

Ecological site R064XY012NE Sands

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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.

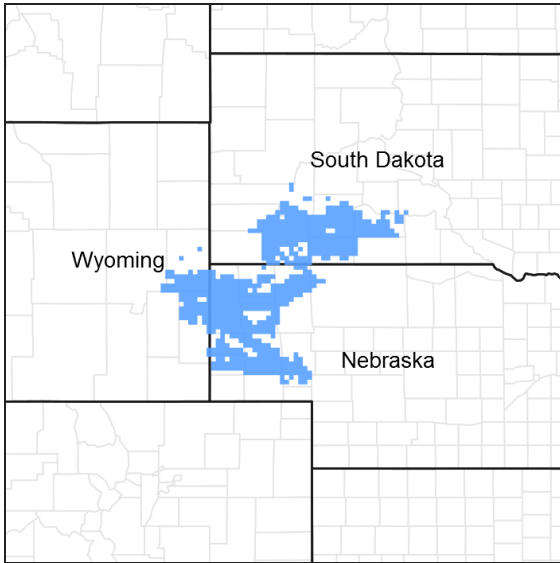


Figure 1. Mapped extent

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

R064XY011NE	Sandy 14-17" PZ
R064XY024NE	Subirrigated
R064XY032NE	Sandy 17-20" PZ

Similar sites

R064XY032NE	Sandy 17-20" PZ [More prairie sandreed; more level terrain]
R064XY011NE	Sandy 14-17" PZ [More prairie sandreed; more level terrain]

Table 1. Dominant plant species

Tree	Not specified
Shrub	Not specified
Herbaceous	(1) <i>Andropogon hallii</i> (2) <i>Calamovilfa longifolia</i>

Physiographic features

This site typically occurs on gently to more steeply sloping to rolling dunes.

Table 2. Representative physiographic features

Landforms	(1) Dune (2) Hill
Flooding frequency	None
Ponding frequency	None
Elevation	884–1,219 m
Slope	3–30%
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)	162 days
Freeze-free period (average)	140 days
Precipitation total (average)	432 mm

Influencing water features

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

Soil features

The features common to soils in this site are the loamy fine sand to sand textured surface layers and slopes of 3 to 30 percent. The soils in this site are somewhat excessively to excessively drained and formed in eolian sand or

sandy alluvium. The surface layer is 3 to 18 inches thick. The texture of the subsurface layers range from loamy fine sand to sand. This site should show slight to no evidence of rills, wind scoured areas or pedestalled plants. Water flow paths are broken, irregular in appearance or discontinuous with numerous vegetative barriers. The soil surface is stable and intact.

These soils are susceptible to wind and water erosion. The hazard of water erosion increases on slopes greater than about 15 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.

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) Loamy fine sand (2) Fine sand (3) Sand
Family particle size	(1) Sandy
Drainage class	Somewhat excessively drained to excessively drained
Permeability class	Rapid to very rapid
Soil depth	203 cm
Surface fragment cover <=3"	0%
Surface fragment cover >3"	0%
Available water capacity (0-101.6cm)	7.62–10.16 cm
Calcium carbonate equivalent (0-101.6cm)	0–10%
Electrical conductivity (0-101.6cm)	0–2 mmhos/cm
Sodium adsorption ratio (0-101.6cm)	0
Soil reaction (1:1 water) (0-101.6cm)	5.6–8.4
Subsurface fragment volume <=3" (Depth not specified)	0%
Subsurface fragment volume >3" (Depth not specified)	0%

Ecological dynamics

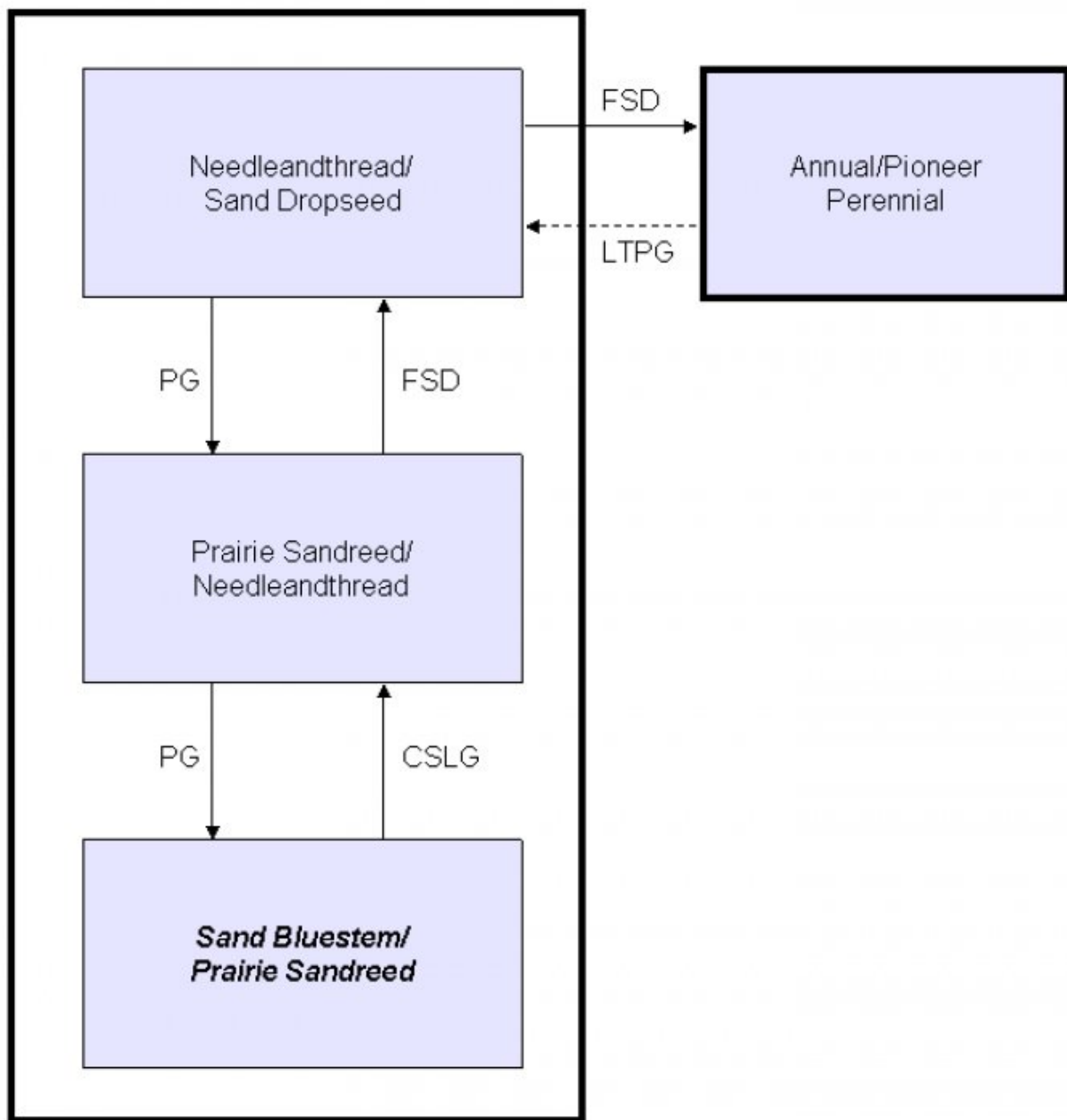
This site developed under Northern Great Plains climatic conditions, light to severe grazing by bison and other large herbivores, sporadic natural or man-caused wildfire (often of light intensities), and other biotic and abiotic factors that typically influence soil/site development. Changes will occur 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 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 Sand Bluestem/Prairie Sandreed Plant Community. Species such as sand dropseed and blue grama will increase, while sand bluestem and little bluestem will decrease. Sand sagebrush occurs primarily in the western portion of this MLRA.

Interpretations are primarily based on the Sand Bluestem/Prairie Sandreed 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 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.

State and transition model



CSLG - Continuous season-long grazing (grazing a unit for an entire growing season); **FSD** - Frequent and severe defoliation; **LTPG** - Long-term prescribed grazing; **PG** - Prescribed grazing (planned, controlled harvest of vegetation with grazing or browsing animals – see FOTG, Section IV, 528).

State 1
Reference State

Community 1.1 Sand Bluestem/Prairie Sandreed

Interpretations are based primarily on the Sand Bluestem/Prairie Sandreed Plant Community (this is also considered to be climax). This site can be found on areas that are properly managed with grazing and/or prescribed burning, and on areas receiving occasional short periods of rest. The potential vegetation is about 85% grasses or grass-like, 10% forbs, and 5% shrubs. The site is dominated by tall and mid-grasses. The major grasses include sand bluestem, prairie sandreed, little bluestem and needleandthread. Other species occurring on the site include sand dropseed, hairy grama, blue grama, switchgrass and sedge. Forbs and shrubs such as penstemon, gayfeather, rose, leadplant, and sand sagebrush are significant. This plant community is well adapted to the Northern Great Plains climatic conditions. Community dynamics, nutrient cycle, water cycle and energy flow are functioning at the sites potential. Plant litter is properly distributed with some movement off-site and natural plant mortality is low. The high plant diversity allows for high drought tolerance.

Table 5. Annual production by plant type

Plant Type	Low (Kg/Hectare)	Representative Value (Kg/Hectare)	High (Kg/Hectare)
Grass/Grasslike	1625	1938	2471
Forb	39	128	219
Shrub/Vine	17	64	112
Total	1681	2130	2802

Figure 7. Plant community growth curve (percent production by month).
NE6405, Pine Ridge/Badlands, warm-season dominant. Warm-season dominant.

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
		3	7	15	20	30	15	5	5		

Community 1.2 Prairie Sandreed/Needleandthread

This plant community typically develops under continuous season-long grazing. The plant community has a reduced component of mid-grasses with an understory of short sod-forming grasses. Dominant grasses include prairie sandreed, needleandthread, hairy grama and blue grama. Other species may include sand dropseed, and sedge. Forbs commonly found in this plant community include dotted gayfeather, cudweed sagewort, scurfpeas, and western ragweed. Shrubs in the community include small soapweed, sand sagebrush, cactus, and rose. Compared to the Sand Bluestem/Prairie Sandreed Plant Community hairy grama, blue grama, sand dropseed, and annual forbs have increased. Sand bluestem and little bluestem have decreased. Plant diversity remains high, despite the decrease in sand bluestem and little bluestem. This plant community is not resistant to change. Changes in grazing management can result in a shift to another plant community. This community is fairly resilient following normal disturbances because of the high diversity of plant species and the high amount of litter. Soil erosion is low. The water cycle is functioning due to the litter cover on the soil surface. Infiltration is high because of the soil texture and surface litter.

Table 6. Annual production by plant type

Plant Type	Low (Kg/Hectare)	Representative Value (Kg/Hectare)	High (Kg/Hectare)
Grass/Grasslike	841	1381	1580
Shrub/Vine	28	94	163
Forb	28	94	163
Total	897	1569	1906

Figure 9. Plant community growth curve (percent production by month).
NE6404, Pine Ridge/Badlands, warm-season dominant, cool-season sub-

dominant. Warm-season dominant, cool-season sub-dominant.

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
		5	8	15	24	23	15	5	5		

Community 1.3

Needleandthread/Sand Dropseed

This plant community typically develops over a period of several years, under frequent and severe defoliation during the warm-season grass growing period. The dominant grasses are needleandthread, sand dropseed, hairy grama and blue grama. Significant forbs include western ragweed, annual sunflower, tenpetal mentzelia, and annual eriogonum. Dominant shrubs in this community include sand sagebrush, small soapweed and cactus. Compared to the Sand Bluestem/Prairie Sandreed Plant Community, sand dropseed, sandhill muhly, blue grama, and hairy grama have greatly increased. Needleandthread and prairie sandreed are limited to areas in the sagebrush. Sand bluestem and little bluestem are absent. Desirable plant species have decreased. This plant community is not resistant to change due to the higher percentage of bare ground and increased sand sagebrush component. The water cycle is impaired due to a reduction in litter and the potential for higher runoff and decreased infiltration. The risk for soil erosion increases.

Table 7. Annual production by plant type

Plant Type	Low (Kg/Hectare)	Representative Value (Kg/Hectare)	High (Kg/Hectare)
Grass/Grasslike	600	843	1082
Shrub/Vine	28	90	157
Forb	45	76	106
Total	673	1009	1345

Figure 11. Plant community growth curve (percent production by month). NE6404, Pine Ridge/Badlands, warm-season dominant, cool-season sub-dominant. Warm-season dominant, cool-season sub-dominant.

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
		5	8	15	24	23	15	5	5		

State 2

Early Seral State

Community 2.1

Annual/Pioneer Perennial

This plant community develops under frequent and severe defoliation and/or excessive disturbance. This can result from heavy livestock or wildlife concentration (i.e. water locations, bedding or loafing grounds, feeding areas, etc.) or cropping abandonment (go-back land). The dominant vegetation includes pioneer annual grasses and forbs and early successional biennial and perennial species. Grasses may include blue grama, sand dropseed, sedge, sixweeks fescue, and cheatgrass. The dominant forbs may include green sagewort, western ragweed, annual sunflower, and annual eriogonum. Shrubs that may be present include cactus, small soapweed and sand sagebrush. This plant community is resistant to change, as long as soil disturbance or severe vegetation defoliation persist, thus holding back secondary plant succession. Soil erosion is potentially high in this plant community. The community also is susceptible to invasion of non-native annual and perennial forbs due to severe soil disturbances and relatively high percent of bare ground. Reduced surface cover, low plant density, low plant vigor and loss of root biomass, all contribute to decreased water infiltration, increased runoff, and accelerated erosion rates. If left without management blowouts may occur. Significant economic inputs and time would be required to move this plant community toward a higher successional stage and a more productive plant community. Secondary succession is highly variable, depending upon availability and diversity of a viable seed bank of higher successional species within the existing plant community and neighboring plant communities. This plant community can be renovated to improve the production capability, but management changes would be needed to maintain the new

plant community.

Table 8. Annual production by plant type

Plant Type	Low (Kg/Hectare)	Representative Value (Kg/Hectare)	High (Kg/Hectare)
Grass/Grasslike	291	435	577
Forb	22	69	118
Shrub/Vine	22	56	90
Total	335	560	785

Figure 13. Plant community growth curve (percent production by month).
NE6403, Pine Ridge/Badlands, cool-season/warm-season co-dominant.
Cool-season, warm-season co-dominant.

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
		5	10	20	25	20	10	5	5		

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	Sand Bluestem			319–532	
	sand bluestem	ANHA	<i>Andropogon hallii</i>	319–532	–
2	Prairie Sandreed			319–852	
	prairie sandreed	CALO	<i>Calamovilfa longifolia</i>	319–852	–
3	Little Bluestem			0–319	
	little bluestem	SCSC	<i>Schizachyrium scoparium</i>	0–319	–
4	Needleandthread			106–213	
	needle and thread	HECOC8	<i>Hesperostipa comata ssp. comata</i>	106–213	–
5	Short Warm-Season			43–213	
	blue grama	BOGR2	<i>Bouteloua gracilis</i>	21–213	–
	hairy grama	BOHI2	<i>Bouteloua hirsuta</i>	21–106	–
6	Other Native Grasses			106–319	
	sedge	CAREX	<i>Carex</i>	21–213	–
	sand dropseed	SPCR	<i>Sporobolus cryptandrus</i>	0–213	–
	threeawn	ARIST	<i>Aristida</i>	0–106	–
	switchgrass	PAVI2	<i>Panicum virgatum</i>	0–106	–
	sandhill muhly	MUPU2	<i>Muhlenbergia pungens</i>	0–106	–
	Scribner's rosette grass	DIOLS	<i>Dichanthelium oligosanthes var. scribnerianum</i>	0–43	–
	sand lovegrass	ERTR3	<i>Eragrostis trichodes</i>	0–43	–
	Indian ricegrass	ACHY	<i>Achnatherum hymenoides</i>	0–43	–
	western wheatgrass	PASM	<i>Pascopyrum smithii</i>	0–28	–
	thin paspalum	PASE5	<i>Paspalum setaceum</i>	0–21	–
Forb					
8	Forbs			43–213	
	Forb perennial	2EP	<i>Forb perennial</i>	0–43	–

	Cuman ragweed	AMPS	<i>Ambrosia psilostachya</i>	0–21	–
	tarragon	ARDR4	<i>Artemisia dracunculus</i>	0–21	–
	white sagebrush	ARLU	<i>Artemisia ludoviciana</i>	0–21	–
	false boneset	BREU	<i>Brickellia eupatorioides</i>	0–21	–
	thistle	CIRSI	<i>Cirsium</i>	0–21	–
	common sunflower	HEAN3	<i>Helianthus annuus</i>	0–21	–
	blazing star	LIATR	<i>Liatris</i>	0–21	–
	lacy tansyaster	MAPI	<i>Machaeranthera pinnatifida</i>	0–21	–
	tenpetal blazingstar	MEDE2	<i>Mentzelia decapetala</i>	0–21	–
	beardtongue	PENST	<i>Penstemon</i>	0–21	–
	scurfpea	PSORA2	<i>Psoralegium</i>	0–21	–
	goldenrod	SOLID	<i>Solidago</i>	0–21	–
	white heath aster	SYER	<i>Symphotrichum ericoides</i>	0–21	–
	spiderwort	TRADE	<i>Tradescantia</i>	0–21	–

Shrub/Vine

9	Shrubs			21–106	
	leadplant	AMCA6	<i>Amorpha canescens</i>	0–21	–
	sand sagebrush	ARFI2	<i>Artemisia filifolia</i>	0–21	–
	prairie sagewort	ARFR4	<i>Artemisia frigida</i>	0–21	–
	pricklypear	OPUNT	<i>Opuntia</i>	0–21	–
	sandcherry	PRPU3	<i>Prunus pumila</i>	0–21	–
	rose	ROSA5	<i>Rosa</i>	0–21	–
	western poison ivy	TORY	<i>Toxicodendron rydbergii</i>	0–21	–
	soapweed yucca	YUGL	<i>Yucca glauca</i>	0–21	–

Table 10. Community 1.2 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production (Kg/Hectare)	Foliar Cover (%)
Grass/Grasslike					
1	Sand Bluestem			16–157	
	sand bluestem	ANHA	<i>Andropogon hallii</i>	16–157	–
2	Prairie Sandreed			235–471	
	prairie sandreed	CALO	<i>Calamovilfa longifolia</i>	235–471	–
3	Little Bluestem			0–78	
	little bluestem	SCSC	<i>Schizachyrium scoparium</i>	0–78	–
4	Needleandthread			78–235	
	needle and thread	HECOC8	<i>Hesperostipa comata ssp. comata</i>	78–235	–
5	Short Warm-Season			78–235	
	blue grama	BOGR2	<i>Bouteloua gracilis</i>	16–235	–
	hairy grama	BOHI2	<i>Bouteloua hirsuta</i>	16–78	–
6	Other Native Grasses			78–235	
	sedge	CAREX	<i>Carex</i>	16–157	–
	sand dropseed	SPCR	<i>Sporobolus cryptandrus</i>	16–157	–
	western wheatgrass	PASM	<i>Pascopyrum smithii</i>	0–78	–

	threeawn	ARIST	<i>Aristida</i>	0–78	–
	sandhill muhly	MUPU2	<i>Muhlenbergia pungens</i>	0–78	–
	Scribner's rosette grass	DIOLS	<i>Dichantherium oligosanthes</i> var. <i>scribnerianum</i>	0–31	–
	switchgrass	PAVI2	<i>Panicum virgatum</i>	0–31	–
	sand lovegrass	ERTR3	<i>Eragrostis trichodes</i>	0–16	–
	thin paspalum	PASE5	<i>Paspalum setaceum</i>	0–16	–
	Indian ricegrass	ACHY	<i>Achnatherum hymenoides</i>	0–16	–
7	Non-Native Grasses			0–78	
	cheatgrass	BRTE	<i>Bromus tectorum</i>	0–78	–
Forb					
8	Forbs			31–157	
	Forb, perennial	2FP	<i>Forb, perennial</i>	0–31	–
	Cuman ragweed	AMPS	<i>Ambrosia psilostachya</i>	0–16	–
	tarragon	ARDR4	<i>Artemisia dracunculus</i>	0–16	–
	white sagebrush	ARLU	<i>Artemisia ludoviciana</i>	0–16	–
	false boneset	BREU	<i>Brickellia eupatorioides</i>	0–16	–
	thistle	CIRSI	<i>Cirsium</i>	0–16	–
	common sunflower	HEAN3	<i>Helianthus annuus</i>	0–16	–
	blazing star	LIATR	<i>Liatris</i>	0–16	–
	lacy tansyaster	MAPI	<i>Machaeranthera pinnatifida</i>	0–16	–
	tenpetal blazingstar	MEDE2	<i>Mentzelia decapetala</i>	0–16	–
	beardtongue	PENST	<i>Penstemon</i>	0–16	–
	scurfpea	PSORA2	<i>Psoraleidium</i>	0–16	–
	goldenrod	SOLID	<i>Solidago</i>	0–16	–
	white heath aster	SYER	<i>Symphyotrichum ericoides</i>	0–16	–
	spiderwort	TRADE	<i>Tradescantia</i>	0–16	–
Shrub/Vine					
9	Shrubs			31–157	
	sand sagebrush	ARFI2	<i>Artemisia filifolia</i>	0–78	–
	prairie sagewort	ARFR4	<i>Artemisia frigida</i>	0–31	–
	pricklypear	OPUNT	<i>Opuntia</i>	0–31	–
	soapweed yucca	YUGL	<i>Yucca glauca</i>	0–31	–
	sandcherry	PRPU3	<i>Prunus pumila</i>	0–16	–
	rose	ROSA5	<i>Rosa</i>	0–16	–
	western poison ivy	TORY	<i>Toxicodendron rydbergii</i>	0–16	–
	leadplant	AMCA6	<i>Amorpha canescens</i>	0–16	–

Table 11. Community 1.3 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production (Kg/Hectare)	Foliar Cover (%)
Grass/Grasslike					
2	Prairie Sandreed			0–101	
	prairie sandreed	CALO	<i>Calamovilfa longifolia</i>	0–101	–
4	Needleandthread			101–202	
	needle and thread	HECOC8	<i>Hesperostipa comata ssp. comata</i>	101–202	–
5	Short Warm-Season			101–303	
	blue grama	BOGR2	<i>Bouteloua gracilis</i>	101–303	–
	hairy grama	BOHI2	<i>Bouteloua hirsuta</i>	0–50	–
6	Other Native Grasses			50–202	
	sand dropseed	SPCR	<i>Sporobolus cryptandrus</i>	10–151	–
	sedge	CAREX	<i>Carex</i>	50–101	–
	threeawn	ARIST	<i>Aristida</i>	0–50	–
	western wheatgrass	PASM	<i>Pascopyrum smithii</i>	0–22	–
7	Non-Native Grasses			0–50	
	cheatgrass	BRTE	<i>Bromus tectorum</i>	0–50	–
Forb					
8	Forbs			50–101	
	scurfpea	PSORA2	<i>Psoraleidium</i>	0–20	–
	Forb, perennial	2FP	<i>Forb, perennial</i>	0–20	–
	Cuman ragweed	AMPS	<i>Ambrosia psilostachya</i>	0–20	–
	annual buckwheat	ERAN4	<i>Eriogonum annuum</i>	0–20	–
	common sunflower	HEAN3	<i>Helianthus annuus</i>	0–20	–
	blazing star	LIATR	<i>Liatris</i>	0–10	–
	lacy tansyaster	MAPI	<i>Machaeranthera pinnatifida</i>	0–10	–
	tenpetal blazingstar	MEDE2	<i>Mentzelia decapetala</i>	0–10	–
	beardtongue	PENST	<i>Penstemon</i>	0–10	–
	tarragon	ARDR4	<i>Artemisia dracunculus</i>	0–10	–
	white sagebrush	ARLU	<i>Artemisia ludoviciana</i>	0–10	–
	false boneset	BREU	<i>Brickellia eupatorioides</i>	0–10	–
	thistle	CIRSI	<i>Cirsium</i>	0–10	–
	goldenrod	SOLID	<i>Solidago</i>	0–10	–
	white heath aster	SYER	<i>Symphotrichum ericoides</i>	0–10	–
	spiderwort	TRADE	<i>Tradescantia</i>	0–10	–
Shrub/Vine					
9	Shrubs			30–151	
	sand sagebrush	ARFI2	<i>Artemisia filifolia</i>	0–101	–
	prairie sagewort	ARFR4	<i>Artemisia frigida</i>	0–50	–
	pricklypear	OPUNT	<i>Opuntia</i>	0–50	–
	soapweed yucca	YUGL	<i>Yucca glauca</i>	0–50	–
	sandcherry	PRPU3	<i>Prunus pumila</i>	0–10	–
	western poison ivy	TORY	<i>Toxicodendron rydbergii</i>	0–10	–
	leadplant	AMCA6	<i>Amorpha canescens</i>	0–10	–

Table 12. Community 2.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production (Kg/Hectare)	Foliar Cover (%)
Grass/Grasslike					
2	Prairie Sandreed			0–56	
	prairie sandreed	CALO	<i>Calamovilfa longifolia</i>	0–56	–
4	Needleandthread			56–112	
	needle and thread	HECOC8	<i>Hesperostipa comata ssp. comata</i>	56–112	–
5	Short Warm-Season			56–168	
	blue grama	BOGR2	<i>Bouteloua gracilis</i>	56–168	–
	hairy grama	BOHI2	<i>Bouteloua hirsuta</i>	0–28	–
6	Other Native Grasses			28–112	
	sand dropseed	SPCR	<i>Sporobolus cryptandrus</i>	6–84	–
	sedge	CAREX	<i>Carex</i>	28–56	–
	threeawn	ARIST	<i>Aristida</i>	0–28	–
7	Non-Native Grasses			0–56	
	cheatgrass	BRTE	<i>Bromus tectorum</i>	0–56	–
Forb					
8	Forbs			28–112	
	common sunflower	HEAN3	<i>Helianthus annuus</i>	0–84	–
	Cuman ragweed	AMPS	<i>Ambrosia psilostachya</i>	0–56	–
	white sagebrush	ARLU	<i>Artemisia ludoviciana</i>	0–28	–
	annual buckwheat	ERAN4	<i>Eriogonum annuum</i>	0–17	–
	Forb, perennial	2FP	<i>Forb, perennial</i>	0–11	–
	false boneset	BREU	<i>Brickellia eupatorioides</i>	0–6	–
	thistle	CIRSI	<i>Cirsium</i>	0–6	–
	tarragon	ARDR4	<i>Artemisia dracunculus</i>	0–6	–
	blazing star	LIATR	<i>Liatris</i>	0–6	–
	lacy tansyaster	MAPI	<i>Machaeranthera pinnatifida</i>	0–6	–
	tenpetal blazingstar	MEDE2	<i>Mentzelia decapetala</i>	0–6	–
	beardtongue	PENST	<i>Penstemon</i>	0–6	–
	scurfpea	PSORA2	<i>Psoralegium</i>	0–6	–
	goldenrod	SOLID	<i>Solidago</i>	0–6	–
	white heath aster	SYER	<i>Symphotrichum ericoides</i>	0–6	–
	spiderwort	TRADE	<i>Tradescantia</i>	0–6	–
Shrub/Vine					
9	Shrubs			28–84	
	sand sagebrush	ARFI2	<i>Artemisia filifolia</i>	0–56	–
	prairie sagewort	ARFR4	<i>Artemisia frigida</i>	0–28	–
	pricklypear	OPUNT	<i>Opuntia</i>	0–28	–
	soapweed yucca	YUGL	<i>Yucca glauca</i>	0–28	–
	rose	ROSA5	<i>Rosa</i>	0–6	–
	western poison ivy	TORY	<i>Toxicodendron rydbergii</i>	0–6	–

Hydrological functions

Water is the principal factor limiting forage production on this site. This site is dominated by soils in hydrologic group A. Infiltration ranges from high to very high. Runoff potential for this site varies from very low to low 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 detailed information).

Recreational uses

This site provides hunting opportunities for upland game species. The wide variety of plants which bloom from spring until fall have an esthetic value that appeals to visitors.

Wood products

No appreciable wood products are present on the site.

Other products

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

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

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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.

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Date	01/05/2010
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:** None.

3. **Number and height of erosional pedestals or terracettes:** Bunchgrasses may be pedestalled, but no exposed roots should be present.

4. **Bare ground from Ecological Site Description or other studies (rock, litter, lichen, moss, plant canopy are not bare ground):** Bare ground typically less than 15 percent. Occasional small blowouts may occur immediately adjacent to areas receiving repeated disturbance, but areas should be few and typically not greater than a few feet in diameter.

5. **Number of gullies and erosion associated with gullies:** Active gullies should not be present.

6. **Extent of wind scoured, blowouts and/or depositional areas:** Occasional areas associated with increased animal activity (e.g., rodent burrows, animal trailing) may exhibit small wind scoured areas, typically less than 10 feet in diameter.

7. **Amount of litter movement (describe size and distance expected to travel):** Litter should fall in place. Slight amount of movement of smallest size class litter is possible, but not normal.

8. **Soil surface (top few mm) resistance to erosion (stability values are averages - most sites will show a range of values):** Some series on this site typically have little organic matter in the surface horizon, and the structure is single grain sand. Soil aggregate stability will be difficult to measure on these soils. Surface organic matter should still adhere to the soil surface. Surface erosion by water rarely occurs due to rapid infiltration, but surface is susceptible to wind erosion if vegetative cover is reduced due to drought or heavy grazing. Biological crusts are often present (up to 10% of the surface) and serve to provide resistance to erosion. The dominant rhizomatous warm-season species are adapted to these coarse soils and when vigorous are vital in preventing erosion by wind.

9. **Soil surface structure and SOM content (include type of structure and A-horizon color and thickness):** A-horizon should be 2 to 4 inches thick. Some soils have little organic matter in the A-horizon and dark grayish brown colors when

moist, but possibly not mollic. Structure can be single grain to fine granular parting to single grain in the 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. Infiltration is typically high due to the coarse nature of these soils.
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11. **Presence and thickness of compaction layer (usually none; describe soil profile features which may be mistaken for compaction on this site):** No compaction layer should be present.
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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: Tall, warm-season grasses >>
- Sub-dominant: Mid, warm-season grasses > needlegrasses (mid, cool-season bunch) >
- Other: Short, warm-season grasses = forbs = grass-like species > shrubs
- Additional: Other native grasses occur in other functional groups in minor amounts.
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13. **Amount of plant mortality and decadence (include which functional groups are expected to show mortality or decadence):** Very little to no evidence of decadence or mortality.
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14. **Average percent litter cover (%) and depth (in):** 40-60 percent plant litter cover, roughly 0.25 to 0.5 inches in depth. Litter cover is in contact with the soil surface.
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15. **Expected annual annual-production (this is TOTAL above-ground annual-production, not just forage annual-production):** Total annual production ranges from 1,500 to 2,500 pounds/acre, with the reference value being 1,900 pounds/acre (air-dry basis).
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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:** Refer to State and local Noxious Weed List.
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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.
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