

United States Department of Agriculture Natural Resources Conservation Service

Ecological Site Description

Site Type: Rangeland

Site Name: Loamy

Site ID: R061XS010SD

Major Land Resource Area (MLRA): 61 – Black Hills Foot Slopes

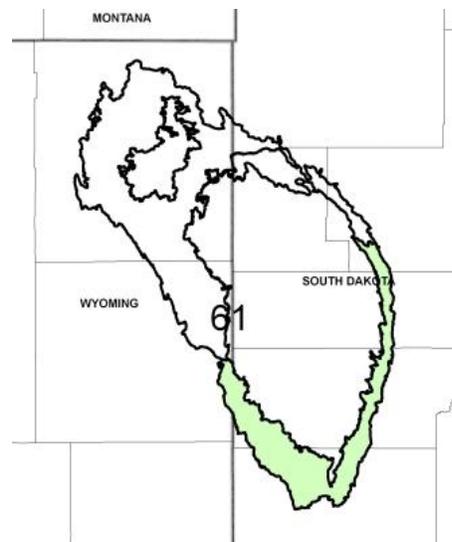
Physiographic Features

This site occurs on nearly level to moderately sloping uplands.

Landform: hill, terrace, plain

Aspect: N/A

| | <u>Minimum</u> | <u>Maximum</u> |
|------------------------------------|----------------|----------------|
| Elevation (feet): | 2,900 | 4,000 |
| Slope (percent): | 1 | 15 |
| Water Table Depth (inches): | None | None |
| Flooding: | | |
| Frequency: | None | None |
| Duration: | None | None |
| Ponding: | | |
| Depth (inches): | None | None |
| Frequency: | None | None |
| Duration: | None | None |
| Runoff Class: | Medium | High |



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 steppes to the east. Annual precipitation ranges from 14 to 19 inches per year with most occurring during the growing season. 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. Cold air outbreaks from Canada in winter move rapidly from northwest to southeast and account for extreme minimum temperatures. Chinook winds may occur in winter and bring rapid rises in temperature. Extreme storms may occur during the winter but most severely affect ranch operations during late winter and spring.

The average annual temperature is about 47°F. January is the coldest month with average temperatures ranging from about 22°F (Hermosa 3 SSW, South Dakota (SD)), to about 25°F (Hot Springs, SD). July is the warmest month with temperatures averaging from about 71°F (Hermosa 3 SSW, SD), to about 73°F (Hot Springs, SD). The range of average monthly temperatures between the coldest and warmest months is about 49°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 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 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): | 129 | 148 |
| Freeze-free period (days): | 144 | 168 |
| Mean Annual Precipitation (inches): | 14 | 19 |

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

| | Precip. Min. | Precip. Max | Temp. Min. | Temp. Max. |
|-----------|--------------|-------------|------------|------------|
| January | 0.32 | 0.49 | 8.6 | 37.9 |
| February | 0.36 | 0.58 | 12.7 | 41.9 |
| March | 0.77 | 1.12 | 20.7 | 49.9 |
| April | 1.77 | 2.10 | 31.8 | 61.0 |
| May | 3.17 | 3.27 | 41.1 | 70.7 |
| June | 3.20 | 3.47 | 51.2 | 80.9 |
| July | 2.34 | 2.69 | 57.7 | 89.3 |
| August | 1.84 | 2.21 | 55.4 | 88.0 |
| September | 1.25 | 1.45 | 45.1 | 78.4 |
| October | 0.98 | 1.34 | 33.9 | 65.5 |
| November | 0.42 | 0.56 | 23.4 | 49.6 |
| December | 0.33 | 0.34 | 12.3 | 39.9 |

| Climate Stations | | Period | |
|------------------|------------------|--------|------|
| Station ID | Location or Name | From | To |
| SD3775 | Hermosa 3 SSW | 1906 | 2009 |
| SD4007 | Hot Springs | 1894 | 2009 |
| SD6947 | Rapid City | 1916 | 2009 |
| SD9347 | Wind Cave | 1948 | 2009 |

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

Riparian and Wetland Features

No riparian areas or wetland features are directly associated with this site.

Representative Soil Features

The typical features of soils in this site are very fine sandy loam to silty clay textured subsurface soils, with slopes ranging from about 1 to 15 percent. The soils in this site are well-drained and formed in residuum, alluvium, and eolian deposits. The loam to silt loam surface layer is four to nine inches thick. The soils have a moderate to moderately slow infiltration rate. This site typically should show slight to no evidence of rills, wind scoured areas, or pedestalled plants. If present, water flow paths are broken, irregular in appearance, or discontinuous. The soil surface is stable and intact. Subsurface soil layers are nonrestrictive to water movement and root penetration.

These soils are mainly susceptible to water erosion. The hazard of water erosion increases on slopes greater than about 10 percent. Loss of 50 percent or more of the surface layer of the soils on this site can result in a shift in species composition and/or production.

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

Parent Material Kind: residuum, alluvium, eolian deposits

Parent Material Origin:

Surface Texture: loam, silt loam

Surface Texture Modifier: none

Subsurface Texture Group: loamy

Surface Fragments ≤3” (% Cover): 0-4

Surface Fragments >3” (%Cover): 0-3

Subsurface Fragments ≤3” (% Volume): 0-7

Subsurface Fragments >3” (% Volume): 0-4

| | <u>Minimum</u> | <u>Maximum</u> |
|---|-----------------|----------------|
| Drainage Class: | well | well |
| Permeability Class: | moderately slow | moderate |
| Depth (inches): | 40 | 80 |
| Electrical Conductivity (mmhos/cm)*: | 0 | 4 |
| Sodium Absorption Ratio*: | 0 | 2 |
| Soil Reaction (1:1 Water)*: | 6.1 | 9.0 |
| Soil Reaction (0.1M CaCl₂)*: | NA | NA |
| Available Water Capacity (inches)*: | 6 | 8 |
| Calcium Carbonate Equivalent (percent)*: | 0 | 25 |

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

Plant Communities

Ecological Dynamics of the Site

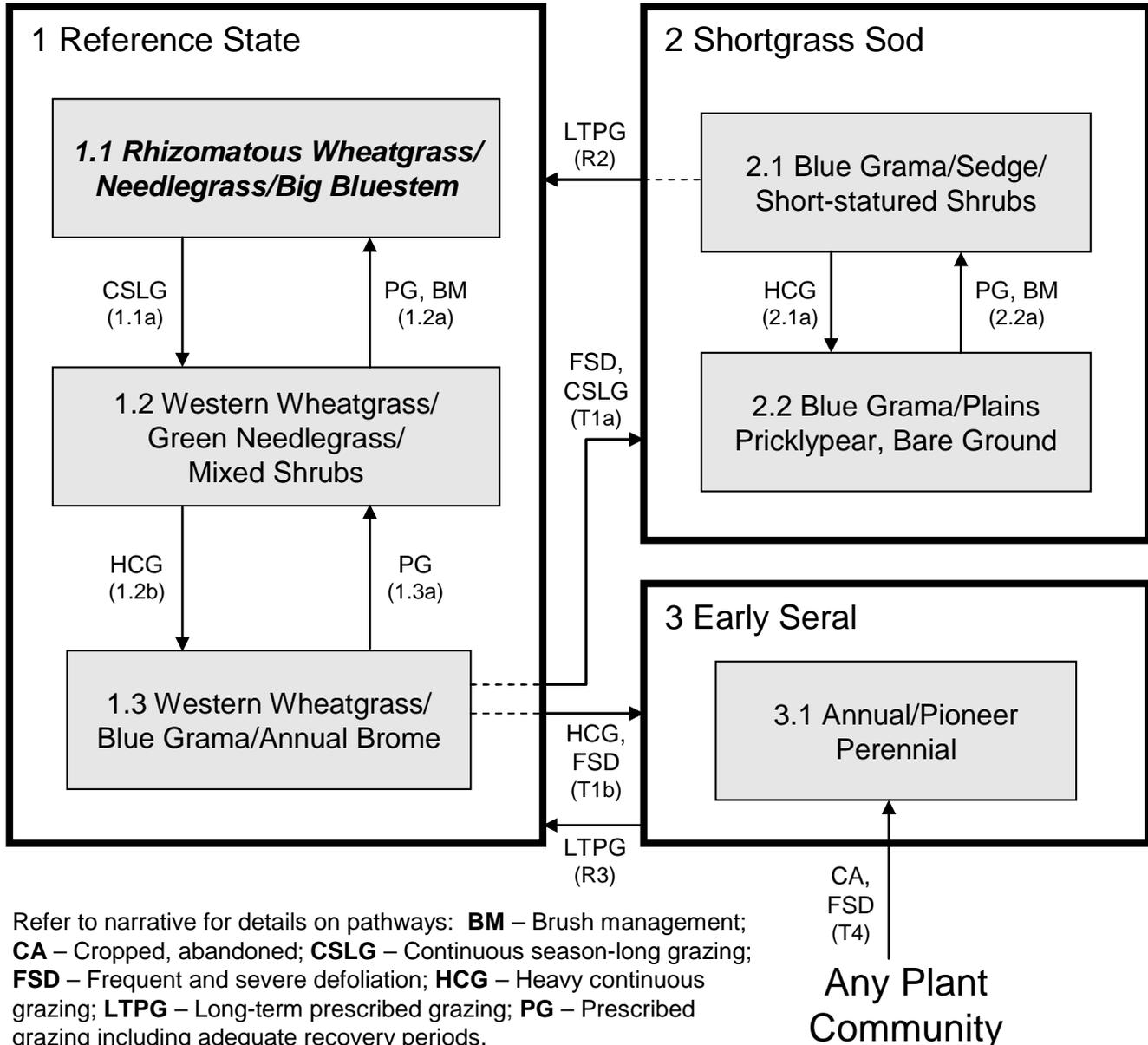
This site developed under Northern Great Plains climatic conditions, light to severe grazing by bison and other large herbivores, sporadic natural or man-caused wildfire (often of light intensities), and other biotic and abiotic factors that typically influence soil/site development. Changes will occur 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 that will occur, severe disturbances, such as periods of well below average precipitation, can cause significant shifts in plant communities and/or species composition.

Continuous season-long grazing (during the typical growing season of May through October) and/or heavy continuous grazing (e.g., every spring and/or every summer at moderate to heavy stocking levels) without adequate recovery periods following grazing events causes departure from the Rhizomatous Wheatgrass/Needlegrass/Big Bluestem Plant Community Phase. Blue grama will increase and eventually develop into a sod. Western wheatgrass will increase initially and then begin to decrease. Needleandthread, green needlegrass, big bluestem, sideoats grama, Indiangrass, and little bluestem will decrease in frequency and production. Excessive defoliation can cause threeawn and annuals to increase and dominate the site. Extended periods of nonuse and/or lack of fire will result in excessive litter and a plant community dominated by cool-season grasses such as green needlegrass, western wheatgrass, and an increase in shrubs.

Interpretations are primarily based on the Rhizomatous Wheatgrass/Needlegrass/Big Bluestem Plant Community Phase (1.1). It 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. Plant community phases, states, transitional pathways, and thresholds have been determined through similar studies and experience.

The following is a diagram that illustrates the common plant community phases that can occur on the site and the transition pathways between communities. These are the most common plant community phases based on current knowledge and experience, and changes may be made as more data is collected. Narratives following the diagram contain more detail pertaining to the ecological processes.

Plant Communities and Transitional Pathways



Plant Community Composition and Group Annual Production

| COMMON/GROUP NAME | SCIENTIFIC NAME | SYMBOL | 1.1 Rhizomatous Wheatgrass/ Needlegrass/Big Bluestem | | | |
|--------------------------------------|--|--------|---|-------------|---------|------|
| | | | Group | Ibs./acre | % Comp | |
| GRASSES & GRASS-LIKES | | | | 1650 - 1870 | 75 - 85 | |
| RHIZOMATOUS WHEATGRASS | | | 1 | 330 - 770 | 15 - 35 | |
| western wheatgrass | Pascopyrum smithii | PASM | 1 | 330 - 660 | 15 - 30 | |
| thickspike wheatgrass | Elymus lanceolatus ssp. lanceolatus | ELLAL | 1 | 0 - 220 | 0 - 10 | |
| NEEDLEGRASS | | | 2 | 330 - 770 | 15 - 35 | |
| needleandthread | Hesperostipa comata ssp. comata | HECOC8 | 2 | 110 - 550 | 5 - 25 | |
| green needlegrass | Nassella viridula | NAV14 | 2 | 110 - 550 | 5 - 25 | |
| TALL WARM-SEASON GRASSES | | | 3 | 44 - 220 | 2 - 10 | |
| big bluestem | Andropogon gerardii | ANGE | 3 | 44 - 220 | 2 - 10 | |
| Indiangrass | Sorghastrum nutans | SONU2 | 3 | 0 - 66 | 0 - 3 | |
| MID WARM-SEASON GRASSES | | | 4 | 110 - 220 | 5 - 10 | |
| sideoats grama | Bouteloua curtipendula | BOCU | 4 | 44 - 220 | 2 - 10 | |
| little bluestem | Schizachyrium scoparium | SCSC | 4 | 22 - 66 | 1 - 3 | |
| plains muhly | Muhlenbergia cuspidata | MUCU3 | 4 | 0 - 66 | 0 - 3 | |
| SHORT SOD GRASSES/GRASS-LIKES | | | 5 | 44 - 110 | 2 - 5 | |
| blue grama | Bouteloua gracilis | BOGR2 | 5 | 22 - 110 | 1 - 5 | |
| hairy grama | Bouteloua hirsuta | BOHI2 | 5 | 0 - 44 | 0 - 2 | |
| threadleaf sedge | Carex filifolia | CAFI | 5 | 22 - 66 | 1 - 3 | |
| sun sedge | Carex inops ssp. heliophila | CAINH2 | 5 | 0 - 44 | 0 - 2 | |
| OTHER NATIVE GRASSES | | | 6 | 44 - 110 | 2 - 5 | |
| prairie junegrass | Koeleria macrantha | KOMA | 6 | 22 - 66 | 1 - 3 | |
| Sandberg bluegrass | Poa secunda | POSE | 6 | 0 - 22 | 0 - 1 | |
| Cusick's bluegrass | Poa cusickii | POCU3 | 6 | 0 - 22 | 0 - 1 | |
| sand dropseed | Sporobolus cryptandrus | SPCR | 6 | 0 - 22 | 0 - 1 | |
| other grasses | | 2GRAM | 6 | 22 - 88 | 1 - 4 | |
| FORBS | | | 8 | 110 - 330 | 5 - 15 | |
| American vetch | Vicia americana | VIAM | 8 | 22 - 44 | 1 - 2 | |
| biscuitroot | Lomatium spp. | LOMAT | 8 | 0 - 22 | 0 - 1 | |
| cinquefoil | Potentilla spp. | POTEN | 8 | 0 - 22 | 0 - 1 | |
| cudweed sagewort | Artemisia ludoviciana | ARLU | 8 | 22 - 44 | 1 - 2 | |
| deathcamas | Zigadenus spp. | ZIGAD | 8 | 0 - 22 | 0 - 1 | |
| dotted gayfeather | Liatris punctata | LIPU | 8 | 22 - 44 | 1 - 2 | |
| erigonum | Eriogonum spp. | ERIOG | 8 | 0 - 22 | 0 - 1 | |
| false boneset | Brickellia eupatorioides | BREU | 8 | 22 - 44 | 1 - 2 | |
| false gromwell | Onosmodium bejariense var. occidentale | ONBEO | 8 | 0 - 22 | 0 - 1 | |
| fleabane | Erigeron spp. | ERIGE2 | 8 | 22 - 44 | 1 - 2 | |
| four o'clock | Mirabilis spp. | MIRAB | 8 | 0 - 22 | 0 - 1 | |
| goldenrod | Solidago spp. | SOLID | 8 | 22 - 44 | 1 - 2 | |
| hairy goldaster | Heterotheca villosa | HEV14 | 8 | 0 - 22 | 0 - 1 | |
| penstemon | Penstemon spp. | PENST | 8 | 22 - 44 | 1 - 2 | |
| prairie clover | Dalea spp. | DALEA | 8 | 22 - 44 | 1 - 2 | |
| prairie coneflower | Ratibida columnifera | RACO3 | 8 | 22 - 44 | 1 - 2 | |
| purple coneflower | Echinacea angustifolia | ECAN2 | 8 | 0 - 22 | 0 - 1 | |
| scarlet gaura | Gaura coccinea | GACO5 | 8 | 22 - 44 | 1 - 2 | |
| scurfpea | Psoralegium spp. | PSORA2 | 8 | 22 - 44 | 1 - 2 | |
| spiny phlox | Phlox hoodii | PHHO | 8 | 0 - 22 | 0 - 1 | |
| star lily | Leucocrinum montanum | LEMO4 | 8 | 0 - 22 | 0 - 1 | |
| western ragweed | Ambrosia psilostachya | AMPS | 8 | 0 - 22 | 0 - 1 | |
| western wallflower | Erysimum capitatum var. capitatum | ERCAC | 8 | 0 - 22 | 0 - 1 | |
| western yarrow | Achillea millefolium var. occidentalis | ACMIO | 8 | 0 - 22 | 0 - 1 | |
| white prairie aster | Symphotrichum falcatum | SYFA | 8 | 22 - 44 | 1 - 2 | |
| wild bergamot | Monarda fistulosa | MOFI | 8 | 0 - 22 | 0 - 1 | |
| native forbs | | 2FN | 8 | 22 - 66 | 1 - 3 | |
| SHRUBS | | | 9 | 110 - 220 | 5 - 10 | |
| big sagebrush | Artemisia tridentata | ARTR2 | 9 | 0 - 66 | 0 - 3 | |
| cactus | Opuntia spp. | OPUNT | 9 | 0 - 22 | 0 - 1 | |
| fringed sagewort | Artemisia frigida | ARFR4 | 9 | 22 - 44 | 1 - 2 | |
| leadplant | Amorpha canescens | AMCA6 | 9 | 22 - 66 | 1 - 3 | |
| rose | Rosa spp. | ROSA5 | 9 | 22 - 44 | 1 - 2 | |
| silver sagebrush | Artemisia cana | ARCA13 | 9 | 0 - 44 | 0 - 2 | |
| western snowberry | Symphoricarpos occidentalis | SYOC | 9 | 22 - 66 | 1 - 3 | |
| other shrubs | | 2SHRUB | 9 | 0 - 66 | 0 - 3 | |
| Annual Production Ibs./acre | | | | LOW | RV | HIGH |
| GRASSES & GRASS-LIKES | | | | 1300 - | 1815 - | 2265 |
| FORBS | | | | 100 - | 220 - | 385 |
| SHRUBS | | | | 100 - | 165 - | 250 |
| TOTAL | | | | 1500 - | 2200 - | 2900 |

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 | 1.1 Rhizomatous Wheatgrass/ Needlegrass/Big Bluestem | | | 1.2 Western Wheatgrass/Green Needlegrass/Mixed Shrubs | | | 1.3 Western Wheatgrass/Blue Grama/Annual Brome | | | 2.1 Blue Grama/Sedge/ Short-statured Shrubs | | |
|------------------------------------|--------|---|--------------------|---------|--|-----------|--------------------|---|-------------------|---------|--|-----------|-------------|
| | | Grp | lbs./acre | % Comp | Grp | lbs./acre | % Comp | Grp | lbs./acre | % Comp | Grp | lbs./acre | % Comp |
| GRASSES & GRASS-LIKES | | | | | | | | | | | | | |
| RHIZOMATOUS WHEATGRASS | | | | | | | | | | | | | |
| western wheatgrass | PASM | 1 | 330 - 770 | 15 - 35 | 1 | 190 - 570 | 10 - 30 | 1 | 180 - 450 | 10 - 25 | 1 | 0 - 140 | 0 - 10 |
| thickspike wheatgrass | ELLAL | 1 | 0 - 220 | 0 - 10 | 1 | 0 - 152 | 0 - 8 | 1 | 0 - 90 | 0 - 5 | | | |
| NEEDLEANDGRASS | | | | | | | | | | | | | |
| needleandthread | HECOC8 | 2 | 330 - 770 | 15 - 35 | 2 | 190 - 475 | 10 - 25 | 2 | 18 - 270 | 1 - 15 | 2 | 14 - 140 | 1 - 10 |
| green needlegrass | NAVI4 | 2 | 110 - 550 | 5 - 25 | 2 | 38 - 285 | 2 - 15 | 2 | 18 - 180 | 1 - 10 | 2 | 14 - 98 | 1 - 7 |
| TALL WARM-SEASON GRASSES | | | | | | | | | | | | | |
| big bluestem | ANGE | 3 | 44 - 220 | 2 - 10 | 3 | 0 - 95 | 0 - 5 | 3 | 0 - 54 | 0 - 3 | 3 | | |
| Indiangrass | SONU2 | 3 | 0 - 66 | 0 - 3 | | | | | | | | | |
| MID WARM-SEASON GRASSES | | | | | | | | | | | | | |
| sideoats grama | BOCU | 4 | 110 - 220 | 5 - 10 | 4 | 19 - 152 | 1 - 8 | 4 | 18 - 126 | 1 - 7 | 4 | 0 - 70 | 0 - 5 |
| little bluestem | SCSC | 4 | 44 - 220 | 2 - 10 | 4 | 19 - 152 | 1 - 8 | 4 | 18 - 108 | 1 - 6 | 4 | 0 - 70 | 0 - 5 |
| plains muhly | MUCU3 | 4 | 22 - 66 | 1 - 3 | 4 | 0 - 38 | 0 - 2 | 4 | 0 - 36 | 0 - 2 | | | |
| SHORT SOD GRASS/GRASS-LIKES | | | | | | | | | | | | | |
| blue grama | BOGR2 | 5 | 44 - 110 | 2 - 5 | 5 | 95 - 285 | 5 - 15 | 5 | 180 - 540 | 10 - 30 | 5 | 280 - 770 | 20 - 55 |
| hairy grama | BOH2 | 5 | 22 - 110 | 1 - 5 | 5 | 38 - 190 | 2 - 10 | 5 | 90 - 270 | 5 - 15 | 5 | 210 - 490 | 15 - 35 |
| threadleaf sedge | CAFI | 5 | 0 - 44 | 0 - 2 | 5 | 0 - 95 | 0 - 5 | 5 | 0 - 144 | 0 - 8 | 5 | 0 - 140 | 0 - 10 |
| sun sedge | CAINH2 | 5 | 22 - 66 | 1 - 3 | 5 | 19 - 95 | 1 - 5 | 5 | 36 - 180 | 2 - 10 | 5 | 70 - 280 | 5 - 20 |
| OTHER NATIVE GRASSES | | | | | | | | | | | | | |
| prairie junegrass | KOMA | 6 | 0 - 44 | 0 - 2 | 6 | 0 - 76 | 0 - 4 | 6 | 0 - 90 | 0 - 5 | 6 | 0 - 112 | 0 - 8 |
| Sandberg bluegrass | POSE | 6 | 44 - 110 | 2 - 5 | 6 | 19 - 95 | 1 - 5 | 6 | 18 - 90 | 1 - 5 | 6 | 14 - 112 | 1 - 8 |
| Cusick's bluegrass | POCU3 | 6 | 22 - 66 | 1 - 3 | 6 | 19 - 57 | 1 - 3 | 6 | 18 - 36 | 1 - 2 | 6 | 14 - 28 | 1 - 2 |
| sand dropseed | SPCR | 6 | 0 - 22 | 0 - 1 | 6 | 0 - 19 | 0 - 1 | 6 | 0 - 36 | 0 - 2 | 6 | 0 - 42 | 0 - 3 |
| other grasses | 2GRAM | 6 | 0 - 22 | 0 - 1 | 6 | 0 - 38 | 0 - 2 | 6 | 0 - 54 | 0 - 3 | 6 | 0 - 70 | 0 - 5 |
| NON-NATIVE GRASSES | | | | | | | | | | | | | |
| bluegrass | POA | 7 | 22 - 88 | 1 - 4 | 7 | 0 - 57 | 0 - 3 | 7 | 0 - 54 | 0 - 3 | 7 | 0 - 42 | 0 - 3 |
| cheatgrass | BRTE | 7 | | | 7 | 19 - 133 | 1 - 7 | 7 | 90 - 270 | 5 - 15 | 7 | 14 - 140 | 1 - 10 |
| FORBS | | | | | | | | | | | | | |
| American vetch | VIAM | 8 | 110 - 330 | 5 - 15 | 8 | 95 - 285 | 5 - 15 | 8 | 90 - 270 | 5 - 15 | 8 | 70 - 140 | 5 - 10 |
| biscuitroot | LOMAT | 8 | 22 - 44 | 1 - 2 | 8 | 0 - 19 | 0 - 1 | | | | | | |
| cinquefoil | POTEN | 8 | 0 - 22 | 0 - 1 | 8 | 0 - 19 | 0 - 1 | 8 | 0 - 18 | 0 - 1 | | | |
| cudweed sagewort | ARLU | 8 | 0 - 22 | 0 - 1 | 8 | 19 - 38 | 1 - 2 | 8 | 18 - 90 | 1 - 5 | 8 | 14 - 56 | 1 - 4 |
| deathcamas | ZIGAD | 8 | 22 - 44 | 1 - 2 | 8 | 19 - 76 | 1 - 4 | 8 | 0 - 18 | 0 - 1 | 8 | 0 - 14 | 0 - 1 |
| dotted gayfeather | LIPU | 8 | 0 - 22 | 0 - 1 | 8 | 0 - 19 | 0 - 1 | 8 | 0 - 18 | 0 - 1 | | | |
| erigonum | ERIOG | 8 | 22 - 44 | 1 - 2 | 8 | 0 - 19 | 0 - 1 | 8 | 0 - 18 | 0 - 1 | | | |
| false boneset | BREU | 8 | 0 - 22 | 0 - 1 | 8 | 0 - 19 | 0 - 1 | | | | | | |
| false gromwell | ONBEO | 8 | 0 - 22 | 0 - 1 | 8 | 0 - 19 | 0 - 1 | | | | | | |
| fleabane | ERIGE2 | 8 | 22 - 44 | 1 - 2 | 8 | 19 - 38 | 1 - 2 | 8 | 0 - 18 | 0 - 1 | | | |
| four o'clock | MIRAB | 8 | 0 - 22 | 0 - 1 | | | | | | | | | |
| goldenrod | SOLID | 8 | 22 - 44 | 1 - 2 | 8 | 19 - 57 | 1 - 3 | 8 | 18 - 54 | 1 - 3 | 8 | 14 - 42 | 1 - 3 |
| hairy goldaster | HEVI4 | 8 | 0 - 22 | 0 - 1 | | | | | | | | | |
| penstemon | PENST | 8 | 0 - 22 | 0 - 1 | 8 | 0 - 19 | 0 - 1 | | | | | | |
| prairie clover | DALEA | 8 | 22 - 44 | 1 - 2 | 8 | 0 - 19 | 0 - 1 | | | | | | |
| prairie coneflower | RACO3 | 8 | 0 - 22 | 0 - 1 | 8 | 19 - 38 | 1 - 2 | 8 | 0 - 18 | 0 - 1 | | | |
| purple coneflower | ECAN2 | 8 | 22 - 44 | 1 - 2 | 8 | 0 - 19 | 0 - 1 | | | | | | |
| scarlet gaura | GACO5 | 8 | 0 - 22 | 0 - 1 | 8 | 0 - 19 | 0 - 1 | | | | | | |
| scurfpea | PSORA2 | 8 | 22 - 44 | 1 - 2 | 8 | 0 - 19 | 0 - 1 | 8 | 18 - 54 | 1 - 3 | 8 | 14 - 28 | 1 - 2 |
| spiny phlox | PHHO | 8 | 22 - 44 | 1 - 2 | 8 | 19 - 38 | 1 - 2 | 8 | 0 - 18 | 0 - 1 | 8 | 0 - 14 | 0 - 1 |
| star lily | LEMO4 | 8 | 0 - 22 | 0 - 1 | 8 | 0 - 19 | 0 - 1 | 8 | 0 - 18 | 0 - 1 | | | |
| western ragweed | AMPS | 8 | 0 - 22 | 0 - 1 | 8 | 19 - 38 | 1 - 2 | 8 | 18 - 54 | 1 - 3 | 8 | 14 - 28 | 1 - 2 |
| western wallflower | ERCAC | 8 | 0 - 22 | 0 - 1 | 8 | 0 - 19 | 0 - 1 | | | | | | |
| western yarrow | ACMIO | 8 | 0 - 22 | 0 - 1 | 8 | 0 - 19 | 0 - 1 | 8 | 18 - 36 | 1 - 2 | 8 | 14 - 28 | 1 - 2 |
| white prairie aster | SYFA | 8 | 22 - 44 | 1 - 2 | 8 | 19 - 38 | 1 - 2 | 8 | 18 - 36 | 1 - 2 | 8 | 14 - 28 | 1 - 2 |
| wild bergamot | MOFI | 8 | 0 - 22 | 0 - 1 | 8 | 0 - 19 | 0 - 1 | 8 | 0 - 18 | 0 - 1 | | | |
| native forbs | 2FN | 8 | 0 - 22 | 0 - 1 | 8 | 0 - 19 | 0 - 1 | 8 | 0 - 18 | 0 - 1 | 8 | 0 - 14 | 0 - 1 |
| introduced forbs | 2FI | 8 | 22 - 66 | 1 - 3 | 8 | 0 - 57 | 0 - 3 | 8 | 0 - 54 | 0 - 3 | 8 | 0 - 42 | 0 - 3 |
| SHRUBS | | | | | | | | | | | | | |
| big sagebrush | ARTR2 | 9 | 110 - 220 | 5 - 10 | 9 | 95 - 380 | 5 - 20 | 9 | 90 - 270 | 5 - 15 | 9 | 70 - 210 | 5 - 15 |
| cactus | OPUNT | 9 | 0 - 66 | 0 - 3 | 9 | 0 - 152 | 0 - 8 | 9 | 0 - 54 | 0 - 3 | 9 | 0 - 28 | 0 - 2 |
| fringed sagewort | ARFR4 | 9 | 0 - 22 | 0 - 1 | 9 | 19 - 57 | 1 - 3 | 9 | 18 - 72 | 1 - 4 | 9 | 14 - 70 | 1 - 5 |
| leadplant | AMCA6 | 9 | 22 - 44 | 1 - 2 | 9 | 19 - 95 | 1 - 5 | 9 | 18 - 126 | 1 - 7 | 9 | 14 - 112 | 1 - 8 |
| rose | ROSA5 | 9 | 22 - 66 | 1 - 3 | 9 | 0 - 38 | 0 - 2 | | | | | | |
| silver sagebrush | ARCA13 | 9 | 22 - 44 | 1 - 2 | 9 | 19 - 57 | 1 - 3 | 9 | 18 - 36 | 1 - 2 | 9 | 0 - 14 | 0 - 1 |
| western snowberry | SYOC | 9 | 0 - 44 | 0 - 2 | 9 | 0 - 57 | 0 - 3 | 9 | 0 - 36 | 0 - 2 | 9 | 0 - 14 | 0 - 1 |
| other shrubs | 2SHRUB | 9 | 22 - 66 | 1 - 3 | 9 | 38 - 190 | 2 - 10 | 9 | 18 - 90 | 1 - 5 | 9 | 14 - 42 | 1 - 3 |
| 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 | | | 1300 - 1815 - 2265 | | 1120 - 1473 - 1720 | | 1030 - 1440 - 1780 | | 770 - 1155 - 1505 | | | | |
| FORBS | | | 100 - 220 - 385 | | 90 - 190 - 330 | | 85 - 180 - 310 | | 65 - 105 - 155 | | | | |
| SHRUBS | | | 100 - 165 - 250 | | 90 - 238 - 450 | | 85 - 180 - 310 | | 65 - 140 - 240 | | | | |
| TOTAL | | | 1500 - 2200 - 2900 | | 1300 - 1900 - 2500 | | 1200 - 1800 - 2400 | | 900 - 1400 - 1900 | | | | |

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

Reference State (State 1)

This state represents the natural range of variability that dominates the dynamics of this ecological site (ES). This state was dominated by cool-season grasses with warm-season grasses being subdominant. In pre-European times, the primary disturbance mechanisms for this site in the reference condition included frequent fire and grazing by large herding ungulates. Timing of fires and grazing coupled with weather events dictated the dynamics that occurred within the natural range of variability. Taller cool- and warm-season grasses would have declined and a corresponding increase in short statured grass and grass-like species would have occurred. Today, a similar state can be found on areas that are properly managed with grazing and/or prescribed burning, and sometimes on areas receiving occasional short periods of rest.

1.1 Rhizomatous Wheatgrass/Needlegrass/Big Bluestem Plant Community Phase

Interpretations are based primarily on the Rhizomatous Wheatgrass/Needlegrass/Big Bluestem Plant Community Phase (this is also considered to be climax). The potential vegetation is about 75 percent grasses or grass-like plants, 15 percent forbs, and 10 percent shrubs. The community is dominated by cool-season grasses with warm-season grasses being subdominant. The major grasses include western wheatgrass, needleandthread, green needlegrass, big bluestem, and sideoats grama. Other grass or grass-like species include blue grama, thickspike wheatgrass, Indiangrass, plains muhly, prairie dropseed, and threadleaf sedge. This plant community is resilient and well adapted to the Northern Great Plains climatic conditions. The diversity in plant species allows for high drought tolerance. This is a sustainable plant community in regards to site/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 an average year:

Growth curve number: SD6102

Growth curve name: Black Hills Foot Slopes, 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 pathways leading to other plant communities were as follows:

- 1.1a – Continuous season-long grazing or prolonged periods with very light use or no use and a lack of fire will cause this plant community to shift to the *Western Wheatgrass/Green Needlegrass/Mixed Shrubs Plant Community Phase (1.2)*. With continuous season-long grazing, some areas will receive little or no grazing while other areas will be repeatedly grazed.

1.2 Western Wheatgrass/Green Needlegrass/Mixed Shrubs Plant Community Phase

This plant community phase is a result of continuous season-long grazing or prolonged periods of light use or nonuse and a lack of fire. The potential vegetation is about 65 percent grasses or grass-like plants, 15 percent forbs, and 20 percent shrubs. The community is dominated by cool-season grasses with warm-season being subdominant. The major grasses include western wheatgrass, green needlegrass, needleandthread, and blue grama. Other grass or grass-like species include sideoats grama, thickspike wheatgrass, hairy grama, big bluestem, threadleaf sedge, and sun sedge. Kentucky bluegrass and cheatgrass also begin to invade and shrubs increase significantly. Forbs commonly include cudweed sagewort, goldenrod, scurfpea, white prairie aster, and western ragweed. Shrubs include western snowberry, fringed sagewort, rose, and in some areas, big sagebrush.

This plant community is resilient and well adapted to the Northern Great Plains climatic conditions. The diversity in plant species allows for high drought tolerance. This is a sustainable plant community in regards to site/soil stability, watershed function, and biologic integrity. However, blue grama and sedge have increased and runoff and infiltration will begin to be negatively affected.

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: SD6102

Growth curve name: Black Hills Foot Slopes, 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 pathways leading to other plant communities are as follows:

- 1.2b – Heavy continuous grazing (stocking levels well above carrying capacity for extended portions of the growing season) or a combination of disturbances for extended periods of time will lead to the *1.3 Western Wheatgrass/Blue Grama/Annual Brome Plant Community Phase*.
- 1.2a – Prescribed grazing (alternating season of use and providing adequate recovery periods) or periodic light to moderate grazing possibly including periodic rest will convert this plant community to the *1.1 Rhizomatous Wheatgrass/Needlegrass/Big Bluestem Plant Community Phase*. Brush management may expedite this shift.

1.3 Western Wheatgrass/Blue Grama/Annual Brome Plant Community Phase

This plant community evolves under heavy continuous grazing or from over utilization during extended drought periods. The potential plant community is made up of approximately 70 percent grasses and grass-like species, 15 percent forbs, and 15 percent shrubs. Dominant grasses include western wheatgrass, blue grama, and threadleaf sedge. Annual brome (cheatgrass and/or Japanese brome) may also invade and become significant. Grasses of secondary importance include needleandthread, green needlegrass, hairy grama, sideoats grama, and Kentucky bluegrass. Forbs commonly found in this plant community include cudweed sagewort, goldenrod, scurfpea, and western ragweed.

When compared to the Rhizomatous Wheatgrass/Needlegrass/Big Bluestem Plant Community Phase (1.1), blue grama and threadleaf sedge have increased. Needleandthread, green needlegrass, and other tall and mid-statured grasses have decreased and production is also reduced. This plant community is moderately resistant to change. The herbaceous species present are well adapted to grazing; however, species composition can be altered through long-term overgrazing. If the herbaceous component is intact, it tends to be resilient if the disturbance is not long-term.

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: SD6102

Growth curve name: Black Hills Foot Slopes, 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 pathways leading to other plant communities are as follows:

- 1.3a – Prescribed grazing (alternating season of use and providing adequate recovery periods) or periodic light to moderate grazing possibly including periodic rest will convert this plant community to the *1.2 Western Wheatgrass/Green Needlegrass/Mixed Shrubs Plant Community Phase* or possibly to the *1.1 Rhizomatous Wheatgrass/Needlegrass/Big Bluestem Plant Community Phase*.
- T1a – Continuous season-long grazing over extended periods of time or the beginnings of frequent and severe defoliation (as occurs adjacent to prairie dog colonies) will tend to shift this plant community over a threshold leading to the *Shortgrass Sod State (State 2)*.
- T1b – Heavy continuous grazing (typically very heavy grazing for extended periods of time) or frequent and severe defoliation (as occurs with occupation by prairie dogs) will shift this plant community over a threshold leading to the *3.1 Annual/Pioneer Perennial Plant Community Phase* within the *Early Seral State (State 3)*.

Shortgrass Sod State (State 2)

This state typically occurs as a result on continuous season-long grazing at moderate to heavy stocking levels over extended periods of time. Gradually short-statured species such as blue grama and threadleaf sedge become dominant. This change in plant composition alters the hydrologic cycle increasing runoff and reducing infiltration. This is due to the compact, short depth of the rooting structure of the dominant species, and in the advanced stages, to the increased bare ground.

2.1 Blue Grama/Sedge/Short-statured Shrubs Plant Community Phase

This plant community evolved under moderate to heavy continuous season-long grazing or from over utilization during extended drought periods. This plant community may also exist adjacent to prairie dog colonies. The potential plant community is made up of approximately 75 percent grasses and grass-like species, 10 percent forbs, and 15 percent shrubs. Dominant grasses typically include blue grama and threadleaf sedge. Grasses of secondary importance include western wheatgrass, hairy grama, sun sedge, needleandthread, and sand dropseed. Forbs commonly found in this plant community include cudweed sagewort, goldenrod, scurfpea, western ragweed, and western yarrow. When compared to the Rhizomatous Wheatgrass/Needlegrass/Big Bluestem Plant Community Phase (1.1), blue grama and threadleaf sedge are dominant on this plant community. Cool-season grasses have decreased significantly. This vegetation state is very resistant to change. The herbaceous species present are well adapted to grazing; however, composition can be altered through long-term prescribed grazing. This plant community has significantly less production. The thick sod prevents other species from getting established. Lack of litter and reduced plant vigor causes higher soil temperatures, poor water infiltration rates, and high evapotranspiration which gives blue grama a competitive advantage over most other grasses. Soil erosion will be minimal due to the sod forming habit of blue grama and buffalograss.

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: SD6104

Growth curve name: Black Hills Foot Slopes, warm-season dominant, cool-season subdominant.

Growth curve description: Warm-season dominant, cool-season subdominant.

| JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP | OCT | NOV | DEC |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| 0 | 0 | 3 | 7 | 17 | 25 | 25 | 15 | 7 | 1 | 0 | 0 |

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

- 2.1a – Heavy continuous grazing (stocking levels well above carrying capacity for extended portions of the growing season) or a combination of disturbances for extended periods of time will lead to the *2.2 Blue Grama/Plains Pricklypear, Bare Ground Plant Community Phase*.
- R2 – Long-term prescribed grazing (alternating season of use and providing adequate recovery periods) or periodic light to moderate grazing possibly including periodic rest may eventually shift this plant community over a threshold to the *Reference State (State 1)*.

2.2 Blue Grama/Plains Pricklypear, Bare Ground Plant Community Phase

This plant community is a result of heavy continuous grazing over extended periods of time or from a combination of prolonged periods of below-average precipitation and other disturbances. This plant community is similar to the 2.1 Blue Grama/Sedge/Short-statured Shrubs Plant Community Phase, but the grass cover has been reduced even further and bare ground has increased. Short-statured shrubs such as plains pricklypear and broom snakeweed also have increased. The total annual production is typically about 900 pounds per acre on an air-dry weight basis. Runoff is increased even further due to the increase in bare ground, and erosion will begin to increase.

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: SD6105

Growth curve name: Black Hills Foot Slopes, warm-season dominant.

Growth curve description: Warm-season dominant.

| JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP | OCT | NOV | DEC |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| 0 | 0 | 2 | 5 | 15 | 25 | 30 | 15 | 7 | 1 | 0 | 0 |

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

- 2.2a – Prescribed grazing (alternating season of use and providing adequate recovery periods) or periodic light to moderate grazing possibly including periodic rest will convert this plant community to the *2.1 Blue Grama/Sedge/Short-statured Shrubs Plant Community Phase*. Brush management may also be needed to expedite this pathway.

Early Seral State (State 3)

This state is the result of very heavy, concentrated disturbance such as cropping, concentrated rodent activity, or concentrated livestock areas. This state can also result from invasion by highly competitive weed species such as Canada thistle, hound's tongue, leafy spurge, or knapweeds. In most cases, this phase is dominated by annual and/or pioneer perennial species. Bare ground is also typically much higher than on any other plant community phase.

3.1 Annual/Pioneer Perennial Plant Community Phase

This plant community developed under continuous heavy grazing or other excessive disturbances (e.g., heavy use areas, abandoned cropland, defoliation by rodents, etc.). The potential plant community is made up of approximately 60 to 80 percent grasses and grass-like species, 15 to 35 percent forbs, and 2 to 5 percent shrubs. The dominant grass is often threeawn. Other grasses may include cheatgrass, annual brome grass (Japanese brome and cheatgrass), sedge, blue grama, sand dropseed, bluegrass, and western wheatgrass. The dominant forbs include fetid marigold, sweet clover, western ragweed, cudweed sagewort, and other invader-like species. The dominant shrubs include fringed sagewort, broom snakeweed, and cactus. A wide variety of other early seral plant species can occupy this site in varying amounts. This plant community is susceptible to invasion of Canada thistle and other nonnative species because of the relatively high percent of bare ground.

Compared to the Rhizomatous Wheatgrass/Needlegrass/Big Bluestem Plant Community Phase (1.1), red threeawn, annual brome grasses, and percent of bare ground has increased. Western wheatgrass, needlegrasses and other cool-season grasses have decreased as have the warm-season species including big bluestem, sideoats grama, and little bluestem. Plant diversity is low (plant richness may be high but areas are often dominated by a few species). The ecological processes are difficult to restore because of the loss of plant diversity and overall soil disturbance. Soil erosion is potentially very high because of the bare ground and shallow rooted herbaceous plant community. Water runoff will increase and infiltration will decrease due to animal related soil compaction and loss of root mass due to low plant diversity and vigor. This plant community will require significant economic inputs and time to move towards another plant community. This movement is highly variable in its succession. This is due to the loss of diversity (including the loss of the seed bank), within the existing plant community, and the plant communities on adjacent sites.

Transitions or restoration pathways leading to other states are as follows:

- R2 – Long-term prescribed grazing (alternating season of use and providing adequate recovery periods) or periodic light to moderate grazing possibly including periodic rest may eventually shift this plant community over a threshold to the *Reference State (State 1)*.

Ecological Site Interpretations

Animal Community – Wildlife Interpretations

-- Under Development --

Rhizomatous Wheatgrass/Needlegrass/Big Bluestem Plant Community Phase (1.1):

Western Wheatgrass/Green Needlegrass/Mixed Shrubs Plant Community Phase (1.2):

Western Wheatgrass/Blue Grama/Annual Brome Plant Community Phase (1.3):

Blue Grama/Sedge/Short-statured Shrubs Plant Community Phase (2.1):

Blue Grama/Plains Pricklypear, Bare Ground Plant Community Phase (2.2):

Annual/Pioneer Perennial Plant Community Phase (3.1):

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 |
| Cusick's bluegrass | U P U D | D P U D | U P U D | U P N D | U P N D | U P U D | U P U D |
| green needlegrass | U P U D | N P N P | U P U D | N P N P | N P N P | U P U D | U P U D |
| hairy 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 |
| Indiangrass | U D P D | U D U U | U D P D | U D U U | U D U U | U D P D | U D P D |
| little bluestem | U D D U | N D N N | U D D U | N D N N | N D N N | U D D U | U D D U |
| needleandthread | U D U D | N D N U | U D U D | N D N U | N D N U | U D U D | U D U D |
| plains muhly | U U D U | U U D U | U U D U | N N N N | N N N N | U U D U | U U D U |
| prairie junegrass | U D U D | N D N U | U D U D | N D N U | N D N U | U D U D | U D U D |
| sand 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 |
| Sandberg bluegrass | N U N N | N D N N | N U N N | N D N N | N D N N | N U N N | N U N N |
| sideoats grama | U D P U | U P D U | U D P U | U P D U | U P D U | U D P U | U D P U |
| sun 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 |
| thickspike wheatgrass | 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 |
| threadleaf sedge | U D U D | U P N D | U D U D | U D U D | U D U D | U D U D | U D U D |
| western wheatgrass | U P D U | N D N N | U P D U | N D N N | N D N N | U P D U | U P D U |
| Forbs | | | | | | | |
| 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 |
| biscuitroot | U D U U | U D D U | U D U U | U D D U | U D D U | U D U U | U D D 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 |
| deathcamas | 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 |
| dotted gayfeather | 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 |
| eriogonum | 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 |
| false boneset | U U D U | N D U N | U U D U | N D U N | N D U N | U U D U | N D U N |
| false gromwell | 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 |
| fleabane | U U U U | N U U N | U U U U | N U U N | N U U N | U U U U | N U U N |
| four o'clock | 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 |
| 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 |
| hairy goldaster | U U D U | N N N N | U U D U | N N N N | N N N N | U U D U | N N N N |
| penstemon | U U U U | U P P U | U U U U | U P P U | U P P U | U U U U | U P P U |
| 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 |
| 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 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 |
| scarlet gaura | 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 |
| 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 |
| spiny phlox | U D U U | U P P U | U D U U | U P P U | U P P U | U D U U | U P P U |
| star lily | 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 ragweed | U U U U | N N N N | U U U U | N N N N | N N N N | U U U U | N N N N |
| western wallflower | U D U U | N U U N | U D U U | N U U N | N U U N | U D U U | N U U N |
| western yarrow | U U U U | N U U N | U U U U | N U U N | N U U N | U U U U | N U U N |
| 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 |
| wild bergamot | 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 |
| Shrubs | | | | | | | |
| big sagebrush | U N U U | D U U D | U N U U | P U D P | P P P P | U N U U | D U U U |
| cactus | 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 |
| fringed sagewort | U U U U | U U U U | U U U U | U D D U | U P P D | U U U U | U U U D |
| leadplant | U P D U | U P D U | U P D U | U P D U | U P D U | U P D U | U P D U |
| 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 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 |
| western snowberry | U U U U | U U U U | U U U U | D U D D | U U U U | U U U U | D U U U |

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

† 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 annual, suggested initial stocking rates with average growing conditions. These are conservative estimates that should be used only as guidelines in the initial stages of conservation planning. Often, the current plant composition does not entirely match any particular plant community (as described in this ES description). Because of this, a resource inventory is necessary to document plant composition and production. More accurate carrying capacity estimates should eventually be calculated using the following stocking rate information along with animal preference data and actual stocking records, 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 | Average Annual Production (lbs./acre, air-dry) | Stocking Rate* (AUM/acre) |
|---|---|------------------------------|
| Rhizomatous Wheatgrass/Needlegrass/Big Bluestem (1.1) | 2,200 | 0.60 |
| Western Wheatgrass/Green Needlegrass/Mixed Shrubs (1.2) | 1,900 | 0.52 |
| Western Wheatgrass/Blue Grama/Annual Brome (1.3) | 1,800 | 0.49 |
| Blue Grama/Sedge/Short-statured Shrubs (2.1) | 1,400 | 0.38 |
| Blue Grama/Plains Pricklypear, Bare Ground (2.2) | 900 | 0.25 |
| Annual/Pioneer Perennial (3.1) | 800 | 0.22 |

*Based on 912 lbs./acre (air-dry weight) per Animal Unit Month (AUM), and on 25 percent harvest efficiency (refer to the United States Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS) National Range and Pasture Handbook).

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 and C. Infiltration and runoff potential for this site varies from moderate to high depending on soil hydrologic group, slope, and ground cover. In many cases, areas with greater than 75 percent ground cover have the greatest potential for high infiltration and lower runoff. An example of an exception would be where shortgrasses form a strong sod and dominate the site. Dominance by blue grama, buffalograss, bluegrass, and/or smooth brome grass will result in reduced infiltration and increased runoff. 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, hiking, photography, bird watching, and other opportunities. The wide varieties of plants that 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

Thin Upland (R061XS012SD), Shallow Loamy (R061XS024SD), Loamy Overflow (R061XY020SD)

Similar Sites

(R061XY020SD) – Loamy Overflow [more big bluestem; higher production]

(R061XS011SD) – Clayey [more green needlegrass; less needleandthread and big bluestem]

Inventory Data References

Information presented here has been derived from NRCS clipping data and other inventory data. Field observations from range-trained personnel were also used. Those involved in developing this site include: Stan Boltz, Range Management Specialist (RMS), NRCS; Cynthia Englebert, RMS, Forest Service; George Gamblin, RMS, NRCS; Tate Lantz, RMS, NRCS; Ryan Murray, RMS, NRCS; Cheryl Nielsen, RMS, NRCS; L. Michael Stirling, RMS, NRCS; and Jim Westerman, Soil Scientist, NRCS.

State Correlation

This site has been correlated with SD and WY in MLRA 61.

Field Offices/Counties

Hot Springs, SD Custer and Fall River Rapid City, SD Pennington Sturgis, SD Meade

Relationship to Other Established Classifications

Level IV Ecoregions of the Conterminous United States: 17a – Black Hills Foothills.

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://www.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

SD, State Range Management Specialist

Date

WY, State Range Management Specialist

Date