

Ecological site R058DY028SD Shallow Sandy

Accessed: 05/06/2024

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.

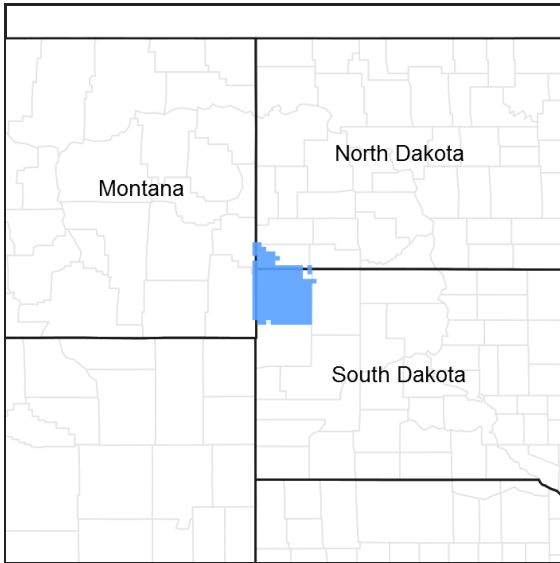


Figure 1. Mapped extent

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: 43e – Sagebrush Steppe.

Associated sites

R058DY009SD	Sandy
R058DY010SD	Loamy
R058DY026SD	Thin Sandy

Similar sites

R058DY010SD	Loamy Loamy [more western wheatgrass; less needleandthread; more production]
R058DY009SD	Sandy Sandy [more western wheatgrass; more production]

Table 1. Dominant plant species

Tree	Not specified
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Shrub	Not specified
Herbaceous	(1) <i>Calamovilfa longifolia</i> (2) <i>Schizachyrium scoparium</i>

Physiographic features

This site occurs on moderate to steeply sloping uplands.

Table 2. Representative physiographic features

Landforms	(1) Ridge
Flooding frequency	None
Ponding frequency	None
Elevation	701–1,219 m
Slope	6–40%
Water table depth	203 cm
Aspect	Aspect is not a significant factor

Climatic features

The climate in this MLRA is typical of the drier portions of the Northern Great Plains where sagebrush steppes to the west yield to grassland to the east. Annual precipitation ranges from 14 to 16 inches. Most of the rainfall occurs as frontal storms early in the growing season. Some high intensity, convective thunderstorms occur in the summer. Precipitation in winter occurs as snow. Temperatures show a wide range between summer and winter and between daily maximums and minimums, due to the high elevation and dry air, which permits rapid incoming and outgoing radiation. Outbreaks of cold air from Canada in winter move rapidly from northwest to southeast and account for extreme minimum temperatures. Extreme storms may occur during the winter but most severely affect ranch operations during late winter and spring. The normal average annual temperature is about 44°F. January is the coldest month with average temperatures ranging from about 12°F (Marmarth, North Dakota (ND)), to about 20°F (Baker, Montana (MT)). July is the warmest month with temperatures averaging from about 70°F (Marmarth, ND), to about 76°F (Baker, MT). The range of normal average monthly temperatures between the coldest and warmest months is about 55°F. Hourly winds are estimated to average about 11 miles per hour (mph) annually, ranging from about 13 mph during the spring to about 10 mph during the summer. Daytime winds are generally stronger than nighttime and strong storms may bring brief periods of high winds with gusts to more than 50 mph.

Growth of cool-season plants begins in early to mid-March, slowing or ceasing in late June. Warm-season plants begin growth about mid-May and can continue to early or mid-September. Greenup 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)	123 days
Freeze-free period (average)	140 days
Precipitation total (average)	406 mm

Influencing water features

No significant water features influence this site.

Soil features

The features common to soils in this site are the loamy fine sand or fine sandy loam textured surface layers and slopes of 6 to 40 percent. The soils in this site are excessively drained and formed in residuum weathered from

sandstone. The surface layer is three to five inches thick. The texture of the subsurface layers range from loamy fine sand 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 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.

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

Table 4. Representative soil features

Surface texture	(1) Loamy fine sand (2) Fine sandy loam
Family particle size	(1) Sandy
Drainage class	Excessively drained
Permeability class	Moderately rapid
Soil depth	25–51 cm
Surface fragment cover <=3"	0–5%
Surface fragment cover >3"	0–5%
Available water capacity (0-101.6cm)	2.54–5.08 cm
Calcium carbonate equivalent (0-101.6cm)	0–10%
Electrical conductivity (0-101.6cm)	0 mmhos/cm
Sodium adsorption ratio (0-101.6cm)	0
Soil reaction (1:1 water) (0-101.6cm)	6.6–8.4
Subsurface fragment volume <=3" (Depth not specified)	0–5%
Subsurface fragment volume >3" (Depth not specified)	0–5%

Ecological dynamics

This site developed under Northern Great Plains climatic conditions, natural influences of large herbivores, occasional fire, 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.

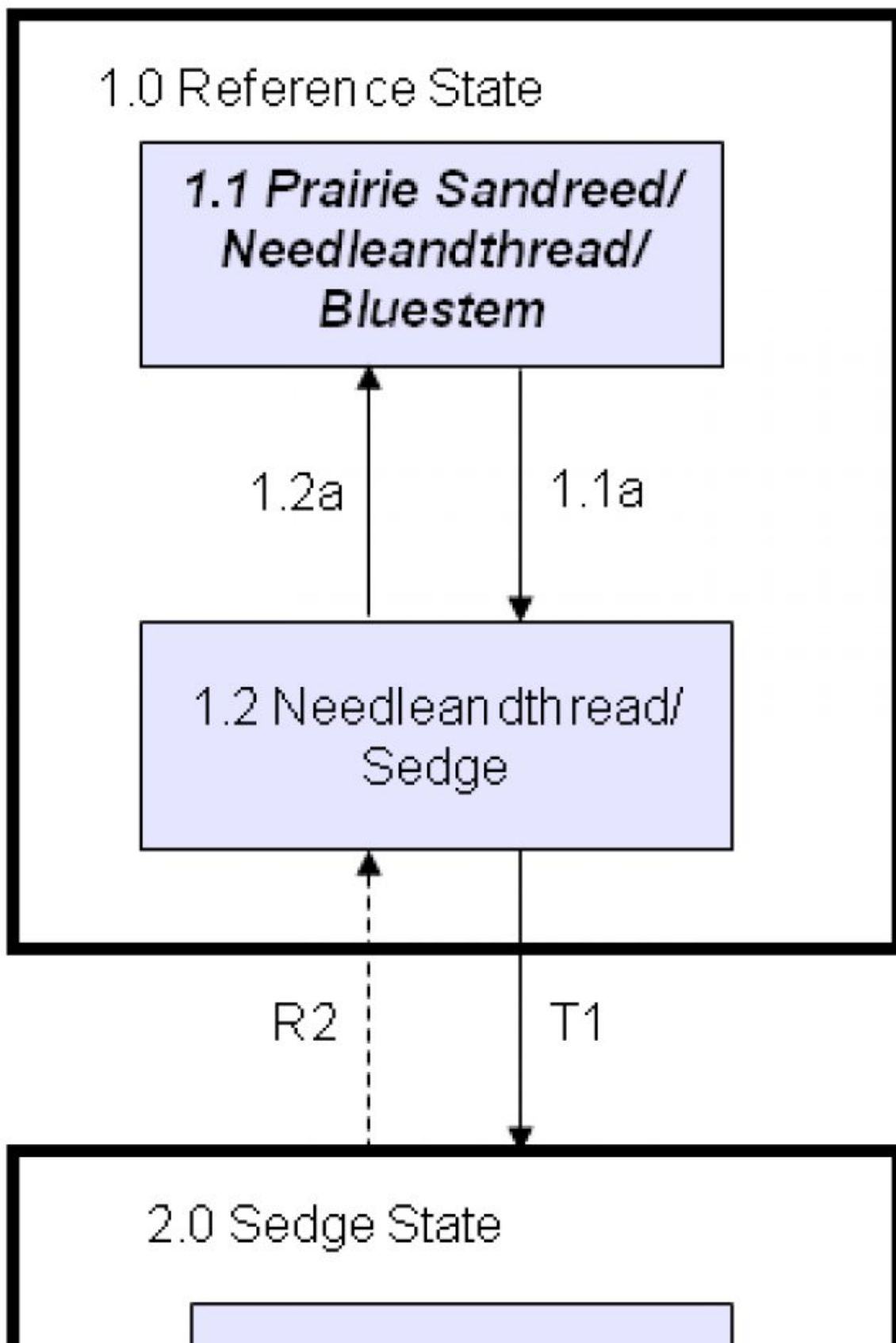
As this site deteriorates, species such as threadleaf sedge and fringed sagewort will increase. Mid-grasses such as prairie sandreed and little bluestem will decrease in frequency and production.

The plant community upon which interpretations are primarily based is the Prairie Sandreed/Needleandthread/Bluestem Plant Community. This plant community has been determined by studying 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 are discussed in more detail in the plant community descriptions following the diagram.

State and transition model



2.1 Sedge/ Clubmoss

State 1 Reference

The State narrative is under development.

Community 1.1 Prairie Sandreed/Needleandthread/Bluestem

The plant community upon which interpretations are primarily based is the Prairie Sandreed/Needleandthread/Bluestem Plant Community. This is also considered climax. Potential vegetation is about 80 to 90 percent grasses or grass-like plants, 5 to 10 percent forbs, and 5 to 10 percent shrubs. The plant community is a mix of warm- and cool-season grasses. Major grasses include prairie sandreed, needleandthread, and little bluestem. Other significant grasses present include sand bluestem, plains muhly, western wheatgrass, and sedge. The plant community is stable and well adapted to the Northern Great Plains climatic conditions. The diversity in plant species allows for high drought resistance. This is a sustainable plant community (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	863	1334	1894
Shrub/Vine	73	118	174
Forb	73	118	174
Total	1009	1570	2242

Figure 5. Plant community growth curve (percent production by month).
SD5804, Northern Rolling High Plains, warm-season dominant, cool-season
sub-dominant.. Warm-season dominant, cool-season sub-dominant,
uplands..

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0	0	3	7	18	24	25	15	7	1	0	0

Community 1.2 Needleandthread/Sedge

This plant community is the result of continuous season-long grazing. The dominant grass and grass-like species include needleandthread, sedge, prairie sandreed, and blue grama. When compared to the Prairie Sandreed/Needleandthread/Bluestem Plant Community, prairie sandreed, sand bluestem, and little bluestem have decreased. Sedge, needleandthread, and blue grama have increased. This community is well suited to grazing by both domestic livestock and wildlife, during the spring summer and fall. The communities' soil, biotic integrity and watershed are intact, although more than normal runoff may occur due to the sod forming vegetation.

Table 6. Annual production by plant type

Plant Type	Low (Kg/Hectare)	Representative Value (Kg/Hectare)	High (Kg/Hectare)
Grass/Grasslike	673	1047	1519
Forb	56	92	135
Shrub/Vine	56	92	135
Moss	–	2	6
Total	785	1233	1795

Figure 7. Plant community growth curve (percent production by month). SD5803, Northern Rolling High Plains, cool-season/warm-season co-dominant.. Cool-season, warm-season co-dominant, uplands..

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0	0	3	10	20	28	21	10	5	3	0	0

Pathway 1.1a
Community 1.1 to 1.2

Continuous season-long grazing will convert the plant community to the Needleandthread/Sedge Plant Community.

Pathway 1.2a
Community 1.2 to 1.1

Prescribed grazing or prescribed burning followed by prescribed grazing will return this plant community to the Prairie Sandreed/Needleandthread/Bluestem Plant Community.

Conservation practices

Prescribed Grazing

State 2
Sedge

The State narrative is under development.

Community 2.1
Sedge/Clubmoss

This plant community is the result of heavy continuous grazing or continuous seasonal grazing. Mid- and tall cool-season and warm-season grasses have decreased and sedge and blue grama increase along with clubmoss forming a very stable sod condition. Yucca and fringed sagewort have also increased. Total annual production is significantly reduced. The soil is generally well protected on this plant community. The biotic integrity is reduced due to low vegetative production. The sod formed by these grasses is resistant to water infiltration. While this sod protects the site, offsite areas are affected by excessive runoff that may cause gully erosion. This sod is resistant to change and may require practices such as long-term prescribed grazing to return to a mid-/tall grass community.

Table 7. Annual production by plant type

Plant Type	Low (Kg/Hectare)	Representative Value (Kg/Hectare)	High (Kg/Hectare)
Grass/Grasslike	482	716	1160
Forb	39	89	143
Shrub/Vine	39	89	142
Moss	–	3	11
Total	560	897	1456

Figure 9. Plant community growth curve (percent production by month). SD5802, Northern Rolling High Plains, cool-season dominant, warm-season subdominant. Cool-season dominant, warm-season subdominant..

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0	0	3	10	23	34	15	6	5	4	0	0

Transition T1 State 1 to 2

Heavy continuous grazing or continuous seasonal grazing (grazing at the same time of year every year with inadequate recovery periods) will convert this plant community to the Sedge/Clubmoss Plant Community.

Restoration pathway R2 State 2 to 1

Long-term prescribed grazing will eventually return this plant community to the Needleandthread/Sedge/Broom Plant Community.

Conservation practices

Prescribed Grazing

Additional community tables

Table 8. Community 1.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production (Kg/Hectare)	Foliar Cover (%)
Grass/Grasslike					
1	Tall Warm-Season Grasses			314–549	
	prairie sandreed	CALO	<i>Calamovilfa longifolia</i>	235–471	–
	sand bluestem	ANHA	<i>Andropogon hallii</i>	31–157	–
	big bluestem	ANGE	<i>Andropogon gerardii</i>	0–78	–
2	Cool-Season Bunch Grasses			157–314	
	needle and thread	HECOC8	<i>Hesperostipa comata ssp. comata</i>	157–314	–
	green needlegrass	NAVI4	<i>Nassella viridula</i>	0–78	–
	bluebunch wheatgrass	PSSP6	<i>Pseudoroegneria spicata</i>	0–78	–
3	Warm-Season Grasses			78–314	
	little bluestem	SCSC	<i>Schizachyrium scoparium</i>	78–235	–
	plains muhly	MUCU3	<i>Muhlenbergia cuspidata</i>	16–157	–
	Grass, perennial	2GP	<i>Grass, perennial</i>	0–78	–
	sideoats grama	BOCU	<i>Bouteloua curtipendula</i>	0–78	–
4	Short-Warm Season Grasses			31–126	

	blue grama	BOGR2	<i>Bouteloua gracilis</i>	16–78	–
	hairy grama	BOHI2	<i>Bouteloua hirsuta</i>	16–78	–
	sand dropseed	SPCR	<i>Sporobolus cryptandrus</i>	16–78	–
	Fendler threeawn	ARPUL	<i>Aristida purpurea</i> var. <i>longiseta</i>	0–47	–
5	Cool-Season Grasses			78–235	
	western wheatgrass	PASM	<i>Pascopyrum smithii</i>	31–157	–
	thickspike wheatgrass	ELLAL	<i>Elymus lanceolatus</i> ssp. <i>lanceolatus</i>	0–78	–
	prairie Junegrass	KOMA	<i>Koeleria macrantha</i>	16–78	–
	Grass, native	2GN	<i>Grass, native</i>	0–78	–
	Scribner's rosette grass	DIOLS	<i>Dichanthelium oligosanthes</i> var. <i>scribnerianum</i>	16–31	–
6	Grass-Likes			31–157	
	threadleaf sedge	CAFI	<i>Carex filifolia</i>	31–157	–
	Grass-like (not a true grass)	2GL	<i>Grass-like (not a true grass)</i>	16–78	–
Forb					
8	Forbs			78–157	
	Forb, native	2FN	<i>Forb, native</i>	16–78	–
	field sagewort	ARCA12	<i>Artemisia campestris</i>	16–47	–
	white sagebrush	ARLU	<i>Artemisia ludoviciana</i>	16–47	–
	stiff sunflower	HEPA19	<i>Helianthus pauciflorus</i>	16–47	–
	hairy false goldenaster	HEVI4	<i>Heterotheca villosa</i>	16–31	–
	blazing star	LIATR	<i>Liatris</i>	16–31	–
	purple prairie clover	DAPU5	<i>Dalea purpurea</i>	16–31	–
	scurfpea	PSORA2	<i>Psoralegium</i>	16–31	–
	upright prairie coneflower	RACO3	<i>Ratibida columnifera</i>	16–31	–
	goldenrod	SOLID	<i>Solidago</i>	16–31	–
	scarlet beeblossom	GACO5	<i>Gaura coccinea</i>	16–31	–
	American vetch	VIAM	<i>Vicia americana</i>	16–31	–
	longbract spiderwort	TRBR	<i>Tradescantia bracteata</i>	0–16	–
	cutleaf anemone	PUPAM	<i>Pulsatilla patens</i> ssp. <i>multifida</i>	0–16	–
	blacksamson echinacea	ECAN2	<i>Echinacea angustifolia</i>	0–16	–
	narrowleaf stoneseed	LIIN2	<i>Lithospermum incisum</i>	0–16	–
	rush skeletonplant	LYJU	<i>Lygodesmia juncea</i>	0–16	–
	purple locoweed	OXLA3	<i>Oxytropis lambertii</i>	0–16	–
	beardtongue	PENST	<i>Penstemon</i>	0–16	–
	spiny phlox	PHHO	<i>Phlox hoodii</i>	0–16	–
	milkvetch	ASTRA	<i>Astragalus</i>	0–16	–
	wavyleaf thistle	CIUN	<i>Cirsium undulatum</i>	0–16	–
	western yarrow	ACMIO	<i>Achillea millefolium</i> var. <i>occidentalis</i>	0–16	–
	Cuman ragweed	AMPS	<i>Ambrosia psilostachya</i>	0–16	–
	pussytoes	ANTEN	<i>Antennaria</i>	0–16	–
Shrub/Vine					

9	Shrubs			78–157	
	Shrub (>.5m)	2SHRUB	<i>Shrub (>.5m)</i>	0–78	–
	skunkbush sumac	RHTR	<i>Rhus trilobata</i>	0–47	–
	rose	ROSA5	<i>Rosa</i>	16–47	–
	soapweed yucca	YUGL	<i>Yucca glauca</i>	16–31	–
	western sandcherry	PRPUB	<i>Prunus pumila var. besseyi</i>	16–31	–
	prairie sagewort	ARFR4	<i>Artemisia frigida</i>	16–31	–
	pricklypear	OPUNT	<i>Opuntia</i>	0–16	–

Table 9. Community 1.2 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production (Kg/Hectare)	Foliar Cover (%)
Grass/Grasslike					
1	Tall Warm-Season Grasses			25–185	
	prairie sandreed	CALO	<i>Calamovilfa longifolia</i>	25–185	–
	sand bluestem	ANHA	<i>Andropogon hallii</i>	0–49	–
	big bluestem	ANGE	<i>Andropogon gerardii</i>	0–37	–
2	Cool-Season Bunch Grasses			185–308	
	needle and thread	HECOC8	<i>Hesperostipa comata ssp. comata</i>	185–308	–
	green needlegrass	NAVI4	<i>Nassella viridula</i>	0–37	–
3	Warm-Season Grasses			0–62	
	Grass, perennial	2GP	<i>Grass, perennial</i>	0–62	–
	plains muhly	MUCU3	<i>Muhlenbergia cuspidata</i>	0–62	–
	little bluestem	SCSC	<i>Schizachyrium scoparium</i>	0–62	–
	sideoats grama	BOCU	<i>Bouteloua curtipendula</i>	0–37	–
4	Short-Warm Season Grasses			123–247	
	blue grama	BOGR2	<i>Bouteloua gracilis</i>	62–185	–
	hairy grama	BOHI2	<i>Bouteloua hirsuta</i>	25–99	–
	sand dropseed	SPCR	<i>Sporobolus cryptandrus</i>	25–99	–
	Fendler threeawn	ARPUL	<i>Aristida purpurea var. longiseta</i>	12–62	–
5	Cool-Season Grasses			62–123	
	Grass, native	2GN	<i>Grass, native</i>	0–62	–
	prairie Junegrass	KOMA	<i>Koeleria macrantha</i>	12–62	–
	western wheatgrass	PASM	<i>Pascopyrum smithii</i>	12–62	–
	Scribner's rosette grass	DIOLS	<i>Dichanthelium oligosanthes var. scribnerianum</i>	12–37	–
	thickspike wheatgrass	ELLAL	<i>Elymus lanceolatus ssp. lanceolatus</i>	0–37	–
6	Grass-Likes			185–308	
	threadleaf sedge	CAFI	<i>Carex filifolia</i>	123–247	–
	Grass-like (not a true grass)	2GL	<i>Grass-like (not a true grass)</i>	25–123	–
7	Non-Native Grasses			12–62	
	cheatgrass	BRTE	<i>Bromus tectorum</i>	12–62	–
	bluegrass	POA	<i>Poa</i>	0–62	–
Forb					

8	Forbs			62–123	
	field sagewort	ARCA12	<i>Artemisia campestris</i>	12–62	–
	white sagebrush	ARLU	<i>Artemisia ludoviciana</i>	12–62	–
	Forb, introduced	2FI	<i>Forb, introduced</i>	0–62	–
	Forb, native	2FN	<i>Forb, native</i>	12–62	–
	scurfpea	PSORA2	<i>Psoraleidium</i>	12–37	–
	goldenrod	SOLID	<i>Solidago</i>	12–25	–
	western yarrow	ACMIO	<i>Achillea millefolium var. occidentalis</i>	0–25	–
	Cuman ragweed	AMPS	<i>Ambrosia psilostachya</i>	12–25	–
	pussytoes	ANTEN	<i>Antennaria</i>	0–12	–
	longbract spiderwort	TRBR	<i>Tradescantia bracteata</i>	0–12	–
	American vetch	VIAM	<i>Vicia americana</i>	0–12	–
	upright prairie coneflower	RACO3	<i>Ratibida columnifera</i>	0–12	–
	milkvetch	ASTRA	<i>Astragalus</i>	0–12	–
	wavyleaf thistle	CIUN	<i>Cirsium undulatum</i>	0–12	–
	purple prairie clover	DAPU5	<i>Dalea purpurea</i>	0–12	–
	blacksamson echinacea	ECAN2	<i>Echinacea angustifolia</i>	0–12	–
	scarlet beeblossom	GACO5	<i>Gaura coccinea</i>	0–12	–
	stiff sunflower	HEPA19	<i>Helianthus pauciflorus</i>	0–12	–
	hairy false goldenaster	HEVI4	<i>Heterotheca villosa</i>	0–12	–
	blazing star	LIATR	<i>Liatris</i>	0–12	–
	rush skeletonplant	LYJU	<i>Lygodesmia juncea</i>	0–12	–
	purple locoweed	OXLA3	<i>Oxytropis lambertii</i>	0–12	–
	spiny phlox	PHHO	<i>Phlox hoodii</i>	0–12	–
Shrub/Vine					
9	Shrubs			62–123	
	Shrub (>.5m)	2SHRUB	<i>Shrub (>.5m)</i>	0–62	–
	prairie sagewort	ARFR4	<i>Artemisia frigida</i>	12–62	–
	soapweed yucca	YUGL	<i>Yucca glauca</i>	12–49	–
	pricklypear	OPUNT	<i>Opuntia</i>	0–25	–
	skunkbush sumac	RHTR	<i>Rhus trilobata</i>	0–25	–
	rose	ROSA5	<i>Rosa</i>	12–25	–
	western sandcherry	PRPUB	<i>Prunus pumila var. besseyi</i>	0–12	–
Moss					
10	Cryptogams			0–37	
	lesser spikemoss	SEDE2	<i>Selaginella densa</i>	0–37	–

Table 10. Community 2.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production (Kg/Hectare)	Foliar Cover (%)
Grass/Grasslike					
1	Tall Warm-Season Grasses			0–45	
	prairie sandreed	CALO	<i>Calamovilfa longifolia</i>	0–45	–

2	Cool-Season Bunch Grasses			9-72	
	needle and thread	HECOC8	<i>Hesperostipa comata ssp. comata</i>	9-72	-
3	Warm-Season Grasses			0-18	
	little bluestem	SCSC	<i>Schizachyrium scoparium</i>	0-18	-
4	Short-Warm Season Grasses			135-224	
	blue grama	BOGR2	<i>Bouteloua gracilis</i>	90-179	-
	hairy grama	BOHI2	<i>Bouteloua hirsuta</i>	20-90	-
	sand dropseed	SPCR	<i>Sporobolus cryptandrus</i>	9-90	-
	Fendler threeawn	ARPUL	<i>Aristida purpurea var. longiseta</i>	9-90	-
5	Cool-Season Grasses			18-72	
	Grass, native	2GN	<i>Grass, native</i>	0-45	-
	prairie Junegrass	KOMA	<i>Koeleria macrantha</i>	9-36	-
	Scribner's rosette grass	DIOLS	<i>Dichanthelium oligosanthes var. scribnerianum</i>	9-18	-
	western wheatgrass	PASM	<i>Pascopyrum smithii</i>	0-9	-
6	Grass-Likes			179-359	
	threadleaf sedge	CAFI	<i>Carex filifolia</i>	135-314	-
	Grass-like (not a true grass)	2GL	<i>Grass-like (not a true grass)</i>	45-135	-
7	Non-Native Grasses			9-63	
	cheatgrass	BRTE	<i>Bromus tectorum</i>	9-63	-
	bluegrass	POA	<i>Poa</i>	0-45	-
Forb					
8	Forbs			45-135	
	Forb, introduced	2FI	<i>Forb, introduced</i>	9-63	-
	field sagewort	ARCA12	<i>Artemisia campestris</i>	9-63	-
	white sagebrush	ARLU	<i>Artemisia ludoviciana</i>	18-63	-
	Forb, native	2FN	<i>Forb, native</i>	9-45	-
	scurfpea	PSORA2	<i>Psoralegium</i>	9-45	-
	western yarrow	ACMIO	<i>Achillea millefolium var. occidentalis</i>	0-27	-
	Cuman ragweed	AMPS	<i>Ambrosia psilostachya</i>	9-27	-
	goldenrod	SOLID	<i>Solidago</i>	9-18	-
	pussytoes	ANTEN	<i>Antennaria</i>	0-9	-
	milkvetch	ASTRA	<i>Astragalus</i>	0-9	-
	rush skeletonplant	LYJU	<i>Lygodesmia juncea</i>	0-9	-
	spiny phlox	PHHO	<i>Phlox hoodii</i>	0-9	-
Shrub/Vine					
9	Shrubs			45-135	
	prairie sagewort	ARFR4	<i>Artemisia frigida</i>	18-90	-
	soapweed yucca	YUGL	<i>Yucca glauca</i>	9-72	-
	pricklypear	OPUNT	<i>Opuntia</i>	9-36	-
	Shrub (>.5m)	2SHRUB	<i>Shrub (>.5m)</i>	0-27	-
	rose	ROSA5	<i>Rosa</i>	0-9	-
Moss					
10	Cryptogams			0-45	

	lesser spikemoss	SEDE2	<i>Selaginella densa</i>	0–45	–
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Animal community

Animal Community – Wildlife Interpretations

Major Land Resource Area (MLRA) 58D lies within the drier portion of Northern mixed-grass prairie ecosystem where sagebrush steppes to the west yield to grassland steppes to the east. Prior to European settlement, this area consisted of diverse grass/shrub land habitats interspersed with varying densities of depressional, instream wetlands, and woody riparian corridors. These habitats provided critical life cycle components for many of its users. Many species of grassland birds, small mammals, reptiles, amphibians, and herds of roaming bison, elk, and pronghorn were among the inhabitants adapted to this semi-arid region. Roaming herbivores, as well as, several small mammal and insect species, were the primary consumers linking the grassland resources to predators such as the wolf, mountain lion, and grizzly bear, as well as, smaller carnivores such as the coyote, bobcat, fox, and raptors. The black-tailed prairie dog was once abundant; however, the species remains a keystone species within its range. The black-footed ferret, burrowing owl, ferruginous hawk, mountain plover, and swift fox were associated with prairie dog complexes.

Historically, the Northern mixed-grass prairie was a disturbance-driven ecosystem with fire, herbivory, and climate functioning as the primary disturbance factors either singly or in combination. Following European settlement, livestock grazing, cropland conversion, elimination of fire, energy development and other anthropogenic factors influenced species composition and abundance. Introduced and invasive species further impacted plant and animal communities. Bison were historically a keystone species but have been extirpated as a free-ranging herbivore. The loss of the bison, reduction of prairie dog colonies, and loss of fire as ecological drivers greatly influenced the character of the remaining native plant communities and altered wildlife habitats. Human development has reduced habitat quality for area-sensitive species.

Within MLRA 58D, the Shallow Sandy Ecological Site (ES) provides upland grassland cover with an associated forb and shrub component. It was typically part of an expansive grassland landscape that included combinations of Loamy, Shallow Loamy, Shallow Clayey, Thin Loamy, Claypan, Sands, Sandy, Sandy Claypan, Clayey, and Thin Claypan ESs. This site provided habitat for species requiring unfragmented grassland. Important habitat features include upland nesting habitat for grassland birds, forbs, and insects for brood habitat, and a forage source for small and large herbivores. Many grassland and shrub steppe nesting bird populations are declining. Extirpated species include free-ranging bison, grizzly bear, gray wolf, black-footed ferret, mountain plover, Rocky Mountain locust, and swift fox.

The majority of the Shallow Sandy ES remains intact and provides increasingly important habitat for grassland nesting birds, small rodents, coyotes, and a variety of reptiles, amphibians, and insects. Invasive species such as annual bromegrasses and crested wheat have impacted the biological integrity of the site for some grassland birds.

Prairie Sandreed/Needleandthread/Bluestem and Needleandthread/Sedge: The predominance of grasses plus high diversity of forbs and shrubs in this community favors grazers and mixed-feeders, such as deer and pronghorn. Insects, such as pollinators, play a large role in maintaining the forb community and provide a forage base for grassland birds and other species. The complex plant structural diversity provides habitat for a wide array of migratory and resident birds. Grasshopper sparrow, chestnut-collared longspur, Sprague's pipit, horned lark, lark bunting, and sharp-tailed grouse are common and benefit from the structure and composition this plant community provides. Diverse prey populations are available for grassland raptors such as ferruginous hawk, Swainson's hawk, golden eagle, and prairie falcon.

The diversity of grasses, forbs, and shrubs provide high nutrition levels for small and large herbivores including voles, mice, thirteen-lined ground squirrel, white-tailed jackrabbit, and deer. The higher stature of this plant community provides thermal, protective, and escape cover for herbivores and grassland birds. Predators utilizing this plant community include coyote, American badger, red fox, and long-tailed weasel. This plant community provides habitat for herptiles such as the spade foot toad, bull snake, and western rattlesnake.

Resulting from continuous season-long grazing, the warm-season grass component has been substantially reduced and a shift to a needleandthread and sedge community occurs. The forb and shrub diversity has not substantially decreased. The shift from the HCPC to the needleandthread/sedge community does not result in a significant

change to the wildlife community.

Sedge/Clubmoss: Resulting from heavy, continuous grazing or continuous seasonal grazing sedges and clubmoss will dominate. The decrease in diversity of grasses, forbs, and shrubs will result in less seed production or lower quality nutrition for small herbivores including voles, mice, and thirteen-lined ground squirrel. Species such as horned lark, upland sandpiper, and white-tailed jackrabbit will increase due to the loss of the tall grass component.

The short stature of this plant community limits suitable thermal, protective, and escape cover. Prey populations are reduced and are more vulnerable to raptor and mammalian predation. Predators utilizing this plant community include the coyote, American badger, red fox, and long-tailed weasel.

Extreme impairment of the ecological processes impacts offsite aquatic habitats through excessive runoff, nutrient, and sediment loads. Elevated surface temperatures resulting from reduced cover and litter will greatly reduce habitat for most amphibian species, grassland birds, and mammals.

Animal Community – Grazing Interpretations

As this site improves in condition through proper management (from the more shortgrass dominated plant communities to the interpretive plant community), the advantage for livestock production includes: higher forage production, improved summer forage production, and higher water infiltration. The Sedge/Clubmoss Plant Community is of limited value for livestock production.

Grazing by domestic livestock is one of the major income-producing industries in the area. Rangeland in this area may provide yearlong forage. During the dormant period, the forage for livestock will likely be lacking protein to meet livestock requirements, and added protein will allow ruminants to better utilize the energy stored in grazed plant materials. A forage quality test (either directly or through fecal sampling) should be used to determine the level of supplementation needed.

Hydrological functions

Water is the principal factor limiting forage production on this site. This site is dominated by soils in hydrologic group C. Infiltration and runoff potential for this site varies from moderate to high depending on soil hydrologic group, slope, and ground cover. In many cases, areas with greater than 75 percent ground cover have the greatest potential for high infiltration and lower runoff. An exception would be where shortgrasses form a strong sod and dominate the site. Normally, areas where ground cover is less than 50 percent have the greatest potential to have reduced infiltration and higher runoff (refer to Section 4, NRCS National Engineering Handbook for runoff quantities and hydrologic curves).

Recreational uses

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

Wood products

No appreciable wood products are typically present on this site.

Other products

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

Inventory data references

Information presented here has been derived from NRCS clipping data and other inventory data. Field observations and experience were also used. Those involved in developing this site description include: Ryan Beer, Range Management Specialist (RMS), NRCS; Stan Boltz, RMS, NRCS; Dave Dewald, Wildlife BIO, NRCS; Jody Forman,

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Other references

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

USDA, NRCS. National Water and Climate Center, 101 SW Main, Suite 1600, Portland, OR 97204-3224.
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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

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Contributors

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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	05/07/2010
Approved by	Stan Boltz
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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 when present.

3. **Number and height of erosional pedestals or terracettes:** Few pedestalled plants typically on steeper slopes.

4. **Bare ground from Ecological Site Description or other studies (rock, litter, lichen, moss, plant canopy are not bare ground):** 0 to 15 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):** Very little litter movement of smallest size class.

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 (peds) 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 3 to 5 inches thick with light grayish brown colors. Structure should typically be 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 & deep rooted species (mid & tall rhizomatous and tufted perennial cool- and warm-season grasses) with fine & coarse roots positively influence 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/tall cool-season bunchgrasses = Mid warm-season grasses >

Sub-dominant: Mid/short cool-season grasses >

Other: Grass-likes = Forbs = Shrubs > Short warm-season grasses

Additional:

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):**

15. **Expected annual annual-production (this is TOTAL above-ground annual-production, not just forage annual-production):** Production ranges from 900-2,000 lbs./acre (air-dry weight). Reference value production is 1,400 lbs./acre (air-dry weight).
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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:** State and local noxious weeds
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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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