

Ecological site R064XY032NE Sandy 17-20" PZ

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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.

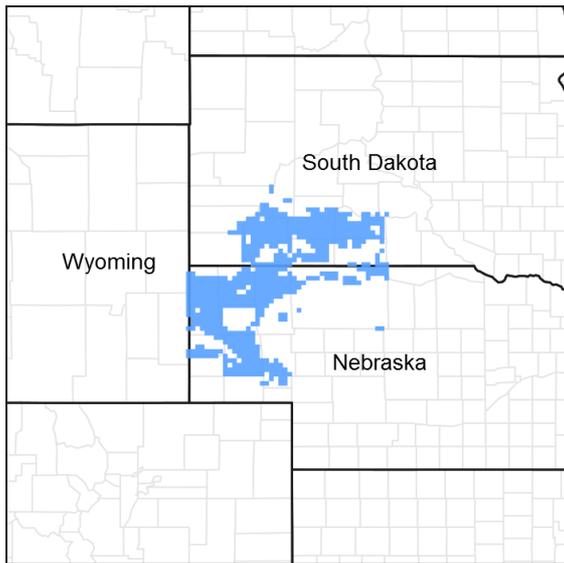


Figure 1. Mapped extent

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

R064XY012NE	Sands
R064XY024NE	Subirrigated
GX064X01X036	Loamy 17-20" PZ
R064XY040NE	Shallow

Similar sites

R064XY012NE	Sands [More sand bluestem; no western wheatgrass; less blue grama.]
GX064X01X036	Loamy 17-20" PZ [Less bluestem; more western wheatgrass.]

Table 1. Dominant plant species

Tree	Not specified
Shrub	Not specified
Herbaceous	(1) <i>Hesperostipa comata</i> ssp. <i>comata</i> (2) <i>Andropogon hallii</i>

Physiographic features

This site occurs on nearly level to steeply sloping hillslopes, terraces and alluvial fans.

Table 2. Representative physiographic features

Landforms	(1) Hill (2) Stream terrace (3) Alluvial fan
Flooding frequency	None
Ponding frequency	None
Elevation	2,900–4,000 ft
Slope	0–30%
Water table depth	80 in
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 17 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 72° F (Hemingford, NE) 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 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.

Table 3. Representative climatic features

Frost-free period (average)	143 days
Freeze-free period (average)	163 days
Precipitation total (average)	20 in

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 very fine sand to very fine sandy loam textured surface layers and slopes of 0 to 30 percent. The soils in this site are well to somewhat excessively drained and formed in eolian deposits, alluvium, colluvium or residuum. The surface layer is 3 to 30 inches thick. The texture of the subsurface generally ranges from loam to fine 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 debris dams or vegetative barriers. The soil surface is stable and intact. Sub-surface soil layers are not restrictive to water movement and root penetration.

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) Fine sandy loam (2) Very fine sandy loam (3) Loamy very fine sand
Drainage class	Well drained to somewhat excessively drained
Permeability class	Moderate to rapid
Soil depth	20–80 in
Surface fragment cover ≤3"	0%
Surface fragment cover >3"	0%
Available water capacity (0-40in)	3–7 in
Calcium carbonate equivalent (0-40in)	0–10%
Electrical conductivity (0-40in)	0–2 mmhos/cm
Sodium adsorption ratio (0-40in)	0–9
Soil reaction (1:1 water) (0-40in)	5.6–8.4
Subsurface fragment volume ≤3" (Depth not specified)	0%
Subsurface fragment volume >3" (Depth not specified)	0–10%

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. Natural fire played a significant role in the maintenance of this site by limiting conifer establishment. The recent control of fire and the increased seed source from shelterbelts result in occasional juniper and/or ponderosa pine encroachment.

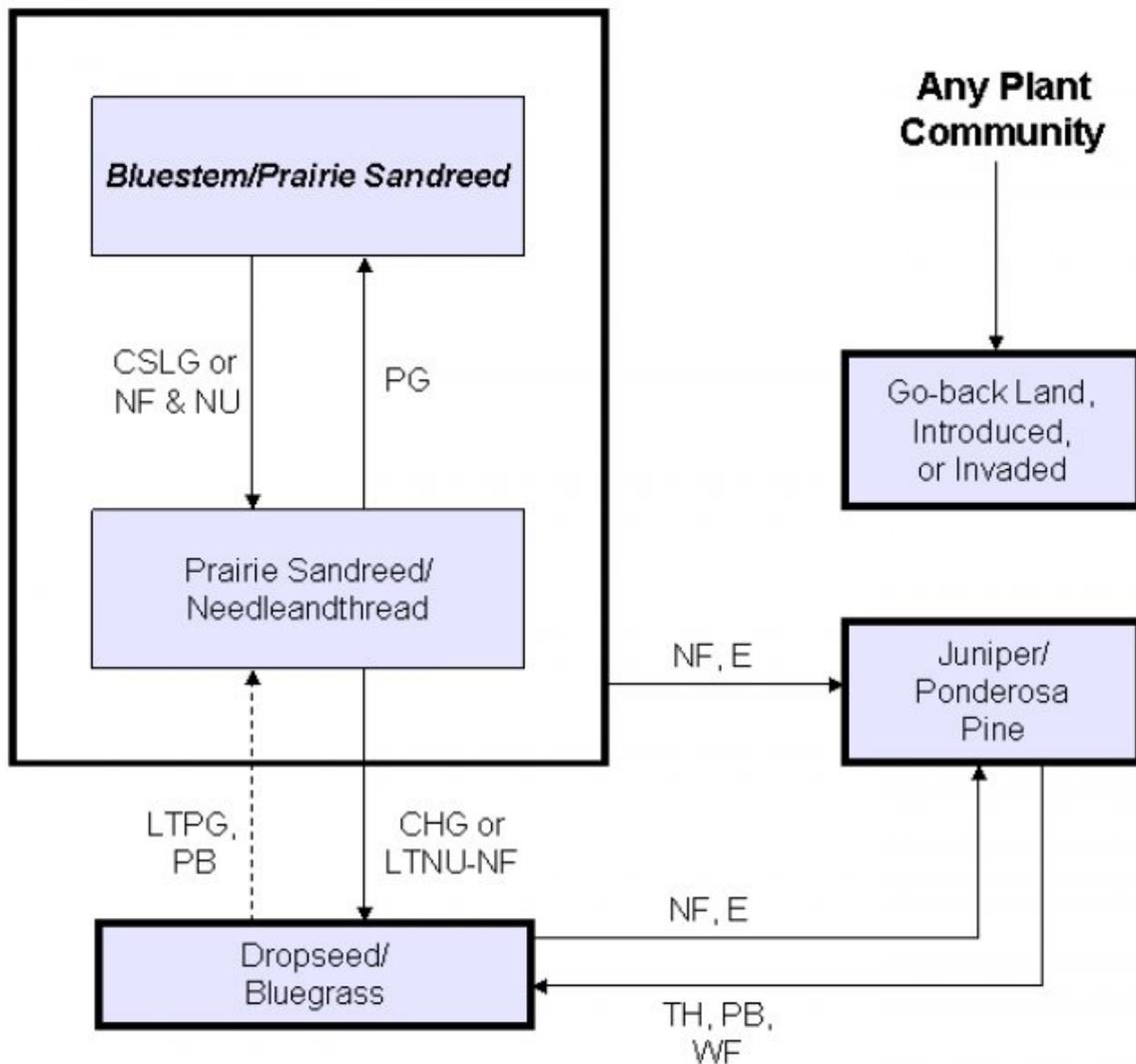
Continuous season-long grazing (during the typical growing season of May through October) and/or repeated seasonal grazing (e.g., every spring, every summer) without adequate recovery periods following each grazing occurrence causes this site to depart from the Bluestem/Prairie Sandreed Plant Community. Species such as

western wheatgrass, prairie sandreed, needleandthread, prairie junegrass, Scribner's panicum, and sedges will increase. Continued deterioration results in a community dominated by bluegrass, cheatgrass, Scribner's panicum, 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 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



CHG-Continuous heavy grazing (heavy levels of grazing of a unit during most or all of the growing season); **CSLG**-Continuous season-long grazing (grazing a unit for an entire growing season); **E**-Encroachment; **LTPG**-Long term prescribed grazing; **NF**-No fire; **NU**-Non use; **PB**-Prescribed burning; **PG**-Prescribed grazing (planned, controlled harvest of vegetation with grazing or browsing animals – see FOTG, Section IV, 528); **TH**-Timber harvest; **WF**-Wildfire.

Community 1.1 Juniper/Ponderosa Pine

Historically, ponderosa pine and juniper were confined to ridges and steep shallow slopes located adjacent to this ecological site. Ponderosa pine and juniper are expanding on to this ecological site due to the suppression of fire, and the available seed source from wildlife plantings and shelterbelts. Juniper/pine canopy cover consists of more than 10% of mature trees, but total canopy cover can be considerably higher. The understory production is made up of about 70% grass and grass-like species, 10% forbs and 20% shrubs. Dominant grasses include needleandthread, blue grama, sand dropseed and western wheatgrass. Some grasses of secondary importance include Canada wildrye and threadleaf sedge. This plant community can be changed easily in the early stages of encroachment. The invading trees can be removed with a prescribed fire followed by prescribed grazing. If the encroachment is allowed to continue without managing the invading trees, and the mature tree canopy cover becomes high enough, the plant community will become resistant to change. The herbaceous vegetation in the understory is capable of enduring fire; however, very hot crown fires will have a detrimental effect to the plant community. Reclamation of juniper/pine dominated areas can be costly and prove to be temporary without proper management (i.e. prescribed burning and prescribed grazing).

Table 5. Annual production by plant type

Plant Type	Low (Lb/Acre)	Representative Value (Lb/Acre)	High (Lb/Acre)
Grass/Grasslike	380	630	1080
Shrub/Vine	40	112	185
Tree	40	90	140
Forb	40	68	95
Total	500	900	1500

Figure 5. Plant community growth curve (percent production by month). NE6411, Pine Ridge/Badlands, heavy conifer canopy. Mature ponderosa pine/juniper overstory.

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1	3	7	10	20	28	15	5	4	4	2	1

State 2 Prairie Sandreed/Needleandthread

Community 2.1 Prairie Sandreed/Needleandthread

This plant community is resilient and develops from continuous season-long grazing. The more palatable bluestems have decreased while prairie sandreed, western wheatgrass, and needleandthread have increased. Forbs and shrubs do not change significantly in composition compared to the Bluestem/Prairie Sandreed Plant Community. This plant community maintains diversity, but production levels are lower. With non-use by herbivores and no fire, litter can accumulate and the production will eventually be reduced. Initially, the composition will not change. However, with long term non-use and no fire, this plant community can deteriorate and be susceptible to non-native plant invasion.

Table 6. Annual production by plant type

Plant Type	Low (Lb/Acre)	Representative Value (Lb/Acre)	High (Lb/Acre)
Grass/Grasslike	1470	1730	1985
Shrub/Vine	15	110	205
Forb	15	110	205
Tree	0	50	105
Total	1500	2000	2500

Figure 7. 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 3 Dropseed/Bluegrass

Community 3.1 Dropseed/Bluegrass

This plant community developed under continuous heavy grazing over a period of years, or from long-term non-use by herbivores and no fire. The grasses in this plant community consist of sand dropseed, bluegrass, Scribners panicum, sedge and blue grama. Green sagewort, western ragweed and other less palatable forbs will begin to increase in this plant community, especially with above average precipitation. Native annuals and non-native species such as sixweeks fescue and annual brome will begin to increase and/or invade on this plant community. Prairie sandreed and needleandthread can still be found, but in lesser amounts. If these remnants are virtually eliminated through excessive disturbance, it may become difficult to return to the Prairie Sandreed/Needleandthread Plant Community.

Table 7. Annual production by plant type

Plant Type	Low (Lb/Acre)	Representative Value (Lb/Acre)	High (Lb/Acre)
Grass/Grasslike	825	113	1280
Forb	65	175	300
Shrub/Vine	10	77	145
Tree	0	35	75
Total	900	400	1800

Figure 9. 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		

State 4 Bluestem/Prairie Sandreed

Community 4.1 Bluestem/Prairie Sandreed

Historically, ponderosa pine and juniper were confined to ridges and steep shallow slopes located adjacent to this ecological site. Ponderosa pine and juniper are expanding on to this ecological site due to the suppression of fire,

and the available seed source from wildlife plantings and shelterbelts. Juniper/pine canopy cover consists of more than 10% of mature trees, but total canopy cover can be considerably higher. The understory production is made up of about 70% grass and grass-like species, 10% forbs and 20% shrubs. Dominant grasses include needleandthread, blue grama, sand dropseed and western wheatgrass. Some grasses of secondary importance include Canada wildrye and threadleaf sedge. This plant community can be changed easily in the early stages of encroachment. The invading trees can be removed with a prescribed fire followed by prescribed grazing. If the encroachment is allowed to continue without managing the invading trees, and the mature tree canopy cover becomes high enough, the plant community will become resistant to change. The herbaceous vegetation in the understory is capable of enduring fire; however, very hot crown fires will have a detrimental effect to the plant community. Reclamation of juniper/pine dominated areas can be costly and prove to be temporary without proper management (i.e. prescribed burning and prescribed grazing).

Table 8. Annual production by plant type

Plant Type	Low (Lb/Acre)	Representative Value (Lb/Acre)	High (Lb/Acre)
Grass/Grasslike	1640	2016	2375
Shrub/Vine	45	144	250
Forb	115	180	250
Tree	0	60	125
Total	1800	2400	3000

Figure 11. 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		

Additional community tables

Table 9. Community 1.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production (Lb/Acre)	Foliar Cover (%)
Grass/Grasslike					
1	Bluestem			0–45	
	big bluestem	ANGE	<i>Andropogon gerardii</i>	0–45	–
	sand bluestem	ANHA	<i>Andropogon hallii</i>	0–45	–
2				45–90	
	little bluestem	SCSC	<i>Schizachyrium scoparium</i>	45–90	–
	prairie sandreed	CALO	<i>Calamovilfa longifolia</i>	0–18	–
3	Needlegrass			90–180	
	needle and thread	HECOC8	<i>Hesperostipa comata ssp. comata</i>	90–135	–
	green needlegrass	NAVI4	<i>Nassella viridula</i>	45–90	–
4	Grama			45–90	
	blue grama	BOGR2	<i>Bouteloua gracilis</i>	45–90	–
	hairy grama	BOHI2	<i>Bouteloua hirsuta</i>	45–90	–
5	Native Grasses and Grass-likes			45–225	
	western wheatgrass	PASM	<i>Pascopyrum smithii</i>	18–90	–
	sedge	CAREX	<i>Carex</i>	18–72	–
	Canada wildrye	ELCA4	<i>Elymus canadensis</i>	0–45	–
	prairie Junegrass	KOMA	<i>Koeleria macrantha</i>	9–45	–

	Grass, perennial	2GP	<i>Grass, perennial</i>	0–45	–
	sideoats grama	BOCU	<i>Bouteloua curtipendula</i>	9–45	–
	switchgrass	PAVI2	<i>Panicum virgatum</i>	0–45	–
	sixweeks fescue	VUOC	<i>Vulpia octoflora</i>	9–18	–
	Scribner's rosette grass	DIOLS	<i>Dichanthelium oligosanthes</i> var. <i>scribnerianum</i>	0–9	–
6	Non-Native Grasses			9–90	
	cheatgrass	BRTE	<i>Bromus tectorum</i>	0–45	–
	bluegrass	POA	<i>Poa</i>	9–45	–
Forb					
7	Forbs			45–90	
	Forb, annual	2FA	<i>Forb, annual</i>	0–45	–
	Forb, perennial	2FP	<i>Forb, perennial</i>	0–27	–
	pussytoes	ANTEN	<i>Antennaria</i>	0–27	–
	tarragon	ARDR4	<i>Artemisia dracunculus</i>	9–27	–
	hairy false goldenaster	HEVI4	<i>Heterotheca villosa</i>	9–27	–
	vervain	VERBE	<i>Verbena</i>	9–27	–
	goldenrod	SOLID	<i>Solidago</i>	9–27	–
	white heath aster	SYER	<i>Symphotrichum ericoides</i>	9–18	–
	spiderwort	TRADE	<i>Tradescantia</i>	0–18	–
	common mullein	VETH	<i>Verbascum thapsus</i>	9–18	–
	annual buckwheat	ERAN4	<i>Eriogonum annuum</i>	0–18	–
	lupine	LUPIN	<i>Lupinus</i>	0–18	–
	Cuman ragweed	AMPS	<i>Ambrosia psilostachya</i>	0–18	–
	thistle	CIRSI	<i>Cirsium</i>	0–18	–
	upright prairie coneflower	RACO3	<i>Ratibida columnifera</i>	9–18	–
	prairie clover	DALEA	<i>Dalea</i>	0–9	–
	blacksamson echinacea	ECAN2	<i>Echinacea angustifolia</i>	0–9	–
	white sagebrush	ARLU	<i>Artemisia ludoviciana</i>	0–9	–
	false boneset	BREU	<i>Brickellia eupatorioides</i>	0–9	–
	rush skeletonplant	LYJU	<i>Lygodesmia juncea</i>	0–9	–
	sweetclover	MELIL	<i>Melilotus</i>	0–9	–
	beardtongue	PENST	<i>Penstemon</i>	0–9	–
	scurfpea	PSORA2	<i>Psoralegium</i>	0–9	–
	common sunflower	HEAN3	<i>Helianthus annuus</i>	0–9	–
	blazing star	LIATR	<i>Liatris</i>	0–9	–
	scarlet globemallow	SPCO	<i>Sphaeralcea coccinea</i>	0–9	–
Shrub/Vine					
8	Shrubs			45–180	
	skunkbush sumac	RHTR	<i>Rhus trilobata</i>	9–63	–
	rose	ROSA5	<i>Rosa</i>	9–45	–
	western poison ivy	TORY	<i>Toxicodendron rydbergii</i>	18–45	–
	skunkbush (2.5m)	ROSA5	skunkbush (2.5m)	9–45	–

	Substrud (<.5m)	Subs	Substrud (<.5m)	U-45	-
	leadplant	AMCA6	<i>Amorpha canescens</i>	9-45	-
	prairie sagewort	ARFR4	<i>Artemisia frigida</i>	0-27	-
	soapweed yucca	YUGL	<i>Yucca glauca</i>	0-27	-
	currant	RIBES	<i>Ribes</i>	0-27	-
	pricklypear	OPUNT	<i>Opuntia</i>	9-27	-
	western sandcherry	PRPUB	<i>Prunus pumila var. besseyi</i>	0-9	-
	broom snakeweed	GUSA2	<i>Gutierrezia sarothrae</i>	0-9	-
Tree					
9	Trees			45-135	
	juniper	JUNIP	<i>Juniperus</i>	45-135	-
	ponderosa pine	PIPO	<i>Pinus ponderosa</i>	45-135	-

Table 10. Community 2.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production (Lb/Acre)	Foliar Cover (%)
Grass/Grasslike					
1	Bluestem			40-200	
	big bluestem	ANGE	<i>Andropogon gerardii</i>	40-200	-
	sand bluestem	ANHA	<i>Andropogon hallii</i>	40-200	-
2				400-800	
	prairie sandreed	CALO	<i>Calamovilfa longifolia</i>	300-700	-
	little bluestem	SCSC	<i>Schizachyrium scoparium</i>	40-200	-
3	Needlegrass			300-600	
	needle and thread	HECOC8	<i>Hesperostipa comata ssp. comata</i>	300-600	-
	green needlegrass	NAVI4	<i>Nassella viridula</i>	0-100	-
4	Grama			100-400	
	blue grama	BOGR2	<i>Bouteloua gracilis</i>	100-400	-
	hairy grama	BOHI2	<i>Bouteloua hirsuta</i>	0-100	-
5	Native Grasses and Grass-likes			300-600	
	western wheatgrass	PASM	<i>Pascopyrum smithii</i>	100-300	-
	sedge	CAREX	<i>Carex</i>	100-200	-
	Scribner's rosette grass	DIOLS	<i>Dichanthelium oligosanthes var. scribnerianum</i>	100-200	-
	sand dropseed	SPCR	<i>Sporobolus cryptandrus</i>	40-200	-
	prairie Junegrass	KOMA	<i>Koeleria macrantha</i>	20-100	-
	switchgrass	PAVI2	<i>Panicum virgatum</i>	0-100	-
	sideoats grama	BOCU	<i>Bouteloua curtipendula</i>	0-40	-
Forb					
7	Forbs			20-200	
	Cuman ragweed	AMPS	<i>Ambrosia psilostachya</i>	40-100	-
	tarragon	ARDR4	<i>Artemisia dracuncululus</i>	20-100	-
	white sagebrush	ARLU	<i>Artemisia ludoviciana</i>	20-60	-
	bush morning-glory	IPLA	<i>Ipomoea leptophylla</i>	20-60	-
	scurfpea	PSORA2	<i>Psoralea</i>	20-60	-

	upright prairie coneflower	RACO3	<i>Ratibida columnifera</i>	20–40	–
	white heath aster	SYER	<i>Symphotrichum ericoides</i>	20–40	–
	annual buckwheat	ERAN4	<i>Eriogonum annuum</i>	20–40	–
	lupine	LUPIN	<i>Lupinus</i>	20–40	–
	Forb, perennial	2FP	<i>Forb, perennial</i>	0–40	–
	hairy false goldenaster	HEVI4	<i>Heterotheca villosa</i>	20–40	–
	Forb, annual	2FA	<i>Forb, annual</i>	0–20	–
	pussytoes	ANTEN	<i>Antennaria</i>	0–20	–
	false boneset	BREU	<i>Brickellia eupatorioides</i>	0–20	–
	thistle	CIRSI	<i>Cirsium</i>	0–20	–
	Texas croton	CRTE4	<i>Croton texensis</i>	0–20	–
	prairie clover	DALEA	<i>Dalea</i>	0–20	–
	blacksamson echinacea	ECAN2	<i>Echinacea angustifolia</i>	0–20	–
	rush skeletonplant	LYJU	<i>Lygodesmia juncea</i>	0–20	–
	sweetclover	MELIL	<i>Melilotus</i>	0–20	–
	beardtongue	PENST	<i>Penstemon</i>	0–20	–
	common sunflower	HEAN3	<i>Helianthus annuus</i>	0–20	–
	stiff sunflower	HEPA19	<i>Helianthus pauciflorus</i>	0–20	–
	blazing star	LIATR	<i>Liatris</i>	0–20	–
	hoary puccoon	LICA12	<i>Lithospermum canescens</i>	0–20	–
	spiderwort	TRADE	<i>Tradescantia</i>	0–20	–
	vervain	VERBE	<i>Verbena</i>	0–20	–
	common mullein	VETH	<i>Verbascum thapsus</i>	0–20	–
	goldenrod	SOLID	<i>Solidago</i>	0–20	–
	scarlet globemallow	SPCO	<i>Sphaeralcea coccinea</i>	0–20	–
Shrub/Vine					
8	Shrubs			20–200	
	rose	ROSA5	<i>Rosa</i>	20–100	–
	leadplant	AMCA6	<i>Amorpha canescens</i>	20–100	–
	prairie sagewort	ARFR4	<i>Artemisia frigida</i>	0–40	–
	pricklypear	OPUNT	<i>Opuntia</i>	0–40	–
	Subshrub (<.5m)	2SUBS	<i>Subshrub (<.5m)</i>	0–40	–
	soapweed yucca	YUGL	<i>Yucca glauca</i>	20–40	–
Tree					
9	Trees			0–100	
	ponderosa pine	PIPO	<i>Pinus ponderosa</i>	0–100	–
	juniper	JUNIP	<i>Juniperus</i>	0–20	–

Table 11. Community 3.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production (Lb/Acre)	Foliar Cover (%)
Grass/Grasslike					
1	Bluestem			0–28	

	big bluestem	ANGE	<i>Andropogon gerardii</i>	0–28	–
	sand bluestem	ANHA	<i>Andropogon hallii</i>	0–28	–
2				28–140	
	prairie sandreed	CALO	<i>Calamovilfa longifolia</i>	28–140	–
	little bluestem	SCSC	<i>Schizachyrium scoparium</i>	0–28	–
3	Needlegrass			28–70	
	needle and thread	HECOC8	<i>Hesperostipa comata ssp. comata</i>	28–70	–
4	Grama			70–350	
	blue grama	BOGR2	<i>Bouteloua gracilis</i>	70–350	–
	hairy grama	BOHI2	<i>Bouteloua hirsuta</i>	0–70	–
5	Native Grasses and Grass-likes			350–630	
	sand dropseed	SPCR	<i>Sporobolus cryptandrus</i>	140–420	–
	Scribner's rosette grass	DIOLS	<i>Dichantherium oligosanthes var. scribnerianum</i>	140–280	–
	sedge	CAREX	<i>Carex</i>	70–210	–
	prairie Junegrass	KOMA	<i>Koeleria macrantha</i>	70–140	–
	western wheatgrass	PASM	<i>Pascopyrum smithii</i>	0–140	–
	sixweeks fescue	VUOC	<i>Vulpia octoflora</i>	14–42	–
	switchgrass	PAVI2	<i>Panicum virgatum</i>	0–28	–
	Grass, perennial	2GP	<i>Grass, perennial</i>	0–28	–
	sideoats grama	BOCU	<i>Bouteloua curtipendula</i>	0–28	–
6	Non-Native Grasses			140–420	
	bluegrass	POA	<i>Poa</i>	140–420	–
	cheatgrass	BRTE	<i>Bromus tectorum</i>	0–70	–
Forb					
7	Forbs			70–280	
	Cuman ragweed	AMPS	<i>Ambrosia psilostachya</i>	70–210	–
	tarragon	ARDR4	<i>Artemisia dracuncululus</i>	28–210	–
	Forb, annual	2FA	<i>Forb, annual</i>	0–70	–
	white sagebrush	ARLU	<i>Artemisia ludoviciana</i>	14–42	–
	hairy false goldenaster	HEVI4	<i>Heterotheca villosa</i>	14–42	–
	sweetclover	MELIL	<i>Melilotus</i>	0–42	–
	white heath aster	SYER	<i>Symphotrichum ericoides</i>	14–42	–
	vervain	VERBE	<i>Verbena</i>	14–42	–
	common mullein	VETH	<i>Verbascum thapsus</i>	0–28	–
	bush morning-glory	IPLE	<i>Ipomoea leptophylla</i>	0–28	–
	annual buckwheat	ERAN4	<i>Eriogonum annuum</i>	14–28	–
	common sunflower	HEAN3	<i>Helianthus annuus</i>	0–28	–
	lupine	LUPIN	<i>Lupinus</i>	14–28	–
	rush skeletonplant	LYJU	<i>Lygodesmia juncea</i>	0–28	–
	thistle	CIRSI	<i>Cirsium</i>	0–28	–
	Forb, perennial	2FP	<i>Forb, perennial</i>	0–28	–
	pussytoes	ANTEN	<i>Antennaria</i>	0–28	–
	Rocky Mountain heenlant	CLSE	<i>Cleome serrulata</i>	0–14	–

	Texas croton	CRTE4	<i>Croton texensis</i>	0–14	–
	blacksamson echinacea	ECAN2	<i>Echinacea angustifolia</i>	0–14	–
	blazing star	LIATR	<i>Liatris</i>	0–14	–
	hoary puccoon	LICA12	<i>Lithospermum canescens</i>	0–14	–
	spiderwort	TRADE	<i>Tradescantia</i>	0–14	–
	beardtongue	PENST	<i>Penstemon</i>	0–14	–
	scurfpea	PSORA2	<i>Psoralegium</i>	0–14	–
	upright prairie coneflower	RACO3	<i>Ratibida columnifera</i>	0–14	–
	goldenrod	SOLID	<i>Solidago</i>	0–14	–
	scarlet globemallow	SPCO	<i>Sphaeralcea coccinea</i>	0–14	–
Shrub/Vine					
8	Shrubs			14–140	
	prairie sagewort	ARFR4	<i>Artemisia frigida</i>	0–70	–
	pricklypear	OPUNT	<i>Opuntia</i>	14–70	–
	soapweed yucca	YUGL	<i>Yucca glauca</i>	14–42	–
	rose	ROSA5	<i>Rosa</i>	0–28	–
	broom snakeweed	GUSA2	<i>Gutierrezia sarothrae</i>	0–28	–
	Subshrub (<.5m)	2SUBS	<i>Subshrub (<.5m)</i>	0–28	–
	leadplant	AMCA6	<i>Amorpha canescens</i>	0–28	–
Tree					
9	Trees			0–70	
	ponderosa pine	PIPO	<i>Pinus ponderosa</i>	0–70	–
	juniper	JUNIP	<i>Juniperus</i>	0–14	–

Table 12. Community 4.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production (Lb/Acre)	Foliar Cover (%)
Grass/Grasslike					
1	Bluestem			240–720	
	big bluestem	ANGE	<i>Andropogon gerardii</i>	240–720	–
	sand bluestem	ANHA	<i>Andropogon hallii</i>	240–720	–
2				240–720	
	prairie sandreed	CALO	<i>Calamovilfa longifolia</i>	240–720	–
	little bluestem	SCSC	<i>Schizachyrium scoparium</i>	240–720	–
3	Needlegrass			360–600	
	needle and thread	HECOC8	<i>Hesperostipa comata ssp. comata</i>	360–600	–
	green needlegrass	NAVI4	<i>Nassella viridula</i>	0–120	–
4	Grama			120–360	
	blue grama	BOGR2	<i>Bouteloua gracilis</i>	120–360	–
	hairy grama	BOHI2	<i>Bouteloua hirsuta</i>	0–120	–
5	Native Grasses and Grass-likes			240–600	
	western wheatgrass	PASM	<i>Pascopyrum smithii</i>	120–240	–
	switchgrass	PAVI2	<i>Panicum virgatum</i>	120–240	–

	sideoats grama	BOCU	<i>Bouteloua curtipendula</i>	48–168	–
	Scribner's rosette grass	DIOLS	<i>Dichantherium oligosanthes</i> var. <i>scribnerianum</i>	24–120	–
	sand dropseed	SPCR	<i>Sporobolus cryptandrus</i>	24–120	–
	prairie Junegrass	KOMA	<i>Koeleria macrantha</i>	24–72	–
	sedge	CAREX	<i>Carex</i>	24–72	–
	Grass, perennial	2GP	<i>Grass, perennial</i>	24–72	–

Forb

7	Forbs			120–240	
	scurfpea	PSORA2	<i>Psoralea</i>	24–72	–
	upright prairie coneflower	RACO3	<i>Ratibida columnifera</i>	24–48	–
	white sagebrush	ARLU	<i>Artemisia ludoviciana</i>	24–48	–
	Forb, perennial	2FP	<i>Forb, perennial</i>	0–48	–
	Cuman ragweed	AMPS	<i>Ambrosia psilostachya</i>	0–48	–
	bush morning-glory	IPLE	<i>Ipomoea leptophylla</i>	24–48	–
	lupine	LUPIN	<i>Lupinus</i>	24–48	–
	rush skeletonplant	LYJU	<i>Lygodesmia juncea</i>	0–24	–
	beardtongue	PENST	<i>Penstemon</i>	0–24	–
	blazing star	LIATR	<i>Liatris</i>	0–24	–
	hoary puccoon	LICA12	<i>Lithospermum canescens</i>	0–24	–
	pussytoes	ANTEN	<i>Antennaria</i>	0–24	–
	tarragon	ARDR4	<i>Artemisia dracunculus</i>	0–24	–
	false boneset	BREU	<i>Brickellia eupatorioides</i>	0–24	–
	Texas croton	CRTE4	<i>Croton texensis</i>	0–24	–
	prairie clover	DALEA	<i>Dalea</i>	0–24	–
	blacksamson echinacea	ECAN2	<i>Echinacea angustifolia</i>	0–24	–
	common sunflower	HEAN3	<i>Helianthus annuus</i>	0–24	–
	stiff sunflower	HEPA19	<i>Helianthus pauciflorus</i>	0–24	–
	hairy false goldenaster	HEVI4	<i>Heterotheca villosa</i>	0–24	–
	goldenrod	SOLID	<i>Solidago</i>	0–24	–
	scarlet globemallow	SPCO	<i>Sphaeralcea coccinea</i>	0–24	–
	white heath aster	SYER	<i>Symphotrichum ericoides</i>	0–24	–
	spiderwort	TRADE	<i>Tradescantia</i>	0–24	–
	vervain	VERBE	<i>Verbena</i>	0–24	–
	Forb, annual	2FA	<i>Forb, annual</i>	0–24	–

Shrub/Vine

8	Shrubs			48–240	
	leadplant	AMCA6	<i>Amorpha canescens</i>	24–168	–
	rose	ROSA5	<i>Rosa</i>	24–120	–
	soapweed yucca	YUGL	<i>Yucca glauca</i>	24–48	–
	prairie sagewort	ARFR4	<i>Artemisia frigida</i>	0–48	–
	pricklypear	OPUNT	<i>Opuntia</i>	0–48	–

	SUBSTRUD (S.OM)	ZSUBS	SUBSTRUD (S.OM)	U-48	-
	western sandcherry	PRPUB	<i>Prunus pumila var. besseyi</i>	0-24	-
Tree					
9	Trees			0-120	
	ponderosa pine	PIPO	<i>Pinus ponderosa</i>	0-120	-
	juniper	JUNIP	<i>Juniperus</i>	0-24	-

Hydrological functions

Water is the principal factor limiting forage production on well drained portions of this site. Normal rainfall is limited to 17-22 inches per year. Soils on this site are in Hydrologic Soil Group A and B. Some areas have high water tables. On well drained portions of this site, infiltration potential is high. On well drained areas, significant runoff is expected to occur only during intense storms (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 variety of plants that bloom from spring until fall have an esthetic value that appeals to visitors.

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.

Data Source Number of Records Sample Period State County
SCS-RANGE-417 5 1968 – 1974 NE, SD Dawes, Sheridan, Mellette

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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, or barely visible and discontinuous.

- 3. Number and height of erosional pedestals or terracettes:** Typically non-existent, but steeper areas may have limited pedestalling of bunchgrasses. 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):** 0 to 5 percent is typical.

- 5. Number of gullies and erosion associated with gullies:** None should be present.

- 6. Extent of wind scoured, blowouts and/or depositional areas:** None.

- 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):** 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 8 inches thick with mollic (dark) colors when moist. Structure typically is medium to fine granular at least 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.
-

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 rhizomatous grasses > Mid warm-season bunchgrasses >

Sub-dominant: Mid cool-season bunchgrasses > Short warm-season grasses >

Other: Rhizomatous wheatgrass = Forbs = Shrubs > Short cool-season grasses/grass-likes > Trees

Additional: Other grasses in other functional groups occur 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 typically 50 to 70 percent, with depth 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 1,800 to 3,000 pounds/acre, with the reference value being 2,400 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, 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.
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