white prairie aster, and scurfpea.

This plant community is resistant to change without prescribed grazing and/or fire. The combination of both grazing and fire or other means to reduce shrub cover is most effective in moving this plant

community toward the Big Bluestem/Western Wheatgrass/Green Needlegrass Plant Community. Soil erosion is low, but runoff is increased. Once the advanced stage of this plant community is reached, time and external resources will be needed to see recovery in the diversity of the site.

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

Growth curve number: SD5802

Growth curve name: Northern Rolling High Plains, cool-season dominant, warm-season subdominant

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

JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
0	0	3	10	23	34	15	6	5	4	0	0

Transitions or community pathways leading to other plant communities are as follows:

- Prescribed grazing with brush management and favorable climatic conditions, which allow for adequate plant recovery periods, may cause a shift to the *Big Bluestem/Western Wheatgrass/Green Needlegrass Plant Community*.

Kentucky Bluegrass/Blue Grama Plant Community

This plant community developed with heavy continuous season-long grazing. Kentucky bluegrass dominates the community and can develop into a “sodbound” appearance. Low vigor western wheatgrass can be found scattered throughout the community. Green needlegrass has been greatly reduced. Big bluestem may persist in minor amounts, greatly reduced in vigor and not readily seen. Western yarrow, scurfspea, ragweed, and goldenrod have increased. Nonnative grasses and forbs such as annual bromes, thistle, and cocklebur may invade this plant community.

This plant community is resistant to change due to grazing tolerance of Kentucky bluegrass. A significant amount of production and diversity has been lost when compared to the Big Bluestem/Western Wheatgrass/Green Needlegrass Plant Community. The dominance of Kentucky bluegrass and loss of other desirable species has negatively impacted energy flow and nutrient cycling. Water infiltration is reduced significantly. Soil loss may be accelerated where concentrated flows occur. It will take a very long time with improved management to restore this plant community. 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 an average year:

Growth curve number: SD5801

Growth curve name: Northern Rolling High Plains, cool-season dominant.

Growth curve description: Cool-season dominant.

JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
0	0	4	12	25	36	10	5	4	4	0	0

Transitions or community pathways leading to other plant communities are as follows:

- Under long-term prescribed grazing, including adequate recovery periods, this plant community may eventually move towards a plant community resembling the *Big Bluestem/Western Wheatgrass/Green Needlegrass Plant Community*. This will take a long period of time and intensive management.

Ecological Site Interpretations

Animal Community – Wildlife Interpretations

Major Land Resource Area (MLRA) 58D lies within the drier portion of Northern mixed-grass prairie ecosystem where sagebrush steppes to the west yield to grassland steppes to the east. Prior to European settlement, this area consisted of diverse grass/shrub land habitats interspersed with varying densities of depressional, in-stream wetlands, and woody riparian corridors. These habitats provided critical life cycle components for many of its users. Many species of grassland birds, small mammals, reptiles, amphibians, and herds of roaming bison, elk, and pronghorn were among the inhabitants adapted to this semi-arid region. Roaming herbivores, as well as, several small mammal and insect species, were the primary consumers linking the grassland resources to predators such as the wolf, mountain lion, and grizzly bear, as well as, smaller carnivores such as the coyote, bobcat, fox, and raptors. The black-tailed prairie dog was once abundant; however, the species remains a keystone species within its range. The black-footed ferret, burrowing owl, ferruginous hawk, mountain plover, and swift fox were associated with prairie dog complexes.

Historically, the Northern mixed-grass prairie was a disturbance-driven ecosystem with fire, herbivory and climate functioning as the primary disturbance factors either singly or in combination. Following European settlement, livestock grazing, cropland conversion, elimination of fire, energy development and other anthropogenic factors influenced species composition and abundance. Introduced and invasive species further impacted plant and animal communities. The bison was a historical keystone species but have been extirpated as a free-ranging herbivore. The loss of the bison, reduction of prairie dog colonies, and loss of fire as ecological drivers greatly influenced the character of the remaining native plant communities and altered wildlife habitats. Human development has reduced habitat quality for area-sensitive species.

Within MLRA 58D, the Loamy Overflow Ecological Site (ES) provides upland grassland cover with an associated forb, shrub, and tree component. It was typically part of an expansive grassland landscape that included combinations of Shallow Loamy, Shallow Clayey, Thin Loamy, Thin Claypan, Sandy, Sandy Claypan, Loamy, Sandy Terrace and Clayey ESs.

This ES supports a riparian plant community and remains essentially intact. The floodplain plant community may be composed of mature cottonwood and various age classes of elm, green ash, and boxelder; with a shrub component of wild plum, western snowberry, silver buffaloberry, wild rose, etc. The presence or absence of this tree/shrub component is an important factor influencing wildlife species composition.

Occasional to frequent flooding deposits silt on the site which may allow for potential sprouting of plains cottonwood. This site is subject to invasion of grass species such as annual brome grasses and Kentucky bluegrass. Woody species such as Eastern red cedar, Rocky Mountain juniper, Tamarisk, and Russian olive may invade this site.

This site provides important habitat for grassland, woodland and shrub nesting birds, small rodents, bats, mammalian predators, and a variety of reptiles, amphibians, and insects. Within the MLRA, this site provides the suitable habitat for numerous riparian associated species. This site provides foraging and brood rearing habitat for upland game birds such as greater sage-grouse and sharp-tailed grouse. However, due to the presence of invasive grass and/or woody species ground nesting birds' reproduction is reduced.

Big Bluestem/Western Wheatgrass/Green Needlegrass: The predominance of grasses plus high diversity of forbs and shrubs in this community favors grazers and mixed-feeders, such as white-tailed deer. Plant communities associated with woody habitat provide habitat for songbirds such as brown thrasher, redheaded woodpecker, warbling vireo, yellow warbler, gray catbird, Say's phoebe, loggerhead shrike, Lazuli bunting, yellow breasted chat, and black-headed grosbeak; and raptors such as red-tailed hawk, Swainson's hawk, American kestrel, and great-horned owl. Insects, such as pollinators, play a large role in maintaining the forb community and provide a forage base for birds and other species. Diverse prey populations are available for grassland raptors and mammalian predators, especially bobcat.

The diversity of grasses, forbs, and shrubs provide high nutrition levels for small and large herbivores including voles, mice, thirteen-lined ground squirrel, Eastern cottontail rabbit, white-tailed jackrabbit, and deer. This ES provides excellent fawning habitat for white-tailed deer. The relatively high stature of this plant community provides suitable thermal, protective, and escape cover for small and large mammals. This plant community provides habitat for various amphibian and reptile species such as frogs, toads, salamanders, bull and garter snakes. Introduced bird species such as European starling, ring-necked pheasant, and gray partridge will use this site.

Mixed Shrub/Western Wheatgrass and Western Wheatgrass/Kentucky Bluegrass: Resulting from heavy continuous seasonal grazing, nonuse, or reduction in fire frequency, shrubs and western wheatgrass will dominate. Shrub diversity and density has increased. The tree component remains largely unchanged. Livestock damage to trees is often noticeable. The increase in the shrub component results in increased habitat for yellow warbler, gray catbird, loggerhead shrike, Bell's vireo, brown thrasher, Lazuli bunting, and yellow breasted chat. When present, the tall tree component continues to provide habitat for red-tailed hawk, American kestrel, redheaded woodpecker, warbling vireo, black-headed grosbeak, and Say's phoebe. This plant community provides habitat for various amphibian and reptile species such as frogs, toads, salamanders, bull, and garter snakes.

Resulting from continuous season-long grazing the plant community will become dominated by western wheatgrass and Kentucky bluegrass. The tree, forb, and shrub diversity remains relatively unchanged. The shift from to western wheatgrass and Kentucky bluegrass does not result in a significant change to the wildlife community. Small mammals such as voles and mice may increase due to the presence of Kentucky bluegrass and increased litter. Predators utilizing this plant community include the coyote, red fox, long-tailed weasel, raccoon, and bobcat.

Kentucky Bluegrass/Blue Grama: Resulting from long-term, continuous season-long grazing Kentucky bluegrass and blue grama will dominate this site. Tree and shrub diversity and abundance have greatly decreased. The reduction of the shrub component results in reduced habitat for brown thrasher, yellow warbler, gray catbird, loggerhead shrike, Lazuli bunting, and yellow breasted chat. Loss of tree vigor and canopy reduces habitat quality for warbling vireo and black-headed grosbeak. Increased soil temperature reduces habitat quality for most amphibians.

Ecological processes on this site have been impacted by decreased litter interfering with nutrient and water cycles decreasing forb and graminoid diversity. Runoff increases due to bare ground and decreased litter, resulting in sediment loading and warmer water to adjacent streams.

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

Common Name	Cattle	Sheep	Horses	Deer	Antelope	Bison	Elk
Grasses and Grass-likes							
big bluestem	U D P D	U D U U	U D P D	U D U U	U D U U	U D P D	U D P D
blue grama	U D P U	D P P D	U D P U	D P P D	D P P D	U D P U	U D P U
Canada wildrye	U D U U	N U N N	U D U U	N U N N	N U N N	U D U U	U D U U
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
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
prairie sandreed	U D D U	U D U U	U D D U	U U D U	U U D U	U D D U	U D D U
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
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
tall dropseed	N U N N	N U N N	N U N N	N U N N	N U N N	N U N N	N U N N
western wheatgrass	U P D U	N D N N	U P D U	N D N N	N D N N	U P D U	U P D U
Forbs							
American licorice	U U D U	N U U N	U U D U	N U U N	N U U N	U U D U	N U U N
American vetch	U D P U	U P P U	U D P U	U P P U	U P P U	U D P U	U P P U
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
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
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
Maximilian sunflower	U D P U	U D P U	U D P U	U D P U	U D P U	U D P U	U D P U
meadow anemone	U U U U	U U D U	U U U U	U U D U	U U D U	U U U U	U U U U
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
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
wavyleaf thistle	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 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
Shrubs							
chokecherry	D T T D	D T T D	D T T D	P U D P	D U U D	D T T D	P U U P
currant	D U U D	D U U D	D U U D	D U U D	U U U U	D U U D	D U U D
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
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
silver buffaloberry	D U U U	D U U U	D U U U	P U D P	U U U U	D U U U	D U U U
silver sagebrush	D U U D	D U U D	D U U D	P D D P	P P P P	D U U D	D U U D
snowberry	U U U U	U U U U	U U U U	D U D D	U U U U	U U U U	D U U U
wild plum	D U U D	D U U D	D U U D	P U D D	D U U D	D U U D	D U U D
Trees							
American elm	N N N N	N N N N	N N N N	N U D N	N N N N	N N N N	N N N N
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
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

As this site improves in condition through proper management (from the more short grass dominated plant communities to the interpretive plant community), the advantage for livestock production includes: higher forage production from cool-season grasses, improved early spring forage production, and higher water infiltration. The disadvantage for livestock include: reduction in cool-/warm-season grass mix which would provides better management flexibility, less plant diversity, and a potential increase in soil erosion. The Kentucky Bluegrass/Blue Grama Plant Community is of limited value for livestock production.

Grazing by domestic livestock is one of the major income-producing industries in the area. Rangeland in this area may provide yearlong forage. During the dormant period, the forage for livestock will likely be lacking protein to meet livestock requirements and added protein will allow ruminants to better utilize the energy stored in grazed plant materials. A forage quality test (either directly or through fecal sampling) should be used to determine the level of supplementation needed.

Hydrology Functions

Water is the principal factor limiting forage production on this site. This site is dominated by soils in hydrologic group B. Infiltration and runoff potential for this site varies from low to moderate depending on 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 strong sod and dominate the site. Normally, 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 typically present on this site.

Other Products

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

Supporting Information

Associated Sites

Loamy (R058DY010SD), Sandy (R058DY009SD), Loamy Terrace (R058DY022SD)

Similar Sites

(R058DY022SD) – Loamy Terrace [less big bluestem; less production]

Inventory Data References

Information presented here has been derived from NRCS clipping data and other inventory data. Field observations and experience were also used. Those involved in developing this site description include: Ryan Beer, Range Management Specialist (RMS), NRCS; Chuck Berdan, Biologist (BIO), Bureau of Land Management (BLM); Stan Boltz, RMS, NRCS; Dave Dewald, Wildlife BIO, NRCS; Jody Forman, RMS, NRCS; Dennis Froemke, RMS, NRCS; Tom Juntti, BIO, United States Forest

