

Ecological site R064XY027NE Clayey Overflow

Accessed: 05/04/2024

General information

Provisional. A provisional ecological site description has undergone quality control and quality assurance review. It contains a working state and transition model and enough information to identify the ecological site.

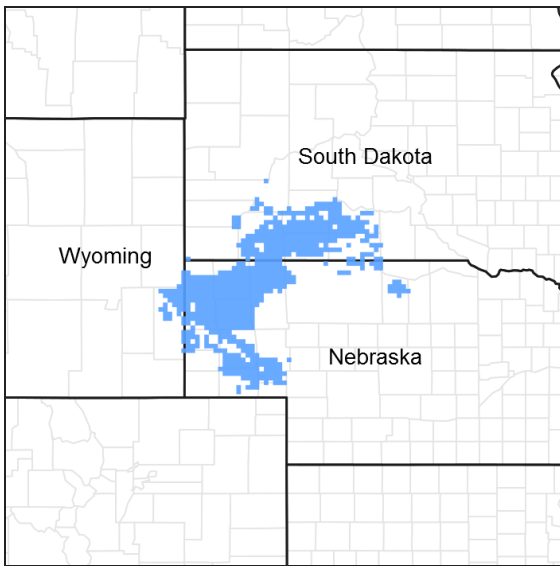


Figure 1. Mapped extent

Areas shown in blue indicate the maximum mapped extent of this ecological site. Other ecological sites likely occur within the highlighted areas. It is also possible for this ecological site to occur outside of highlighted areas if detailed soil survey has not been completed or recently updated.

Classification relationships

Level IV Ecoregions of the Conterminous United States: 25a – Pine Ridge Escarpment, 43h – White River Badlands, and 43i – Keya Paha Tablelands.

Associated sites

| | |
|-------------|-------------------------|
| R064XY014NE | Clayey 14-17" PZ |
| R064XY035NE | Clayey 17-20 PZ |
| R064XY044NE | Claypan |
| R064XY045NE | Dense Clay |

Similar sites

| | |
|-------------|---|
| R064XY026NE | Loamy Overflow [More bluestems; less western wheatgrass.] |
|-------------|---|

Table 1. Dominant plant species

| | |
|------|---------------|
| Tree | Not specified |
|------|---------------|

| | |
|------------|-------------------------------|
| Shrub | Not specified |
| Herbaceous | (1) <i>Pascopyrum smithii</i> |

Physiographic features

This site occurs on nearly level areas that receive additional water from overflow of intermittent streams or runoff from adjacent slopes.

Table 2. Representative physiographic features

| | |
|--------------------|---|
| Landforms | (1) Depression (2) Playa (3) Stream terrace |
| Flooding duration | Brief (2 to 7 days) |
| Flooding frequency | None to occasional |
| Ponding duration | Brief (2 to 7 days) |
| Ponding frequency | None to occasional |
| Elevation | 884–1,219 m |
| Slope | 0–3% |
| Ponding depth | 0–15 cm |
| Water table depth | 61–203 cm |
| Aspect | Aspect is not a significant factor |

Climatic features

MLRA 64 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 14 to 20 inches per year. The normal average annual temperature is about 47° F. January is the coldest month with average temperatures ranging from about 21° F (Wood, SD) to about 25° F (Hemingford, NE). July is the warmest month with temperatures averaging from about 70° F (Keeline 3 W, WY) to about 76° F (Wood, SD). The range of normal average monthly temperatures between the coldest and warmest months is about 55° F. This large annual range attests to the continental nature of this area's climate. Hourly winds average about 11 miles per hour annually, ranging from about 13 miles per hour during the spring to about 10 miles per hour during the summer. Daytime winds are generally stronger than nighttime and occasional strong storms may bring brief periods of high winds with gusts to more than 50 miles per hour.

Growth of 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.

Table 3. Representative climatic features

| | |
|-------------------------------|----------|
| Frost-free period (average) | 143 days |
| Freeze-free period (average) | 163 days |
| Precipitation total (average) | 508 mm |

Influencing water features

B6, C6

(Rosgen System)

Soil features

The common features of soils in this site are the clay to silty clay loam textured subsoils and slopes of 0 to 3 percent. The soils in this site are somewhat poorly to well drained and formed in alluvium. The silt loam to silty clay surface layer is 4 to 6 inches thick. The soils have a very slow to moderately slow infiltration rate. This site should show no evidence of rills, wind scoured areas or pedestalled plants. Water flow paths are broken, irregular in appearance or discontinuous with numerous debris dams or vegetative barriers. The soil surface is stable and intact.

These soils are mainly susceptible to water erosion. The hazard of water erosion increases where vegetative cover is not adequate. A drastic loss of the soil surface layer on this site can result in a shift in species composition and/or production.

More information can be found in the various soil survey reports. Contact the local USDA Service Center for soil survey reports that include more detail specific to your location.

Table 4. Representative soil features

| | |
|--|---|
| Surface texture | (1) Silt loam (2) Silty clay |
| Family particle size | (1) Clayey |
| Drainage class | Somewhat poorly drained to well drained |
| Permeability class | Very slow to moderately slow |
| Soil depth | 203 cm |
| Surface fragment cover <=3" | 0% |
| Surface fragment cover >3" | 0% |
| Available water capacity (0-101.6cm) | 15.24–17.78 cm |
| Calcium carbonate equivalent (0-101.6cm) | 0–10% |
| Electrical conductivity (0-101.6cm) | 0–4 mmhos/cm |
| Sodium adsorption ratio (0-101.6cm) | 0 |
| Soil reaction (1:1 water) (0-101.6cm) | 6.1–8.4 |
| Subsurface fragment volume <=3" (Depth not specified) | 0–10% |
| Subsurface fragment volume >3" (Depth not specified) | 0–5% |

Ecological dynamics

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 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.

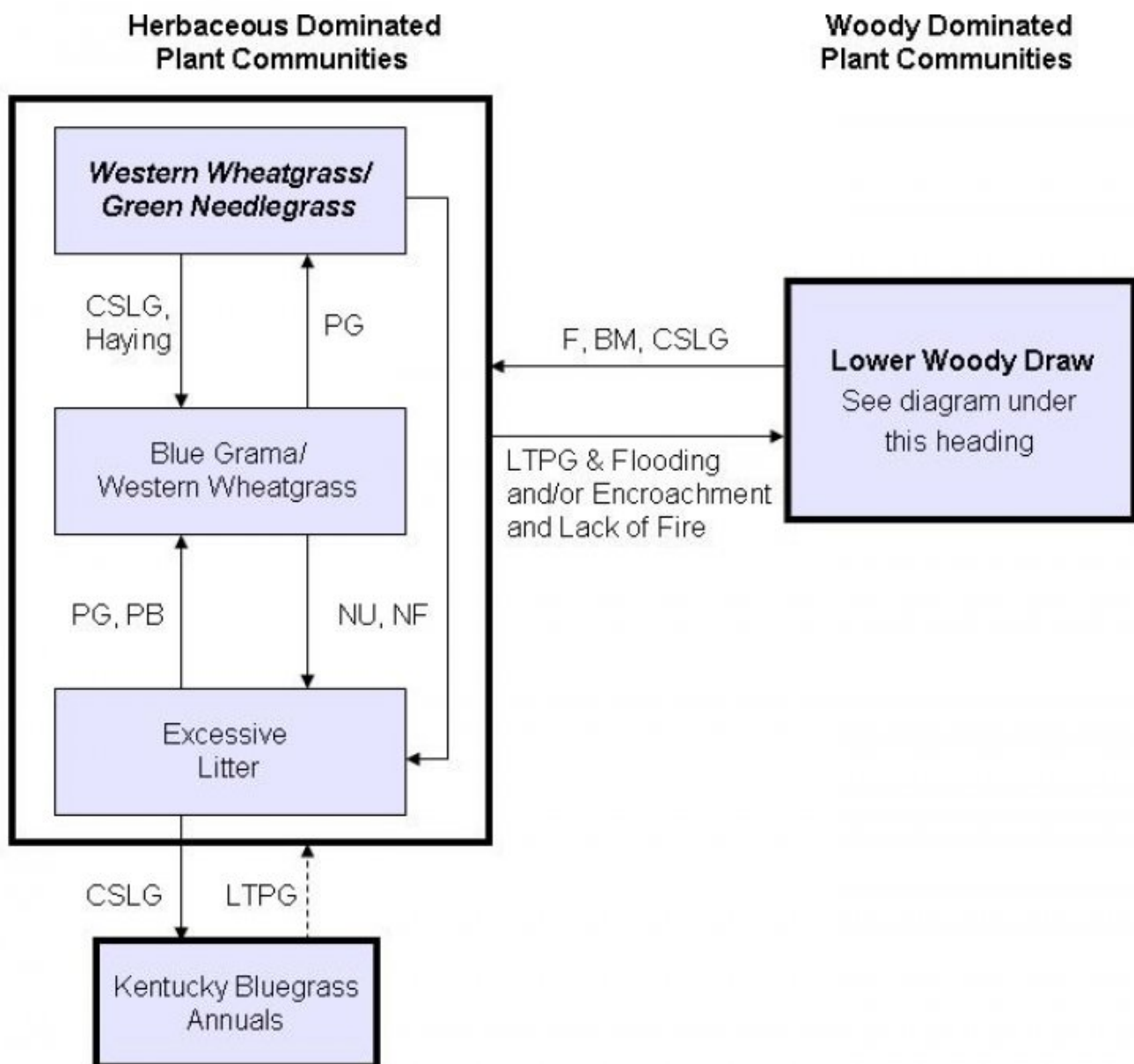
Continuous season-long grazing (during the typical growing season of May through October) and/or repeated

seasonal grazing (e.g., every spring, every summer) without adequate recovery periods following each grazing occurrence causes this site to depart from the Western Wheatgrass/Green Needlegrass Plant Community. Western wheatgrass increases initially and will eventually decrease with continuous grazing. Grasses such as green needlegrass, big bluestem and switchgrass will decrease in frequency and production. Where trees dominate the site, woody regeneration will decline and grasses and forbs will become dominant in the understory. It is thought that the climax is an herbaceous dominated site, and trees establish from the adjacent Thin Breaks site. Clayey Overflow sites occupying lower landscape positions or plant communities adjacent to riparian areas will often be dominated by a mixed hardwood overstory.

Interpretations are primarily based on the Western Wheatgrass/Green Needlegrass Plant Community. 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 is a diagram that illustrates the common plant communities that can occur on the site and the transition pathways between communities. The ecological processes will be discussed in more detail in the plant community descriptions following the diagram.

State and transition model



BM - Brush management (fire, chemical, mechanical); **CSLG** - Continuous season-long grazing (grazing a unit for an entire growing season); **F** - Fire; **LTPG** - Long-term prescribed grazing; **NF** - No fire; **NU** - Non use; **PG** - Prescribed grazing (planned, controlled harvest of vegetation with grazing or browsing animals – see FOTG, Section IV, 528).

Figure 4. Clayey Overflow

Western Wheatgrass/Green Needlegrass

Community 1.1

Western Wheatgrass/Green Needlegrass

Interpretations are based primarily on the Western Wheatgrass/Green Needlegrass Plant Community (this is also considered to be climax). Potential vegetation is about 85% grasses or grass-like plants, 10% forbs, and 5% shrubs. The plant community is dominated by cool season grasses. The major grasses include western wheatgrass and green needlegrass. Other grasses and grass-likes include switchgrass, big bluestem, blue grama, buffalograss, tall dropseed and sedges. Forbs consist of American licorice, American vetch, aster species, and goldenrod. Woody species included in the plant community are fourwing saltbush, western snowberry and rose. This plant community is productive and diverse. 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.

Table 5. Annual production by plant type

| Plant Type | Low (Kg/Hectare) | Representative Value (Kg/Hectare) | High (Kg/Hectare) |
|-----------------|---------------------|--------------------------------------|----------------------|
| Grass/Grasslike | 1412 | 2493 | 2875 |
| Forb | 135 | 211 | 308 |
| Shrub/Vine | 22 | 84 | 146 |
| Tree | – | 15 | 34 |
| Total | 1569 | 2803 | 3363 |

Figure 6. Plant community growth curve (percent production by month). NE6406, Pine Ridge/Badlands, lowland cool-season dominant. Cool-season dominant, lowland.

| Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| | | 5 | 13 | 28 | 28 | 12 | 5 | 6 | 3 | | |

State 2

Blue Grama/Western Wheatgrass

Community 2.1

Blue Grama/Western Wheatgrass

This plant community is the result of haying and/or continuous season-long grazing. Western wheatgrass has declined. Short warm season grasses such as blue grama and buffalograss dominate this plant community. These grasses can form a sod, limiting production for haying and grazing. The potential is low for any woody regeneration. This plant community is resistant to change due to grazing tolerance of blue grama and buffalograss. A significant amount of production and diversity has been lost when compared to the Western Wheatgrass/Green Needlegrass Plant Community. Loss of cool season grasses and much of the woody component have negatively impacted energy flow and nutrient cycling. Water infiltration can be reduced due to the shallow root system, characteristic of blue grama and buffalograss. Soil loss may be obvious where flow paths are connected.

Table 6. Annual production by plant type

| Plant Type | Low (Kg/Hectare) | Representative Value (Kg/Hectare) | High (Kg/Hectare) |
|-----------------|---------------------|--------------------------------------|----------------------|
| Grass/Grasslike | 813 | 1404 | 1883 |
| Forb | 73 | 118 | 163 |
| Shrub/Vine | 11 | 47 | 84 |
| Total | 897 | 1569 | 2130 |

Figure 8. Plant community growth curve (percent production by month). NE6408, Pine Ridge/Badlands, lowland cool-season/warm-season co-

dominant. Cool-season, warm-season co-dominant, lowland.

| Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| | | 5 | 12 | 20 | 25 | 19 | 11 | 5 | 3 | | |

State 3

Kentucky Bluegrass, Annuals

Community 3.1

Kentucky Bluegrass, Annuals

This plant community developed under continuous season-long grazing. It is dominated by Kentucky bluegrass, annual brome and other annual grasses and forbs. The dominant forbs include western ragweed, scurfpeas, cudweed sagewort, and verbenas. Dominant shrubs in this community include snowberry, and rose. Compared to the Western Wheatgrass/Green Needlegrass Plant Community, Kentucky bluegrass increases significantly and western wheatgrass and big bluestem decreases significantly. Plant diversity and productivity has declined. This plant community is resistant to change, and if disturbed, it is resilient. Bluegrass will increase under grazing pressure. Cool, moist climatic conditions will also tend to increase bluegrass production. Soil erosion is low. Compared to the Western Wheatgrass/Green Needlegrass Plant Community, infiltration is reduced, and runoff increases. Once this plant community is reached, time and external resources will be needed to see any immediate recovery in the diversity.

Table 7. Annual production by plant type

| Plant Type | Low (Kg/Hectare) | Representative Value (Kg/Hectare) | High (Kg/Hectare) |
|-----------------|---------------------|--------------------------------------|----------------------|
| Grass/Grasslike | 1227 | 1462 | 1777 |
| Forb | 84 | 224 | 392 |
| Shrub/Vine | 34 | 106 | 185 |
| Total | 1345 | 1792 | 2354 |

Figure 10. Plant community growth curve (percent production by month). NE6406, Pine Ridge/Badlands, lowland cool-season dominant. Cool-season dominant, lowland.

| Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| | | 5 | 13 | 28 | 28 | 12 | 5 | 6 | 3 | | |

State 4

Excessive Litter

Community 4.1

Excessive Litter

This plant community developed under extended periods of non-use and no fire. Initially, western wheatgrass can dominate this plant community, but over time, the site will likely be invaded by annual and perennial forbs, and grasses such as Kentucky bluegrass, smooth brome grass and cheatgrass. Other grasses and grass-likes may include blue grama, foxtail barley, big bluestem and threeawn. Forbs include western ragweed, scurfpeas, cudweed sagewort, and verbenas. Shrubs in this community include rose and western snowberry. With continued non-use and no fire, the plant community becomes dominated by Kentucky bluegrass, smooth brome grass, cheatgrass and typically non-native annual and perennial forbs. Warm season grasses have decreased along with production and vigor. Initially, soil erosion is low, but over time the site will become more susceptible to erosion.

Table 8. Annual production by plant type

| Plant Type | Low (Kg/Hectare) | Representative Value (Kg/Hectare) | High (Kg/Hectare) |
|-----------------|---------------------|--------------------------------------|----------------------|
| Grass/Grasslike | 1648 | 1827 | 2096 |
| Forb | 106 | 280 | 476 |
| Shrub/Vine | 39 | 135 | 230 |
| Total | 1793 | 2242 | 2802 |

Figure 12. Plant community growth curve (percent production by month). NE6406, Pine Ridge/Badlands, lowland cool-season dominant. Cool-season dominant, lowland.

| Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| | | 5 | 13 | 28 | 28 | 12 | 5 | 6 | 3 | | |

Additional community tables

Table 9. Community 1.1 plant community composition

| Group | Common Name | Symbol | Scientific Name | Annual Production (Kg/Hectare) | Foliar Cover (%) |
|------------------------|---------------------------------------|--------|---|-----------------------------------|---------------------|
| Grass/Grasslike | | | | | |
| 1 | Wheatgrass | | | 1121–1681 | |
| | western wheatgrass | PASM | <i>Pascopyrum smithii</i> | 1121–1681 | – |
| | slender wheatgrass | ELTRT | <i>Elymus trachycaulus</i> ssp. <i>trachycaulus</i> | 0–56 | – |
| 2 | Needlegrass | | | 140–420 | |
| | green needlegrass | NAVI4 | <i>Nassella viridula</i> | 140–420 | – |
| 3 | Tall Warm-Season Grasses | | | 28–140 | |
| | big bluestem | ANGE | <i>Andropogon gerardii</i> | 28–140 | – |
| | switchgrass | PAVI2 | <i>Panicum virgatum</i> | 28–140 | – |
| | prairie cordgrass | SPPE | <i>Spartina pectinata</i> | 0–56 | – |
| 4 | Short Warm-Season Grasses | | | 56–280 | |
| | blue grama | BOGR2 | <i>Bouteloua gracilis</i> | 56–280 | – |
| 5 | Native Grasses and Grass-likes | | | 140–420 | |
| | composite dropseed | SPCOC2 | <i>Sporobolus compositus</i> var. <i>compositus</i> | 84–280 | – |
| | marsh muhly | MURA | <i>Muhlenbergia racemosa</i> | 0–140 | – |
| | sedge | CAREX | <i>Carex</i> | 56–140 | – |
| | foxtail barley | HOJU | <i>Hordeum jubatum</i> | 56–140 | – |
| | Carolina scalystem | ELCA6 | <i>Elytraria caroliniensis</i> | 0–84 | – |
| | Sandberg bluegrass | POSE | <i>Poa secunda</i> | 0–84 | – |
| | Grass, perennial | 2GP | <i>Grass, perennial</i> | 0–84 | – |
| | threeawn | ARIST | <i>Aristida</i> | 0–56 | – |
| | spikerush | ELEOC | <i>Eleocharis</i> | 0–56 | – |
| | rush | JUNCU | <i>Juncus</i> | 0–56 | – |
| | prairie Junegrass | KOMA | <i>Koeleria macrantha</i> | 0–56 | – |
| Forb | | | | | |
| 7 | Forbs | | | 140–280 | |
| | American licorice | GLLE3 | <i>Glycyrrhiza lepidota</i> | 56–140 | – |

| | | | | | |
|-------------------|---------------------------------|--------|--|--------|---|
| | scurfpea | PSORA2 | <i>Psoraleidium</i> | 28–84 | – |
| | goldenrod | SOLID | <i>Solidago</i> | 28–84 | – |
| | vervain | VERBE | <i>Verbena</i> | 28–84 | – |
| | American vetch | VIAM | <i>Vicia americana</i> | 28–84 | – |
| | Forb, annual | 2FA | <i>Forb, annual</i> | 0–84 | – |
| | Forb, perennial | 2FP | <i>Forb, perennial</i> | 0–84 | – |
| | common yarrow | ACMI2 | <i>Achillea millefolium</i> | 0–84 | – |
| | white sagebrush | ARLU | <i>Artemisia ludoviciana</i> | 0–84 | – |
| | aster | ASTER | <i>Aster</i> | 28–84 | – |
| | false boneset | BREU | <i>Brickellia eupatorioides</i> | 0–84 | – |
| | scarlet beeblossom | GACO5 | <i>Gaura coccinea</i> | 28–84 | – |
| | Cuman ragweed | AMPS | <i>Ambrosia psilostachya</i> | 28–56 | – |
| | scarlet globemallow | SPCO | <i>Sphaeralcea coccinea</i> | 28–56 | – |
| | upright prairie coneflower | RACO3 | <i>Ratibida columnifera</i> | 0–56 | – |
| | starry false lily of the valley | MAST4 | <i>Maianthemum stellatum</i> | 0–28 | – |
| | pussytoes | ANTEN | <i>Antennaria</i> | 0–28 | – |
| Shrub/Vine | | | | | |
| 8 | Shrubs | | | 28–140 | |
| | silver sagebrush | ARCA13 | <i>Artemisia cana</i> | 0–140 | – |
| | rose | ROSA5 | <i>Rosa</i> | 28–84 | – |
| | Subshrub (<.5m) | 2SUBS | <i>Subshrub (<.5m)</i> | 0–84 | – |
| | western snowberry | SYOC | <i>Symphoricarpos occidentalis</i> | 28–56 | – |
| | fourwing saltbush | ATCA2 | <i>Atriplex canescens</i> | 28–56 | – |
| | broom snakeweed | GUSA2 | <i>Gutierrezia sarothrae</i> | 0–28 | – |
| | pricklypear | OPUNT | <i>Opuntia</i> | 0–28 | – |
| | American plum | PRAM | <i>Prunus americana</i> | 0–28 | – |
| | chokecherry | PRVI | <i>Prunus virginiana</i> | 0–28 | – |
| Tree | | | | | |
| 9 | Trees | | | 0–28 | |
| | Tree | 2TREE | <i>Tree</i> | 0–28 | – |
| | boxelder | ACNE2 | <i>Acer negundo</i> | 0–28 | – |
| | common hackberry | CEOC | <i>Celtis occidentalis</i> | 0–28 | – |
| | hawthorn | CRATA | <i>Crataegus</i> | 0–28 | – |
| | green ash | FRPE | <i>Fraxinus pennsylvanica</i> | 0–28 | – |
| | plains cottonwood | PODEM | <i>Populus deltoides ssp. monilifera</i> | 0–28 | – |
| | American elm | ULAM | <i>Ulmus americana</i> | 0–28 | – |

Table 10. Community 2.1 plant community composition

| Group | Common Name | Symbol | Scientific Name | Annual Production (Kg/Hectare) | Foliar Cover (%) |
|------------------------|--------------------|--------|---------------------------|--------------------------------|------------------|
| Grass/Grasslike | | | | | |
| 1 | Wheatgrass | | | 157–392 | |
| | western wheatgrass | PASM | <i>Pascopyrum smithii</i> | 157–392 | – |

| | | | | | |
|-------------------|---------------------------------------|--------|--|---------|---|
| 2 | Needlegrass | | | 0-78 | |
| | green needlegrass | NAVI4 | <i>Nassella viridula</i> | 0-78 | - |
| 3 | Tall Warm-Season Grasses | | | 0-16 | |
| | prairie cordgrass | SPPE | <i>Spartina pectinata</i> | 0-16 | - |
| 4 | Short Warm-Season Grasses | | | 392-785 | |
| | blue grama | BOGR2 | <i>Bouteloua gracilis</i> | 314-628 | - |
| 5 | Native Grasses and Grass-likes | | | 78-157 | |
| | sedge | CAREX | <i>Carex</i> | 31-110 | - |
| | foxtail barley | HOJU | <i>Hordeum jubatum</i> | 31-78 | - |
| | marsh muhly | MURA | <i>Muhlenbergia racemosa</i> | 0-78 | - |
| | composite dropseed | SPCOC2 | <i>Sporobolus compositus</i> var. <i>compositus</i> | 31-78 | - |
| | Grass, perennial | 2GP | <i>Grass, perennial</i> | 0-47 | - |
| | threeawn | ARIST | <i>Aristida</i> | 0-31 | - |
| | Sandberg bluegrass | POSE | <i>Poa secunda</i> | 0-31 | - |
| | rush | JUNCU | <i>Juncus</i> | 0-31 | - |
| | prairie Junegrass | KOMA | <i>Koeleria macrantha</i> | 0-31 | - |
| | spikerush | ELEOC | <i>Eleocharis</i> | 0-31 | - |
| 6 | Introduced Grasses | | | 16-78 | |
| | Kentucky bluegrass | POPR | <i>Poa pratensis</i> | 16-78 | - |
| | cheatgrass | BRTE | <i>Bromus tectorum</i> | 0-31 | - |
| | smooth brome | BRIN2 | <i>Bromus inermis</i> | 0-16 | - |
| Forb | | | | | |
| 7 | Forbs | | | 78-157 | |
| | vervain | VERBE | <i>Verbena</i> | 16-78 | - |
| | common mullein | VETH | <i>Verbascum thapsus</i> | 16-78 | - |
| | Cuman ragweed | AMPS | <i>Ambrosia psilostachya</i> | 47-78 | - |
| | aster | ASTER | <i>Aster</i> | 31-78 | - |
| | scarlet beeblossom | GACO5 | <i>Gaura coccinea</i> | 16-47 | - |
| | American licorice | GLLE3 | <i>Glycyrrhiza lepidota</i> | 16-47 | - |
| | scurfpea | PSORA2 | <i>Psoraleidum</i> | 16-47 | - |
| | Forb, annual | 2FA | <i>Forb, annual</i> | 0-47 | - |
| | Forb, perennial | 2FP | <i>Forb, perennial</i> | 0-47 | - |
| | common yarrow | ACMI2 | <i>Achillea millefolium</i> | 0-47 | - |
| | goldenrod | SOLID | <i>Solidago</i> | 16-47 | - |
| | white sagebrush | ARLU | <i>Artemisia ludoviciana</i> | 16-47 | - |
| | scarlet globemallow | SPCO | <i>Sphaeralcea coccinea</i> | 16-31 | - |
| | pussytoes | ANTEN | <i>Antennaria</i> | 0-31 | - |
| | burdock | ARCTI | <i>Arctium</i> | 0-31 | - |
| | upright prairie coneflower | RACO3 | <i>Ratibida columnifera</i> | 16-31 | - |
| | curly dock | RUCR | <i>Rumex crispus</i> | 0-31 | - |
| Shrub/Vine | | | | | |
| 8 | Shrubs | | | 16-78 | |

| | | | | | |
|--|-------------------|--------|------------------------------------|-------|---|
| | silver sagebrush | ARCA13 | <i>Artemisia cana</i> | 0-78 | - |
| | rose | ROSA5 | <i>Rosa</i> | 16-47 | - |
| | western snowberry | SYOC | <i>Symphoricarpos occidentalis</i> | 16-31 | - |
| | broom snakeweed | GUSA2 | <i>Gutierrezia sarothrae</i> | 16-31 | - |
| | pricklypear | OPUNT | <i>Opuntia</i> | 0-31 | - |
| | Subshrub (<.5m) | 2SUBS | <i>Subshrub (<.5m)</i> | 0-16 | - |

Table 11. Community 3.1 plant community composition

| Group | Common Name | Symbol | Scientific Name | Annual Production (Kg/Hectare) | Foliar Cover (%) |
|------------------------|---------------------------------------|--------|--|--------------------------------|------------------|
| Grass/Grasslike | | | | | |
| 1 | Wheatgrass | | | 36-179 | |
| | western wheatgrass | PASM | <i>Pascopyrum smithii</i> | 36-179 | - |
| 3 | Tall Warm-Season Grasses | | | 0-36 | |
| | big bluestem | ANGE | <i>Andropogon gerardii</i> | 0-36 | - |
| 4 | Short Warm-Season Grasses | | | 0-179 | |
| | blue grama | BOGR2 | <i>Bouteloua gracilis</i> | 0-179 | - |
| 5 | Native Grasses and Grass-likes | | | 90-269 | |
| | foxtail barley | HOJU | <i>Hordeum jubatum</i> | 36-143 | - |
| | sedge | CAREX | <i>Carex</i> | 18-90 | - |
| | Grass, perennial | 2GP | <i>Grass, perennial</i> | 0-54 | - |
| | threeawn | ARIST | <i>Aristida</i> | 0-36 | - |
| | rush | JUNCU | <i>Juncus</i> | 0-36 | - |
| | prairie Junegrass | KOMA | <i>Koeleria macrantha</i> | 0-36 | - |
| | composite dropseed | SPCOC2 | <i>Sporobolus compositus var. compositus</i> | 18-36 | - |
| | spikerush | ELEOC | <i>Eleocharis</i> | 0-18 | - |
| 6 | Introduced Grasses | | | 628-897 | |
| | Kentucky bluegrass | POPR | <i>Poa pratensis</i> | 628-897 | - |
| | smooth brome | BRIN2 | <i>Bromus inermis</i> | 36-269 | - |
| | cheatgrass | BRTE | <i>Bromus tectorum</i> | 36-179 | - |
| Forb | | | | | |
| 7 | Forbs | | | 90-359 | |
| | Cuman ragweed | AMPS | <i>Ambrosia psilostachya</i> | 92-269 | - |
| | common mullein | VETH | <i>Verbascum thapsus</i> | 18-143 | - |
| | Forb, annual | 2FA | <i>Forb, annual</i> | 36-90 | - |
| | Forb, perennial | 2FP | <i>Forb, perennial</i> | 18-90 | - |
| | common yarrow | ACMI2 | <i>Achillea millefolium</i> | 18-90 | - |
| | American licorice | GLLE3 | <i>Glycyrrhiza lepidota</i> | 0-90 | - |
| | scurfpea | PSORA2 | <i>Psoraleidium</i> | 36-90 | - |
| | curly dock | RUCR | <i>Rumex crispus</i> | 0-90 | - |
| | goldenrod | SOLID | <i>Solidago</i> | 18-90 | - |
| | white sagebrush | ARLU | <i>Artemisia ludoviciana</i> | 36-90 | - |
| | aster | ASTER | <i>Aster</i> | 36-90 | - |

| | | | | | |
|-------------------|---------------------|--------|------------------------------------|--------|---|
| | scarlet beeblossom | GACO5 | <i>Gaura coccinea</i> | 0–54 | – |
| | nettle | URTIC | <i>Urtica</i> | 0–54 | – |
| | vervain | VERBE | <i>Verbena</i> | 18–54 | – |
| | burdock | ARCTI | <i>Arctium</i> | 0–54 | – |
| | scarlet globemallow | SPCO | <i>Sphaeralcea coccinea</i> | 18–36 | – |
| Shrub/Vine | | | | | |
| 8 | Shrubs | | | 36–179 | |
| | silver sagebrush | ARCA13 | <i>Artemisia cana</i> | 18–90 | – |
| | rose | ROSA5 | <i>Rosa</i> | 18–90 | – |
| | western snowberry | SYOC | <i>Symphoricarpos occidentalis</i> | 18–90 | – |
| | broom snakeweed | GUSA2 | <i>Gutierrezia sarothrae</i> | 18–72 | – |
| | American plum | PRAM | <i>Prunus americana</i> | 18–54 | – |
| | pricklypear | OPUNT | <i>Opuntia</i> | 0–36 | – |
| | Subshrub (<.5m) | 2SUBS | <i>Subshrub (<.5m)</i> | 0–36 | – |

Table 12. Community 4.1 plant community composition

| Group | Common Name | Symbol | Scientific Name | Annual Production (Kg/Hectare) | Foliar Cover (%) |
|------------------------|---------------------------------------|--------|--|--------------------------------|------------------|
| Grass/Grasslike | | | | | |
| 1 | Wheatgrass | | | 112–448 | |
| | western wheatgrass | PASM | <i>Pascopyrum smithii</i> | 112–448 | – |
| 2 | Needlegrass | | | 45–112 | |
| | green needlegrass | NAVI4 | <i>Nassella viridula</i> | 45–112 | – |
| 3 | Tall Warm-Season Grasses | | | 112–224 | |
| | big bluestem | ANGE | <i>Andropogon gerardii</i> | 45–224 | – |
| | switchgrass | PAVI2 | <i>Panicum virgatum</i> | 22–112 | – |
| 4 | Short Warm-Season Grasses | | | 112–224 | |
| | blue grama | BOGR2 | <i>Bouteloua gracilis</i> | 45–179 | – |
| 5 | Native Grasses and Grass-likes | | | 112–336 | |
| | Grass, perennial | 2GP | <i>Grass, perennial</i> | 0–112 | – |
| | sedge | CAREX | <i>Carex</i> | 22–112 | – |
| | spikerush | ELEOC | <i>Eleocharis</i> | 0–112 | – |
| | rush | JUNCU | <i>Juncus</i> | 0–112 | – |
| | composite dropseed | SPCOC2 | <i>Sporobolus compositus var. compositus</i> | 45–112 | – |
| | Canada wildrye | ELCA4 | <i>Elymus canadensis</i> | 0–67 | – |
| | threeawn | ARIST | <i>Aristida</i> | 0–67 | – |
| | Sandberg bluegrass | POSE | <i>Poa secunda</i> | 0–45 | – |
| 6 | Introduced Grasses | | | 448–673 | |
| | Kentucky bluegrass | POPR | <i>Poa pratensis</i> | 336–560 | – |
| | cheatgrass | BRTE | <i>Bromus tectorum</i> | 45–224 | – |
| | smooth brome | BRIN2 | <i>Bromus inermis</i> | 22–112 | – |
| Forb | | | | | |
| 7 | Forbs | | | 112–448 | |

| | | | | | |
|-------------------|-------------------------------|--------|------------------------------------|--------|---|
| | common mullein | VETH | <i>Verbascum thapsus</i> | 22-224 | - |
| | Forb, annual | 2FA | <i>Forb, annual</i> | 45-224 | - |
| | white sagebrush | ARLU | <i>Artemisia ludoviciana</i> | 45-179 | - |
| | curly dock | RUCR | <i>Rumex crispus</i> | 0-179 | - |
| | goldenrod | SOLID | <i>Solidago</i> | 22-112 | - |
| | nettle | URTIC | <i>Urtica</i> | 0-112 | - |
| | Forb, perennial | 2FP | <i>Forb, perennial</i> | 45-112 | - |
| | Cuman ragweed | AMPS | <i>Ambrosia psilostachya</i> | 45-112 | - |
| | burdock | ARCTI | <i>Arctium</i> | 0-112 | - |
| | common yarrow | ACMI2 | <i>Achillea millefolium</i> | 22-67 | - |
| | aster | ASTER | <i>Aster</i> | 22-67 | - |
| | vervain | VERBE | <i>Verbena</i> | 22-67 | - |
| | American licorice | GLLE3 | <i>Glycyrrhiza lepidota</i> | 0-67 | - |
| | scurfpea | PSORA2 | <i>Psoralegium</i> | 22-67 | - |
| | upright prairie coneflower | RACO3 | <i>Ratibida columnifera</i> | 22-67 | - |
| | scarlet globemallow | SPCO | <i>Sphaeralcea coccinea</i> | 0-45 | - |
| | false boneset | BREU | <i>Brickellia eupatorioides</i> | 0-45 | - |
| | scarlet beeblossom | GACO5 | <i>Gaura coccinea</i> | 0-22 | - |
| Shrub/Vine | | | | | |
| 8 | Shrubs | | | 45-224 | |
| | western snowberry | SYOC | <i>Symphoricarpos occidentalis</i> | 45-179 | - |
| | chokecherry | PRVI | <i>Prunus virginiana</i> | 0-67 | - |
| | rose | ROSA5 | <i>Rosa</i> | 22-67 | - |
| | silver sagebrush | ARCA13 | <i>Artemisia cana</i> | 0-67 | - |
| | broom snakeweed | GUSA2 | <i>Gutierrezia sarothrae</i> | 0-45 | - |
| | American plum | PRAM | <i>Prunus americana</i> | 0-45 | - |
| | Subshrub (<.5m) | 2SUBS | <i>Subshrub (<.5m)</i> | 0-45 | - |
| | pricklypear | OPUNT | <i>Opuntia</i> | 0-22 | - |
| | fourwing saltbush | ATCA2 | <i>Atriplex canescens</i> | 0-22 | - |

Hydrological functions

Water is the principal factor limiting forage production on this site. This site is dominated by soils in hydrologic group C and D. Infiltration rate is moderately slow to slow. 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% ground cover have the greatest potential for high infiltration and lower runoff. An example of an exception would be where short-grasses form a strong sod and dominate the site. Areas where ground cover is less than 50% have the greatest potential to have reduced infiltration and higher runoff (refer to Section 4, NRCS National Engineering Handbook for runoff quantities and hydrologic curves).

Recreational uses

This site provides hunting, 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

Local or individual fire wood can be utilized from this site.

Other products

None noted.

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, NRCS; Jill Epley, Range Management Specialist, NRCS; Rick Peterson, Range Management Specialist, NRCS; David Steffen, Range Management Specialist, NRCS; Jeff Vander Wilt; Range Management Specialist, NRCS; Phil Young, Soil Scientist, NRCS.

Other references

High Plains Regional Climate Center, University of Nebraska, 830728 Chase Hall, Lincoln, NE 68583-0728. (<http://hpccsun.unl.edu>)

USDA, NRCS. National Water and Climate Center, 101 SW Main, Suite 1600, Portland, OR 97204-3224. (<http://wcc.nrcs.usda.gov>)

USDA, NRCS. National Range and Pasture Handbook, September 1997

USDA, NRCS. National Soil Information System, Information Technology Center, 2150 Centre Avenue, Building A, Fort Collins, CO 80526. (<http://nasis.nrcs.usda.gov>)

USDA, NRCS. 2001. The PLANTS Database, Version 3.1 (<http://plants.usda.gov>). National Plant Data Center, Baton Rouge, LA 70874-4490 USA.

USDA, NRCS, Various Published Soil Surveys.

Contributors

SCB

Rangeland health reference sheet

Interpreting Indicators of Rangeland Health is a qualitative assessment protocol used to determine ecosystem condition based on benchmark characteristics described in the Reference Sheet. A suite of 17 (or more) indicators are typically considered in an assessment. The ecological site(s) representative of an assessment location must be known prior to applying the protocol and must be verified based on soils and climate. Current plant community cannot be used to identify the ecological site.

| | |
|---|---|
| Author(s)/participant(s) | Stan Boltz |
| Contact for lead author | Stan Boltz, stanley.boltz@sd.usda.gov , 605-352-1236 |
| Date | 03/31/2004 |
| Approved by | Stan Boltz |
| Approval date | |
| Composition (Indicators 10 and 12) based on | Annual Production |

Indicators

1. **Number and extent of rills:** None.

2. **Presence of water flow patterns:** Typically none or barely visible. Evidence of water flow may be present after high

overland flow events or flooding from adjacent streams, but vegetation normally remains intact.

3. **Number and height of erosional pedestals or terracettes:** None.

4. **Bare ground from Ecological Site Description or other studies (rock, litter, lichen, moss, plant canopy are not bare ground):** Bare ground is typically less than 5 percent.

5. **Number of gullies and erosion associated with gullies:** None typical, however limited headcutting may form after high runoff or flooding events. Existing gullies should be stabilized with good vegetative cover.

6. **Extent of wind scoured, blowouts and/or depositional areas:** None typical, but limited deposition may occur after major runoff or flooding events.

7. **Amount of litter movement (describe size and distance expected to travel):** Litter of small and medium size classes will move after average to high rainfall events. Litter does not travel far, typically being trapped in small bunches by the extensive vegetative cover. Litter movement may be fairly extensive after major runoff or flooding events.

8. **Soil surface (top few mm) resistance to erosion (stability values are averages - most sites will show a range of values):** Soil aggregate stability ratings should typically be 5 to 6, normally 6. Surface organic matter adheres to the soil surface. Soil surface fragments will typically retain structure indefinitely when dipped in distilled water.

9. **Soil surface structure and SOM content (include type of structure and A-horizon color and thickness):** A-horizon should be 4 to 10 inches thick with mollic (dark) colors when moist. Structure typically is medium subangular blocky in the upper A-horizon.

10. **Effect of community phase composition (relative proportion of different functional groups) and spatial distribution on infiltration and runoff:** Combination of shallow and deep rooted species (mid & tall rhizomatous and tufted perennial cool- and warm-season grasses) with fine and coarse roots positively influences infiltration.

11. **Presence and thickness of compaction layer (usually none; describe soil profile features which may be mistaken for compaction on this site):** None – when dry, B horizons can be hard and appear to be compacted, but no platy structure will be present.

12. **Functional/Structural Groups (list in order of descending dominance by above-ground annual-production or live foliar cover using symbols: >>, >, = to indicate much greater than, greater than, and equal to):**

Dominant: Wheatgrass (mid, cool-season rhizomatous) >>

Sub-dominant: Mid/tall cool-season bunchgrasses >

Other: Short, warm-season grasses = forbs > tall, warm-season grasses = grass-like species = shrubs > trees

Additional: Other grasses occur in other functional groups in minor amounts.

13. **Amount of plant mortality and decadence (include which functional groups are expected to show mortality or decadence):** Very little evidence of decadence or mortality. Bunch grasses have strong, healthy centers and shrubs are vigorous.
-

14. **Average percent litter cover (%) and depth (in):** Litter cover is typically 50 to 80 percent, and depth of litter ranges from 0.25 to 0.5 inches.
-

15. **Expected annual annual-production (this is TOTAL above-ground annual-production, not just forage annual-production):** Total annual production ranges from 1,400 to 3,000 pounds/acre, with the reference values being 2,500 pounds/acre (air-dry basis).
-

16. **Potential invasive (including noxious) species (native and non-native). List species which BOTH characterize degraded states and have the potential to become a dominant or co-dominant species on the ecological site if their future establishment and growth is not actively controlled by management interventions. Species that become dominant for only one to several years (e.g., short-term response to drought or wildfire) are not invasive plants. Note that unlike other indicators, we are describing what is NOT expected in the reference state for the ecological site:** State and local noxious weeds; also Kentucky bluegrass.
-

17. **Perennial plant reproductive capability:** All species exhibit high vigor relative to climatic conditions. Do not rate based solely on seed production. Perennial grasses should have vigorous rhizomes or tillers.
-