

United States Department of Agriculture Natural Resources Conservation Service

Ecological Site Description

Site Type: Rangeland

Site Name: Sandy

Site ID: R063AY009SD

Major Land Resource Area (MLRA): 63A –
Northern Rolling Pierre Shale Plains



Physiographic Features

This site typically occurs on gently to steeply sloping uplands.

Landform: terrace, floodplain, hill, swale

Aspect: N/A

| | <u>Minimum</u> | <u>Maximum</u> |
|------------------------------------|----------------|----------------|
| Elevation (feet): | 1600 | 2700 |
| Slope (percent): | 0 | 30 |
| 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: | Negligible | Low |

Climatic Features

MLRA 63A is considered to have a continental climate – cold winters and hot summers, low humidity, light rainfall, and much sunshine. Extremes in temperature may also abound. The climate is the result of this MLRA's location near the geographic center of North America. There are few natural barriers on the Northern Great Plains and air masses move freely across the plains and account for rapid changes in temperature.

Annual precipitation ranges from 16 to 20 inches per year. The average annual temperature is about 47°F. January is the coldest month with average temperatures ranging from about 11°F (Pollock, South Dakota (SD)), to about 22°F (Cedar Butte, SD). July is the warmest month with temperatures averaging from about 72°F (Pollock, SD), to about 76°F (Cedar Butte, SD). The range of normal average monthly temperatures between the coldest and warmest months is about 58°F. This large annual range attests to the continental nature of this area'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 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. Green up 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): | 126 | 149 |
| Freeze-free period (days): | 149 | 165 |
| Mean Annual Precipitation (inches): | 16 | 20 |

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

| | Precip. Min. | Precip. Max | Temp. Min. | Temp. Max. |
|-----------|---------------------|--------------------|-------------------|-------------------|
| January | 0.40 | 0.41 | -0.9 | 34.0 |
| February | 0.44 | 0.49 | 5.8 | 39.2 |
| March | 0.87 | 1.36 | 17.3 | 49.0 |
| April | 1.77 | 2.18 | 31.3 | 61.2 |
| May | 2.82 | 3.29 | 43.3 | 72.2 |
| June | 2.96 | 3.45 | 53.2 | 82.5 |
| July | 2.04 | 2.84 | 58.5 | 90.8 |
| August | 1.57 | 2.38 | 56.5 | 90.3 |
| September | 1.13 | 1.53 | 45.4 | 79.2 |
| October | 1.02 | 1.38 | 33.4 | 65.7 |
| November | 0.48 | 0.63 | 19.3 | 48.2 |
| December | 0.23 | 0.35 | 5.7 | 37.2 |

| Climate Stations | | Period | |
|-------------------------|-------------------------|---------------|-----------|
| Station ID | Location or Name | From | To |
| SD1539 | Cedar Butte | 1951 | 2004 |
| SD1972 | Cottonwood 3 E | 1909 | 2004 |
| SD6712 | Pollock | 1948 | 2004 |
| SD6790 | Presho 7 NW | 1975 | 2004 |

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 soils in this site are moderately well to somewhat excessively drained and formed in eolian sand or alluvium. The surface layer is 3 to 21 inches thick, but typically 4 to 8 inches thick. The texture of the subsurface ranges from loamy sand to clay loam. Slopes range from 0 to 30 percent. This site 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.

These soils are mainly susceptible to water erosion. The hazard of water erosion increases on slopes greater than about 15 percent. Low available water capacity caused by the shallow rooting depth

strongly influences the soil-water-plant relationship. Loss of the soil surface layer 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
Parent Material Origin: sandstone
Surface Texture: fine sandy loam
Surface Texture Modifier: none
Subsurface Texture Group: loamy
Surface Fragments ≤3" (% Cover): 0-25
Surface Fragments >3" (%Cover): 0
Subsurface Fragments ≤3" (% Volume): 0-25
Subsurface Fragments >3" (% Volume): 0

| | <u>Minimum</u> | <u>Maximum</u> |
|---|----------------|----------------------|
| Drainage Class | well | somewhat excessively |
| Permeability Class: | moderate | rapid |
| Depth to Bedrock (inches): | 80 | 80 |
| Electrical Conductivity (mmhos/cm)*: | 0 | 2 |
| Sodium Absorption Ratio*: | 0 | 0 |
| Soil Reaction (1:1 Water)*: | 6.1 | 8.4 |
| Soil Reaction (0.1M CaCl2)*: | NA | NA |
| Available Water Capacity (inches)*: | 5 | 7 |
| Calcium Carbonate Equivalent (percent)*: | 0 | 30 |

*These attributes represent 0-40 inches in depth 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 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.

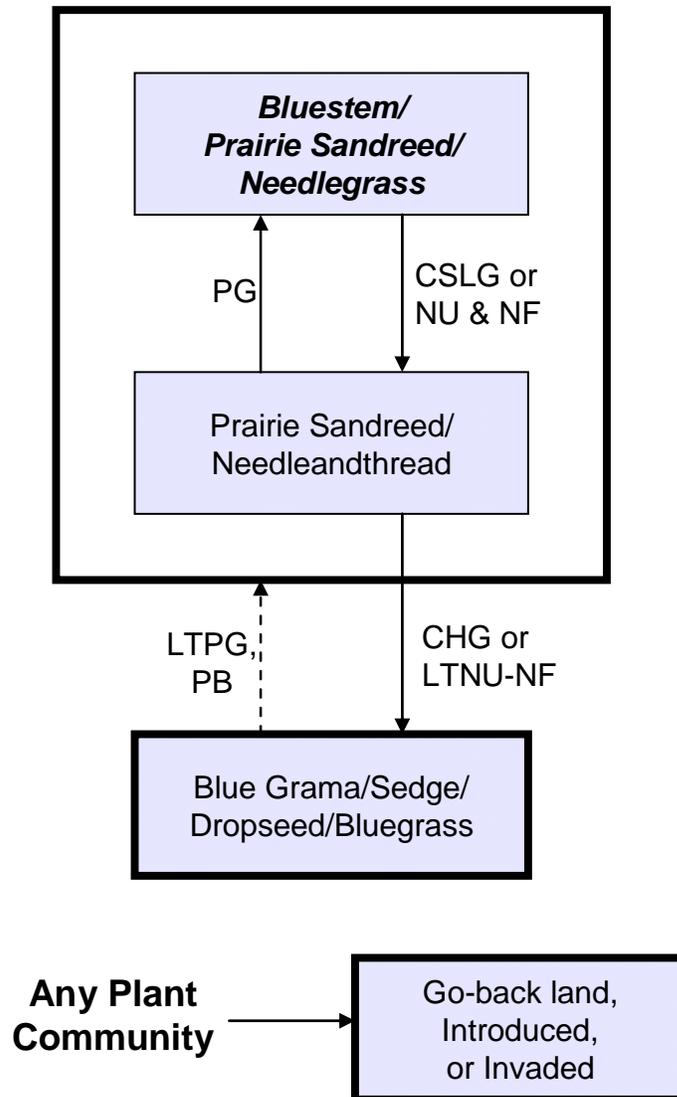
Continuous season-long grazing (during the typical growing season of May through October) and/or repeated seasonal grazing (e.g., every spring, every summer) without adequate recovery periods following each grazing occurrence, causes this site to depart from the Bluestem/Prairie Sandreed/Needlegrass Plant Community. Species such as western wheatgrass, prairie sandreed, needleandthread, prairie Junegrass, blue grama, and sedges will increase. Continued deterioration results in a community dominated by blue grama, sedge, bluegrass, sand dropseed, and western ragweed. Warm-season grasses such as sand bluestem, big bluestem, little bluestem, and eventually prairie sandreed, will decrease in frequency and production.

Interpretations are primarily based on the Bluestem/Prairie Sandreed/Needlegrass Plant Community, which is considered to be climax. 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 communities, states, transitional pathways, and thresholds have been determined through similar studies and experience.

The following diagram illustrates the common plant communities and vegetation states commonly occurring on the site and the transition pathways between communities and states. The ecological processes will be discussed in more detail in the plant community descriptions following the diagram.

Plant Communities and Transitional Pathways



CHG – Continuous heavy grazing; **CSLG** – Continuous season-long grazing; **LTNU-NF** – Long-term non-use and no fire; **LTPG** – Long-term prescribed grazing; **NU & NF** – Non-use and no fire; **PB** – Prescribed burning; **PG** – Prescribed grazing.

Plant Community Composition and Group Annual Production

| COMMON/GROUP NAME | SCIENTIFIC NAME | SYMBOL | Bluestem/Prairie Sandreed/Needlegrass | | | |
|------------------------------------|---|--------|---------------------------------------|-------------|---------|-------|
| | | | Group | lbs./acre | % Comp | |
| GRASSES & GRASS-LIKES | | | | 1920 - 2160 | 80 - 90 | |
| BLUESTEM | | | 1 | 240 - 720 | 10 - 30 | |
| big bluestem | Andropogon gerardii | ANGE | 1 | 120 - 720 | 5 - 30 | |
| sand bluestem | Andropogon hallii | ANHA | 1 | 120 - 720 | 5 - 30 | |
| TALL WARM-SEASON GRASSES | | | 2 | 360 - 600 | 15 - 25 | |
| prairie sandreed | Calamovilfa longifolia | CALO | 2 | 240 - 600 | 10 - 25 | |
| switchgrass | Panicum virgatum | PAVI2 | 2 | 120 - 240 | 5 - 10 | |
| NEEDLEGRASS | | | 3 | 240 - 480 | 10 - 20 | |
| needleandthread | Hesperostipa comata ssp. comata | HECOC8 | 3 | 240 - 480 | 10 - 20 | |
| porcupine grass | Hesperostipa spartea | HESP11 | 3 | 0 - 120 | 0 - 5 | |
| green needlegrass | Nassella viridula | NAVI4 | 3 | 0 - 120 | 0 - 5 | |
| MID WARM-SEASON GRASSES | | | 4 | 240 - 360 | 10 - 15 | |
| little bluestem | Schizachyrium scoparium | SCSC | 4 | 120 - 360 | 5 - 15 | |
| sideoats grama | Bouteloua curtipendula | BOCU | 4 | 120 - 240 | 5 - 10 | |
| SHORT WARM-SEASON GRASSES | | | 5 | 48 - 192 | 2 - 8 | |
| blue grama | Bouteloua gracilis | BOGR2 | 5 | 48 - 192 | 2 - 8 | |
| sand dropseed | Sporobolus cryptandrus | SPCR | 5 | 0 - 120 | 0 - 5 | |
| hairy grama | Bouteloua hirsuta | BOHI2 | 5 | 0 - 120 | 0 - 5 | |
| OTHER NATIVE GRASSES | | | 6 | 120 - 240 | 5 - 10 | |
| western wheatgrass | Pascopyrum smithii | PASM | 6 | 48 - 240 | 2 - 10 | |
| prairie junegrass | Koeleria macrantha | KOMA | 6 | 24 - 72 | 1 - 3 | |
| Scribner panicum | Dichanthelium oligosanthes var. scribnerianum | DIOLS | 6 | 24 - 48 | 1 - 2 | |
| other grasses | | #N/A | 6 | 0 - 120 | 0 - 5 | |
| GRASS-LIKES | | | 7 | 48 - 168 | 2 - 7 | |
| threadleaf sedge | Carex filifolia | CAFI | 7 | 48 - 168 | 2 - 7 | |
| other grass-likes | | 2GL | 7 | 0 - 120 | 0 - 5 | |
| FORBS | | | 9 | 120 - 240 | 5 - 10 | |
| annual eriogonum | Eriogonum annuum | ERAN4 | 9 | 0 - 24 | 0 - 1 | |
| annual sunflower | Helianthus annuus | HEAN3 | 9 | 0 - 48 | 0 - 2 | |
| bush morningglory | Ipomoea leptophylla | IPLE | 9 | 0 - 48 | 0 - 2 | |
| cudweed sagewort | Artemisia ludoviciana | ARLU | 9 | 24 - 48 | 1 - 2 | |
| false boneset | Brickellia eupatorioides | BREU | 9 | 24 - 72 | 1 - 3 | |
| gayfeather | Liatris spp. | LIATR | 9 | 24 - 72 | 1 - 3 | |
| goldenrod | Solidago spp. | SOLID | 9 | 24 - 48 | 1 - 2 | |
| green sagewort | Artemisia dracunculus | ARDR4 | 9 | 24 - 48 | 1 - 2 | |
| hairy goldaster | Heterotheca villosa | HEVI4 | 9 | 0 - 48 | 0 - 2 | |
| hoary puccoon | Lithospermum canescens | LICA12 | 9 | 0 - 24 | 0 - 1 | |
| penstemon | Penstemon spp. | PENST | 9 | 0 - 24 | 0 - 1 | |
| prairie clover | Dalea spp. | DALEA | 9 | 24 - 48 | 1 - 2 | |
| prairie coneflower | Ratibida columnifera | RACO3 | 9 | 24 - 48 | 1 - 2 | |
| prairie spiderwort | Tradescantia occidentalis | TROC | 9 | 24 - 48 | 1 - 2 | |
| purple coneflower | Echinacea angustifolia | ECAN2 | 9 | 0 - 48 | 0 - 2 | |
| pussytoes | Antennaria spp. | ANTEN | 9 | 0 - 24 | 0 - 1 | |
| rush skeletonweed | Lygodesmia juncea | LYJU | 9 | 0 - 24 | 0 - 1 | |
| scarlet globemallow | Sphaeralcea coccinea | SPCO | 9 | 0 - 24 | 0 - 1 | |
| scurfpea | Psoraleum spp. | PSORA2 | 9 | 24 - 48 | 1 - 2 | |
| stiff sunflower | Helianthus pauciflorus | HEPA19 | 9 | 24 - 72 | 1 - 3 | |
| western ragweed | Ambrosia psilostachya | AMPS | 9 | 0 - 24 | 0 - 1 | |
| white prairie aster | Symphotrichum falcatum | SYFA | 9 | 24 - 48 | 1 - 2 | |
| native forbs | | 2FN | 9 | 0 - 120 | 0 - 5 | |
| SHRUBS | | | 10 | 120 - 240 | 5 - 10 | |
| cactus | Opuntia spp. | OPUNT | 10 | 0 - 24 | 0 - 1 | |
| fringed sagewort | Artemisia frigida | ARFR4 | 10 | 24 - 48 | 1 - 2 | |
| leadplant | Amorpha canescens | AMCA6 | 10 | 24 - 96 | 1 - 4 | |
| rose | Rosa spp. | ROSA5 | 10 | 24 - 72 | 1 - 3 | |
| small soapweed | Yucca glauca | YUGL | 10 | 0 - 24 | 0 - 1 | |
| western sandcherry | Prunus pumila var. besseyi | PRPUB | 10 | 0 - 24 | 0 - 1 | |
| other shrubs | | 2SHRUB | 10 | 0 - 48 | 0 - 2 | |
| Annual Production lbs./acre | | | | LOW | RV | HIGH |
| GRASSES & GRASS-LIKES | | | | 1690 - | 2040 | -2450 |
| FORBS | | | | 105 - | 180 | -275 |
| SHRUBS | | | | 105 - | 180 | -275 |
| TOTAL | | | | 1900 - | 2400 | -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 Composition and Group Annual Production

| COMMON/GROUP NAME | SYMBOL | Bluestem/Prairie Sandreed/ Needlegrass | | | Prairie Sandreed/ Needleandthread | | | Blue Grama/Sedge/ Dropseed/Bluegrass | | |
|------------------------------------|--------|---|--------------------|---------|--------------------------------------|-----------|-------------------|---|-------------|---------|
| | | Grp | lbs./acre | % Comp | Grp | lbs./acre | % Comp | Grp | lbs./acre | % Comp |
| GRASSES & GRASS-LIKES | | | | | | | | | | |
| BLUESTEM | | 1 | 240 - 720 | 10 - 30 | 1 | 40 - 160 | 2 - 8 | 1 | 1190 - 1330 | 85 - 95 |
| big bluestem | ANGE | 1 | 120 - 720 | 5 - 30 | 1 | 40 - 160 | 2 - 8 | | | |
| sand bluestem | ANHA | 1 | 120 - 720 | 5 - 30 | 1 | 40 - 160 | 2 - 8 | | | |
| TALL WARM-SEASON GRASSES | | 2 | 360 - 600 | 15 - 25 | 2 | 300 - 600 | 15 - 30 | 2 | 0 - 70 | 0 - 5 |
| prairie sandreed | CALO | 2 | 240 - 600 | 10 - 25 | 2 | 300 - 600 | 15 - 30 | 2 | 0 - 70 | 0 - 5 |
| switchgrass | PAVI2 | 2 | 120 - 240 | 5 - 10 | 2 | 0 - 100 | 0 - 5 | | | |
| NEEDLEGRASS | | 3 | 240 - 480 | 10 - 20 | 3 | 300 - 500 | 15 - 25 | 3 | 28 - 140 | 2 - 10 |
| needleandthread | HECOC8 | 3 | 240 - 480 | 10 - 20 | 3 | 300 - 500 | 15 - 25 | 3 | 28 - 140 | 2 - 10 |
| porcupine grass | HESP11 | 3 | 0 - 120 | 0 - 5 | 3 | 0 - 40 | 0 - 2 | | | |
| green needlegrass | NAVI4 | 3 | 0 - 120 | 0 - 5 | 3 | 0 - 40 | 0 - 2 | | | |
| MID WARM-SEASON GRASSES | | 4 | 240 - 360 | 10 - 15 | 4 | 100 - 200 | 5 - 10 | 4 | 0 - 42 | 0 - 3 |
| little bluestem | SCSC | 4 | 120 - 360 | 5 - 15 | 4 | 40 - 160 | 2 - 8 | 4 | 0 - 42 | 0 - 3 |
| sideoats grama | BOCU | 4 | 120 - 240 | 5 - 10 | 4 | 100 - 200 | 5 - 10 | 4 | 0 - 42 | 0 - 3 |
| SHORT WARM-SEASON GRASSES | | 5 | 48 - 192 | 2 - 8 | 5 | 100 - 300 | 5 - 15 | 5 | 280 - 560 | 20 - 40 |
| blue grama | BOGR2 | 5 | 48 - 192 | 2 - 8 | 5 | 100 - 300 | 5 - 15 | 5 | 210 - 490 | 15 - 35 |
| sand dropseed | SPCR | 5 | 0 - 120 | 0 - 5 | 5 | 40 - 160 | 2 - 8 | 5 | 70 - 210 | 5 - 15 |
| hairy grama | BOHI2 | 5 | 0 - 120 | 0 - 5 | 5 | 0 - 100 | 0 - 5 | 5 | 0 - 70 | 0 - 5 |
| OTHER NATIVE GRASSES | | 6 | 120 - 240 | 5 - 10 | 6 | 100 - 200 | 5 - 10 | 6 | 28 - 112 | 2 - 8 |
| western wheatgrass | PASM | 6 | 48 - 240 | 2 - 10 | 6 | 40 - 200 | 2 - 10 | 6 | 0 - 70 | 0 - 5 |
| prairie junegrass | KOMA | 6 | 24 - 72 | 1 - 3 | 6 | 20 - 60 | 1 - 3 | 6 | 14 - 28 | 1 - 2 |
| Scribner panicum | DIOLS | 6 | 24 - 48 | 1 - 2 | 6 | 20 - 60 | 1 - 3 | 6 | 14 - 42 | 1 - 3 |
| other grasses | #N/A | 6 | 0 - 120 | 0 - 5 | 6 | 0 - 100 | 0 - 5 | 6 | 0 - 70 | 0 - 5 |
| GRASS-LIKES | | 7 | 48 - 168 | 2 - 7 | 7 | 100 - 200 | 5 - 10 | 7 | 140 - 280 | 10 - 20 |
| threadleaf sedge | CAFI | 7 | 48 - 168 | 2 - 7 | 7 | 100 - 200 | 5 - 10 | 7 | 140 - 280 | 10 - 20 |
| other grass-likes | 2GL | 7 | 0 - 120 | 0 - 5 | 7 | 0 - 100 | 0 - 5 | 7 | 0 - 140 | 0 - 10 |
| NON-NATIVE GRASSES | | 8 | | | 8 | 40 - 140 | 2 - 7 | 8 | 140 - 350 | 10 - 25 |
| bluegrass | POA | | | | 8 | 20 - 140 | 1 - 7 | 8 | 140 - 350 | 10 - 25 |
| cheatgrass | BRTE | | | | 8 | 0 - 100 | 0 - 5 | 8 | 0 - 140 | 0 - 10 |
| FORBS | | 9 | 120 - 240 | 5 - 10 | 9 | 100 - 200 | 5 - 10 | 9 | 70 - 140 | 5 - 10 |
| annual eriogonum | ERAN4 | 9 | 0 - 24 | 0 - 1 | 9 | 0 - 40 | 0 - 2 | 9 | 0 - 42 | 0 - 3 |
| annual sunflower | HEAN3 | 9 | 0 - 48 | 0 - 2 | 9 | 0 - 60 | 0 - 3 | 9 | 0 - 42 | 0 - 3 |
| bush morningglory | IPL | 9 | 0 - 48 | 0 - 2 | 9 | 0 - 20 | 0 - 1 | | | |
| cudweed sagewort | ARLU | 9 | 24 - 48 | 1 - 2 | 9 | 20 - 60 | 1 - 3 | 9 | 14 - 56 | 1 - 4 |
| false boneset | BREU | 9 | 24 - 72 | 1 - 3 | 9 | 0 - 20 | 0 - 1 | | | |
| gayfeather | LIATR | 9 | 24 - 72 | 1 - 3 | 9 | 20 - 40 | 1 - 2 | 9 | 0 - 14 | 0 - 1 |
| goldenrod | SOLID | 9 | 24 - 48 | 1 - 2 | 9 | 20 - 60 | 1 - 3 | 9 | 14 - 56 | 1 - 4 |
| green sagewort | ARDR4 | 9 | 24 - 48 | 1 - 2 | 9 | 20 - 60 | 1 - 3 | 9 | 14 - 56 | 1 - 4 |
| hairy goldaster | HEVI4 | 9 | 0 - 48 | 0 - 2 | 9 | 0 - 20 | 0 - 1 | | | |
| hoary puccoon | LICA12 | 9 | 0 - 24 | 0 - 1 | | | | | | |
| penstemon | PENST | 9 | 0 - 24 | 0 - 1 | | | | | | |
| prairie clover | DALEA | 9 | 24 - 48 | 1 - 2 | 9 | 0 - 20 | 0 - 1 | | | |
| prairie coneflower | RACO3 | 9 | 24 - 48 | 1 - 2 | 9 | 0 - 20 | 0 - 1 | 9 | 0 - 14 | 0 - 1 |
| prairie spiderwort | TROC | 9 | 24 - 48 | 1 - 2 | 9 | 0 - 20 | 0 - 1 | | | |
| purple coneflower | ECAN2 | 9 | 0 - 48 | 0 - 2 | 9 | 0 - 20 | 0 - 1 | | | |
| pussytoes | ANTEN | 9 | 0 - 24 | 0 - 1 | 9 | 0 - 20 | 0 - 1 | 9 | 0 - 14 | 0 - 1 |
| rush skeletonweed | LYJU | 9 | 0 - 24 | 0 - 1 | 9 | 0 - 20 | 0 - 1 | 9 | 0 - 14 | 0 - 1 |
| scarlet globemallow | SPCO | 9 | 0 - 24 | 0 - 1 | 9 | 0 - 20 | 0 - 1 | 9 | 0 - 14 | 0 - 1 |
| scurfpea | PSORA2 | 9 | 24 - 48 | 1 - 2 | 9 | 20 - 60 | 1 - 3 | 9 | 14 - 42 | 1 - 3 |
| stiff sunflower | HEPA19 | 9 | 24 - 72 | 1 - 3 | 9 | 0 - 20 | 0 - 1 | | | |
| western ragweed | AMPS | 9 | 0 - 24 | 0 - 1 | 9 | 20 - 60 | 1 - 3 | 9 | 14 - 70 | 1 - 5 |
| white prairie aster | SYFA | 9 | 24 - 48 | 1 - 2 | 9 | 20 - 40 | 1 - 2 | 9 | 0 - 14 | 0 - 1 |
| native forbs | 2FN | 9 | 0 - 120 | 0 - 5 | 9 | 0 - 100 | 0 - 5 | 9 | 0 - 42 | 0 - 3 |
| introduced forbs | 2FI | | | | 9 | 0 - 100 | 0 - 5 | 9 | 0 - 98 | 0 - 7 |
| SHRUBS | | 10 | 120 - 240 | 5 - 10 | 10 | 100 - 200 | 5 - 10 | 10 | 28 - 112 | 2 - 8 |
| cactus | OPUNT | 10 | 0 - 24 | 0 - 1 | 10 | 0 - 40 | 0 - 2 | 10 | 0 - 42 | 0 - 3 |
| fringed sagewort | ARFR4 | 10 | 24 - 48 | 1 - 2 | 10 | 20 - 60 | 1 - 3 | 10 | 14 - 56 | 1 - 4 |
| leadplant | AMCA6 | 10 | 24 - 96 | 1 - 4 | 10 | 0 - 20 | 0 - 1 | | | |
| rose | ROSA5 | 10 | 24 - 72 | 1 - 3 | 10 | 20 - 40 | 1 - 2 | 10 | 0 - 14 | 0 - 1 |
| small soapweed | YUGL | 10 | 0 - 24 | 0 - 1 | 10 | 0 - 40 | 0 - 2 | 10 | 0 - 42 | 0 - 3 |
| western sandcherry | PRPUB | 10 | 0 - 24 | 0 - 1 | | | | | | |
| other shrubs | 2SHRUB | 10 | 0 - 48 | 0 - 2 | 10 | 0 - 40 | 0 - 2 | 10 | 0 - 14 | 0 - 1 |
| Annual Production lbs./acre | | | LOW RV HIGH | | LOW RV HIGH | | LOW RV HIGH | | LOW RV HIGH | |
| GRASSES & GRASS-LIKES | | | 1690 - 2040 - 2450 | | 1310 - 1700 - 2050 | | 810 - 1225 - 1520 | | | |
| FORBS | | | 105 - 180 - 275 | | 95 - 150 - 225 | | 65 - 105 - 155 | | | |
| SHRUBS | | | 105 - 180 - 275 | | 95 - 150 - 225 | | 25 - 70 - 125 | | | |
| TOTAL | | | 1900 - 2400 - 3000 | | 1500 - 2000 - 2500 | | 900 - 1400 - 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 recurring 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 is collected, some of these plant communities may be revised or removed, and new ones may be added. None of these plant communities should necessarily be thought of as “Desired Plant Communities (DPC).” According to the 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.

Bluestem/Prairie Sandreed/Needlegrass Plant Community

This is the interpretive plant community and is considered to be climax. This community evolved with grazing by large herbivores and occasional prairie fire. It is well suited for grazing by domestic livestock and can be found on areas that are properly managed with prescribed grazing that allows for proper utilization, changes in season of use, and adequate recovery periods following each grazing event. The potential vegetation is about 80-90 percent grasses or grass-like plants, 5-10 percent forbs, and 5-10 percent shrubs. Dominant grasses include big or sand bluestem, prairie sandreed, little bluestem, and needleandthread. Other grasses and grass-likes include sideoats grama, western wheatgrass, and switchgrass. Significant forbs include false boneset, gayfeather, and stiff sunflower. Common shrubs include leadplant and rose.

This plant community is well adapted to the Northern Great Plains climatic conditions. Individual species can vary greatly in production depending on growing conditions (timing and amount of precipitation and temperature). Community dynamics, nutrient cycle, water cycle, and energy flow are functioning properly. Plant litter is properly distributed with little movement offsite and natural plant mortality is very low. The diversity in species allows for high drought tolerance. Runoff from adjacent sites and moderate or high available water capacity provides a favorable soil-water-plant relationship.

The following growth curve is an estimate of the monthly percentages of the annual growth of the dormant species expected during the normal year.

Growth curve number: SD6304

Growth curve name: Pierre Shale Plains, 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 | 18 | 25 | 25 | 15 | 7 | 1 | 0 | 0 |

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

- Continuous season-long grazing or nonuse and no fire will convert the plant community to the *Prairie Sandreed/Needleandthread Plant Community*.

Prairie Sandreed/Needleandthread Plant Community

This plant community developed under continuous season-long grazing or nonuse and no fire. The plant community's mid-grass component is reduced and an understory of short sod-forming grasses is increasing. Dominant grasses include needleandthread and prairie sandreed. Other grasses and grass-likes include blue grama, sideoats grama, western wheatgrass, and sedge. Forbs commonly found in this plant community include cudweed sagewort, goldenrod, green sagewort, scurfspea, and western ragweed. Shrubs in this community include rose and fringed sagewort.

When compared to the climax plant community, sand bluestem and little bluestem have decreased. Prairie sandreed is beginning to decline. Needleandthread, blue grama, and sand dropseed are increasing. Plant diversity is high but on a downward trend. This plant community is not resistant to change. Management changes can easily shift this plant community. Soil erosion is low. The water cycle is functioning, infiltration is high, and runoff is low.

The following growth curve is an estimate of the monthly percentages of the annual growth of the dormant species expected during the normal year.

Growth curve number: SD6003

Growth curve name: Pierre Shale 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 |

Transitional pathways leading to other plant communities are as follows:

- Prescribed grazing will adequate precipitation and recovery time from grazing occurrences will move this plant community toward the *Bluestem/Prairie Sandreed/Needlegrass Plant Community*.
- Continuous heavy grazing will convert the plant community to the *Blue Grama/Sedge/Dropseed/Bluegrass Plant Community*.
- Long-term nonuse and no fire for extended periods of time will convert this plant community to the *Blue Grama/Sedge/Dropseed/Bluegrass Plant Community*.

Blue Grama/Sedge/Dropseed/Bluegrass Plant Community

This plant community typically develops under continuous heavy grazing over a period of several years, or from long-term nonuse or no fire. It is made up of short, grazing tolerant species. The dominant species are blue grama, sand dropseed, threadleaf sedge, bluegrass, and needleandthread. Dominant forbs include cudweed sagewort, goldenrod, green sagewort, scurfpea, and western ragweed. Dominant shrubs are fringed sagewort and small soapweed. Compared to the climax plant community, blue grama and sand dropseed have increased creating sod bound conditions. Big bluestem and sand bluestem are absent. Prairie sandreed is limited to a few sparse colonies.

This plant community is fairly resistant to change. Soil erosion is low. The water cycle is reduced because of the lack of surface litter. Infiltration is moderate due to soil texture, which can help to reduce runoff, but offsite gully erosion can be a concern. Forage production, species diversity, and ground cover are declining.

The following growth curve is an estimate of the monthly percentages of the annual growth of the dormant species expected during the normal year.

Growth curve number: SD6303

Growth curve name: Pierre Shale 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 |

Transitional pathways leading to other plant communities are as follows:

- Long-term prescribed grazing or prescribed burning will move this plant community back towards the *Bluestem/Prairie Sandreed/Needlegrass Plant Community*. The rate of this transition can be extremely variable depending on the species present on the site and the availability of a seed source. Typically, this transition will take a long period time.

Go-back land, Introduced, or Invaded Plant Community

This group includes three separate vegetation states that are highly variable in nature. They are derived through distinct management scenarios, and are not related successional. Infiltration, runoff, and soil erosion vary depending on the vegetation present on the site.

The **Go-back State** can be reached whenever severe mechanical disturbance (i.e., abandoned farmland) occurs. During the early successional stages, the species that mainly dominate are annual grasses and forbs, later being replaced by both native and introduced perennials. The vegetation on this site varies greatly, sometimes being dominated by sand dropseed, threeawn, annual brome, crested wheatgrass, broom snakeweed, sweetclover, and nonnative thistles. Other plants that commonly occur on the site include western wheatgrass, prickly lettuce, maretail, kochia, bottlebrush squirreltail, foxtail, and annual sunflower. If remnant populations are sufficient, western wheatgrass can sometimes rapidly occupy this state.

The **Introduced State** is normally those areas seeded to crested wheatgrass, pubescent, or intermediate wheatgrass, and alfalfa. They require considerable investment to establish and have a variable life expectancy. They do produce up to 50 percent more than native range, but their value as forage is somewhat limited due to the single species usually seeded.

The **Invaded State** includes areas that have been invaded by species such as smooth brome, Kentucky bluegrass, crested wheatgrass, nonnative thistles, field bindweed, knapweeds, leafy spurge, hoary cress, and other introduced species.

Ecological Site Interpretations

Animal Community – Wildlife Interpretations

-- Under development --

Bluestem/Prairie Sandreed/Needlegrass Plant Community:

Prairie Sandreed/Needleandthread Plant Community:

Blue Grama/Sedge/Dropseed/Bluegrass Plant Community:

Go-back land, Introduced, or Invaded Plant Community:

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

| Common Name | Cattle | Sheep | Horses | Deer | Antelope | Bison | Elk |
|---------------------------------|---------|---------|---------|---------|----------|---------|---------|
| Grasses & Grass-like | | | | | | | |
| 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 |
| 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 |
| 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 |
| porcupine grass | U P U D | N D N U | U P U D | N D N U | N D N U | U P U D | U P U D |
| prairie 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 |
| sand 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 |
| 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 |
| Scribner panicum | U U D U | N U N N | U U D U | N U N N | N U N N | U U D U | U U D U |
| 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 |
| 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 |
| 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 | | | | | | | |
| annual eriogonum | 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 |
| annual sunflower | U U D U | U D U U | U U D U | U D U U | U D U U | U U D U | U D U U |
| bush morningglory | U D P U | U D D U | U D P U | U D D U | U D D U | U D P U | U D D 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 |
| 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 |
| 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 |
| goldenrod | U U D U | N U U N | U U D U | N U U N | N U U N | U U D U | N U U N |
| green sagewort | U U U U | U U U U | U U U U | U U U U | U U U U | U U U U | U U U U |
| hairy goldaster | U U D U | N N N N | U U D U | N N N N | N N N N | U U D U | N N N N |
| hoary puccoon | 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 |
| 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 |
| prairie spiderwort | 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 |
| 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 |
| pussytoes | 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 |
| rush skeletonweed | U U U U | N N N N | U U U U | N N N N | N N N N | U U U U | N N N N |
| scarlet globemallow | U U D U | U D D U | U U D U | U D D U | U D D U | U U D U | U D D U |
| 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 |
| stiff 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 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 |
| 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 | | | | | | | |
| 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 |
| small soapweed | D N N D | D U U D | D N N D | D U U D | D U U D | D N N D | D U U D |
| western sandcherry | D P P D | D U U D | D P P D | P U D P | D U U D | D P P D | P U U P |

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 ecological site 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) |
|---------------------------------------|--|---------------------------|
| Bluestem/Prairie Sandreed/Needlegrass | 2400 | 0.66 |
| Prairie Sandreed/Needleandthread | 2000 | 0.55 |
| Blue Grama/Sedge/Dropseed/Bluegrass | 1400 | 0.38 |

*Based on 912 lbs./acre (air-dry weight) per Animal Unit Month (AUM), and on 25 percent harvest efficiency (refer to USDA 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. Infiltration varies from moderate to rapid and runoff potential varies from negligible to medium for this site depending on soil hydrologic group, slope and ground cover. In many cases, areas with greater than 75 percent ground cover have the greatest potential for high infiltration and lower runoff. An exception would be where shortgrasses form a dense sod and dominate the site. Areas where ground cover is less than 50 percent have the greatest potential to have reduced infiltration and higher runoff (refer to Section 4, NRCS National Engineering Handbook for runoff quantities and hydrologic curves).

Recreational Uses

This site provides hunting, hiking, photography, bird watching, and other opportunities. The wide varieties of plants that bloom from spring until fall have an aesthetic value that appeals to visitors.

Wood Products

Timber harvest of eastern redcedar may occur on localized areas of this site.

Other Products

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

Supporting Information

Associated Sites

Loamy (R063AY010SD), Sands (R063AY008SD), Loamy Overflow (R063AY020SD).

Similar Sites

(R063AY008SD) – Sands [more sand bluestem; less western wheatgrass; steeper slopes]

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: April Boltjes, Range Management Specialist (RMS), NRCS; Stan Boltz, RMS, NRCS; Kent Cooley, Soil Scientist, NRCS; Rick Peterson, RMS, NRCS; and L. Michael Stirling, RMS, NRCS.

| <u>Data Source</u> | <u>Number of Records</u> | <u>Sample Period</u> | <u>State</u> | <u>County</u> |
|--------------------|--------------------------|----------------------|--------------|---------------|
| SCS-RANGE-417 | 0 | | | |

State Correlation

MLRA 63A lies entirely within SD, so no cross-state correlation has occurred.

Field Offices/Counties

| | | | | | |
|----------------|---------|----------------|----------|-----------------|-----------------|
| Dupree, SD | Ziebach | McIntosh, SD | Corson | Pierre, SD | Hughes/Stanley |
| Faith, SD | Meade | Mound City, SD | Campbell | Selby, SD | Walworth |
| Gettysburg, SD | Potter | Murdo, SD | Jones | Timber Lake, SD | Dewey |
| Kadoka, SD | Jackson | Onida, SD | Sully | Wall, SD | East Pennington |
| Kennebec, SD | Lyman | Philip, SD | Haakon | White River, SD | Mellette |

Relationship to Other Established Classifications

Level IV Ecoregions of the Conterminous United States: 43c – River Breaks and 43f – Subhumid Pierre Shale Plains.

Other References

High Plains Regional Climate Center, University of Nebraska, 830728 Chase Hall, Lincoln, NE 68583-0728. (<http://www.hprcc.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