

# Ecological site R054XY043ND Shallow Sandy

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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.

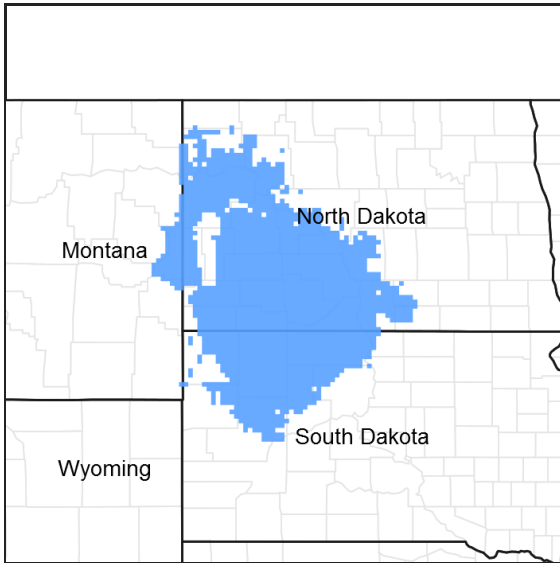


Figure 1. Mapped extent

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: 43a – Missouri Plateau.

## Associated sites

R054XY025ND	<b>Sands</b>
R054XY026ND	<b>Sandy</b>
R054XY034ND	<b>Choppy Sands</b>
R054XY035ND	<b>Very Shallow</b>
R054XY045ND	<b>Limy Sands</b>

## Similar sites

R054XY027ND	<p><b>Sandy Claypan</b>  [Well drained soils on uplands and terraces that don't receive extra moisture with a dense sodic subsoil below 6 inches with salts below 16 inches. Subsoil will ribbon up to 1 inch. Indicator species are western wheatgrass intermixed with areas of prairie sandreed both dominating with an understory of needleandthread and blue grama, heath aster, cudweed sagewort and western yarrow along with fringed sagewort. This site has more production, a limiting layer above 20 inches but with a dense sodic subsoil below 6 inches with salts below 16 inches, less little bluestem, plains muhly, sideoats grama, more western wheatgrass, usually different landscape positions.]</p>
R054XY034ND	<p><b>Choppy Sands</b>  [Deep entisol found on knobs and ridges of level to choppy sand blown plains; will not ribbon, found upslope from sands and sandy terrace sites; won't ribbon. Indicator species: Sand bluestem, prairie sandreed and needleandthread evenly mixed, some Canada wildrye, penstemon, lemon scurfpea western ragweed, yucca, silky prairie clover and leadplant. This site has similar production, more little bluestem, sand bluestem, and sedges, less needle-andthread, no restrictive layer within twenty inches.]</p>
R054XY045ND	<p><b>Limy Sands</b>  [Moderately deep entisol, usually calcareous within 4 inches to the surface, found on knobs and/or sideslopes of hills and buttes; will not form a ribbon; up slope of sands or sandy and down slope from shallow sandy ecological sites. Indicator species: Little bluestem, sand bluestem, and prairie sandreed, along with penstemon, silverleaf scurfpea, purple coneflower, yucca, creeping juniper, and leadplant. This site has more production, more little bluestem, porcupinegrass, big bluestem or sand bluestem and less blue grama, less plains muhly, sedges and needleandthread, no restrictive layer within twenty inches.]</p>
R054XY038ND	<p><b>Thin Loamy</b>  [Deep and moderately deep entisols, usually calcareous within 4 inches to the surface, found on knobs and/or sideslopes of hills and buttes. Will form a ribbon greater than 1 inches but not more than 2 inches. Up slope of loamy and down slope of thin loamy or shallow loamy ecological sites. Indicator species: western wheatgrass, little bluestem, plains muhly, porcupinegrass and sideoats grama, with Missouri goldenrod, dotted gayfeather, pasqueflower, purple coneflower and purple prairie clover, and shrubs like winterfat and prairie rose. This site has more production, less little bluestem, sedges and blue grama, no sand bluestem, more porcupinegrass, big bluestem and needleandthread, no restrictive layer within twenty inches.]</p>
R054XY025ND	<p><b>Sands</b>  [Does not receive additional moisture. Found on dry uplands, upslope from sandy terraces or loamy overflow sites, down slope from limy sands or shallow sandy sites. Similar landscape position as loamy, sandy, and clayey sites. Won't form a ribbon; indicator species are sand bluestem and prairie sandreed evenly mixed, some Canada wildrye, penstemon, and leadplant and western snowberry. This site has more production, less little bluestem, blue grama and sedges, more prairie sandreed and sand bluestem, no restrictive layer within twenty inches, usually different landscape positions.]</p>
R054XY030ND	<p><b>Shallow Loamy</b>  [Some what excessively well drained soils more than 10 less than 20 inches to sedimentary bedrock that restricts root penetration. Surface layer will ribbon less than 2 inches and greater than 1 inch. Upslope from thin loamy or loamy sites and some times down slope form very shallow ecological sites. Indicator species: little bluestem, plains muhly, needle grasses and sideoats grama, with dotted gayfeather, pasqueflower, purple coneflower and purple prairie clover, and shrubs like broom snakeweed. This site has similar species but less little bluestem, sand bluestem, prairie sandreed and sedges, more plains muhly, green needlegrass, western wheatgrass, restrictive layer above twenty inches is not sandstone or gravels, slightly less production.]</p>
R054XY035ND	<p><b>Very Shallow</b>  [Excessively well drained soils less than 10 inches to scoria, gravels, shales, siltstone or sandstone bedrock that restricts root penetration, upslope of shallow clayey, shallow loamy or shallow sandy ecological sites. Indicator species are little bluestem, sideoats grama, blue grama, purple coneflower, pasqueflower and creeping juniper. This site has similar species but more needleandthread, blue grama and little bluestem, less prairie sandreed, sand bluestem, restrictive layer above 10 inches bedrock or gravels, less production.]</p>
R054XY026ND	<p><b>Sandy</b>  [Does not receive additional moisture. Found on dry uplands upslope from sandy terraces or loamy overflow sites, down slope from limy sands or shallow sandy sites. Similar landscape position as loamy, sands, clayey sites; will ribbon up to 1 inches. Indicator species are prairie sandreed with western wheatgrass and green needlegrass intermixed. This site has more production, no limiting layer above 20 inches, less little bluestem, plains muhly, sideoats grama, more prairie sandreed, usually different landscape positions.]</p>

**Table 1. Dominant plant species**

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

## Physiographic features

This site occurs on gently sloping to moderately steep sedimentary uplands.

**Table 2. Representative physiographic features**

Landforms	(1) Hill (2) Outwash plain (3) Ridge
Flooding frequency	None
Ponding frequency	None
Elevation	488–1,097 m
Slope	3–50%
Aspect	Aspect is not a significant factor

## Climatic features

MLRA 54 is considered to have a continental climate – cold winters and hot summers, low humidity, light rainfall, and much sunshine. Extremes in temperature are characteristic. The climate is the result of this MLRA's location in the geographic center of North America. There are few natural barriers on the northern Great Plains. The air masses move unobstructed across the plains and account for rapid changes in temperature.

Annual precipitation ranges from 14 to 18 inches per year. The normal average annual temperature is about 42° F. January is the coldest month with average temperatures ranging from about 13° F (Beach, ND) to about 16° F (Bison, SD). July is the warmest month with temperatures averaging from about 69° F (Beach, ND) to about 72° F (Timber Lake, SD). The range of normal average monthly temperatures between the coldest and warmest months is about 57° F. This large annual range attests to the continental nature of this MLRA'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 native cool-season plants begins in late March and continues to early to mid July. Native warm-season plants begin growth in mid May and continue to the end of August. Green up of cool-season plants can occur in September and October when adequate soil moisture is present.

**Table 3. Representative climatic features**

Frost-free period (average)	136 days
Freeze-free period (average)	157 days
Precipitation total (average)	457 mm

## Influencing water features

No significant water features influence this site.

## Soil features

The common features of soils in this site are the loamy fine sand, fine sandy loam subsoils or loam subsoils (with sand and gravels at 14 inches) and slopes of 3 to 50 percent. The soils in this site are somewhat excessive to excessively drained and formed in residuum and alluvium. The loamy fine sand, fine sandy loam, or loam surface layer is 3 to 6 inches thick. The soils have a moderate to rapid infiltration rate. This site typically 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 restrictive to water movement and root penetration. The low available water capacity has a strong effect on the soil-water-plant relationship.

These soils are susceptible to water erosion and to a lesser degree wind erosion. The hazard of water erosion increases where vegetative cover is not adequate. Loss of the soil surface layer can result in a shift in species composition and/or production.

Major soil series correlated to this ecological site can be found in Section II of the Natural Resources Conservation Service Field Office Technical Guide or the following web sites:

North Dakota <http://www.nd.nrcs.usda.gov/>

South Dakota <http://www.sd.nrcs.usda.gov/>

Montana <http://www.mt.nrcs.usda.gov/>

**Table 4. Representative soil features**

Surface texture	(1) Very gravelly loamy fine sand (2) Fine sandy loam (3) Loam
Family particle size	(1) Sandy
Drainage class	Somewhat excessively drained to excessively drained
Permeability class	Moderate to rapid
Soil depth	25–51 cm
Surface fragment cover ≤3"	0–10%
Surface fragment cover >3"	0–5%
Available water capacity (0-101.6cm)	2.54–12.7 cm
Calcium carbonate equivalent (0-101.6cm)	5–15%
Electrical conductivity (0-101.6cm)	0–2 mmhos/cm
Sodium adsorption ratio (0-101.6cm)	0–2
Soil reaction (1:1 water) (0-101.6cm)	6.1–8.4
Subsurface fragment volume ≤3" (Depth not specified)	0–10%
Subsurface fragment volume >3" (Depth not specified)	0–5%

## Ecological dynamics

This site developed under Northern Great Plains climatic conditions, and included natural influence of large herbivores and occasional fire. Changes will occur in the plant communities due to climatic conditions and/or management actions. Due to the nature of the soils, the site is considered quite fragile. Under continued adverse impacts, a rapid decline in vegetative vigor and composition will occur. Under favorable vegetative management treatments the site can slowly return to the Historic Climax Plant Community (HCPC).

The plant community upon which interpretations are primarily based is the Historic Climax Plant Community. The HCPC 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 considered. Subclimax plant communities, states, transitional pathways, and thresholds have been determined through similar studies and experience.

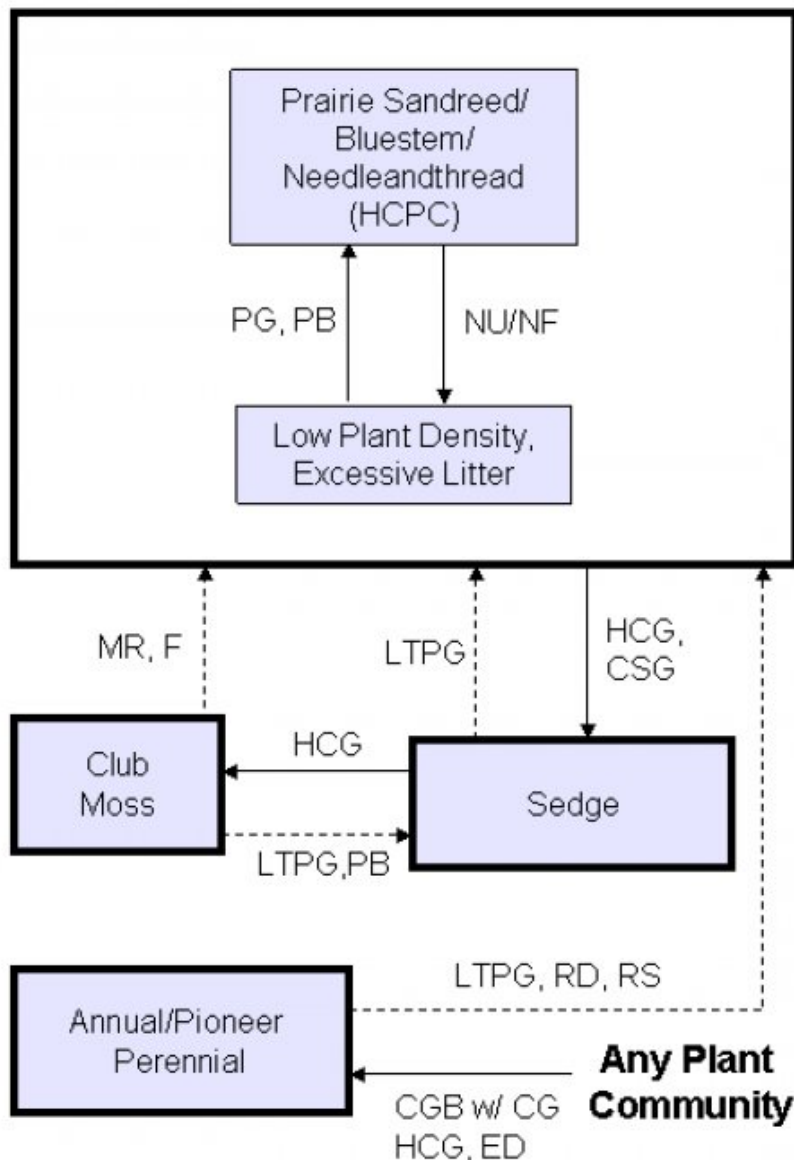
Heavy continuous grazing or continuous seasonal (spring) grazing without adequate recovery opportunities following each grazing event during the growing season will cause threadleaf sedge to increase. Species such as prairie sandreed, sand bluestem and little bluestem will decrease in frequency and production.

In time, heavy continuous grazing will likely cause upland sedges and blue grama to dominate and pioneer perennials, annuals, and club moss (in its range) to increase. This plant community is relatively stable and the competitive advantage prevents other species from establishing. This plant community is less productive than the HCPC. Runoff increases and infiltration will decrease. Soil erosion will be minimal.

Extended periods of non-use and/or lack of fire will result in a plant community having high litter levels causing decadence, mortality and an increase of cool season grasses such as Kentucky bluegrass and/or smooth brome grass.

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**



**CGB w/ CG** - cropped go-back with continuous grazing; **CSG** - continuous seasonal grazing; **ED** - excessive defoliation; **F** - fertilization followed with prescribed grazing; **HCG** - heavy continuous grazing; **HCPC** - Historical Climax Plant Community; **LTPG** - long-term prescribed grazing; **MR** - mechanical renovation with prescribed grazing; **NU/NF** - extended period of non-use & no fire; **PB** - prescribed burning; **PG** - prescribed grazing; **RD** - removal of disturbance; **RS** - range seeding followed by prescribed grazing.

**State 1**  
**Prairie Sandreed/Bluestem/Needleandthread (HCPC)**

## Community 1.1 Prairie Sandreed/Bluestem/Needleandthread (HCPC)

This is the interpretive plant community for this site and is considered to be the Historic Climax Plant Community (HCPC). This community evolved with grazing by large herbivores and occasional prairie fires. This plant community can be found on areas that are properly managed with grazing and/or prescribed burning, and sometimes on areas receiving occasional short periods of rest. The potential vegetation is about 80% grasses or grass-like plants, 10% forbs, 7% shrubs and 1% cryptogams. The major grasses include prairie sandreed, sand bluestem, needleandthread and little bluestem. Other grasses include sideoats grama, blue grama and plains muhly. Significant forbs include gayfeather, purple coneflower, prairie clover and stiff sunflower. Significant shrubs are fringed sagewort, broom snakeweed, creeping juniper and rose. This plant community is well adapted to the Northern Great Plains climatic conditions. Individual species can vary greatly in production depending on growing conditions (timing and amount of precipitation and temperature). Community dynamics, nutrient cycle, water cycle and energy flow are functioning properly. Plant litter is properly distributed with very little movement off-site and natural plant mortality is very low. The diversity in plant species allows for high drought tolerance. Low available water capacity provides an unfavorable soil-water-plant relationship.

Table 5. Annual production by plant type

Plant Type	Low (Kg/Hectare)	Representative Value (Kg/Hectare)	High (Kg/Hectare)
Grass/Grasslike	908	1389	1866
Forb	73	118	163
Shrub/Vine	28	55	84
Moss	–	8	17
<b>Total</b>	<b>1009</b>	<b>1570</b>	<b>2130</b>

Figure 5. Plant community growth curve (percent production by month).  
ND5402, Missouri Slope, Native Grasslands, Cool/Warm-season Mix. Cool-season/warm-season dominant.

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0	0	2	6	21	40	20	6	4	1	0	0

## State 2 Sedge

### Community 2.1 Sedge

This plant community is the result of long-term, heavy, continuous grazing and/or continuous seasonal grazing (annual, early spring seasonal grazing). Threadleaf sedge dominates the community. Other grasses that have increased are blue grama, red threeawn and sand dropseed. Prairie sandreed and little bluestem have been significantly reduced. Sand bluestem and sideoats grama are mostly absent. Significant forbs include American pasqueflower, cutleaf ironplant, groundplum milkvetch, goldenrod, prairie coneflower and scarlet globemallow. There is usually less than 10% bare ground. The significant shrubs include broom snakeweed, cactus and fringed sagewort. This plant community can occur throughout the pasture, on spot grazed areas, and around water sources where season-long grazing patterns occur. Species diversity has shifted from a predominantly tall warm-season grass community to a shortgrass/grass-like plant community. Production has been significantly decreased. Energy flow, water cycle and mineral cycle have been negatively affected. Litter levels are very low and unevenly distributed. Soil erosion may be a concern on steeper slopes and exposed areas.

Table 6. Annual production by plant type

Plant Type	Low (Kg/Hectare)	Representative Value (Kg/Hectare)	High (Kg/Hectare)
Grass/Grasslike	263	448	521
Forb	50	69	90
Shrub/Vine	22	34	45
Moss	–	9	17
<b>Total</b>	<b>335</b>	<b>560</b>	<b>673</b>

Figure 7. Plant community growth curve (percent production by month). ND5408, Missouri Slope, Sedge Dominant. Cool-season, short grasses and grass-like.

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0	0	3	10	30	25	20	5	5	2	0	0

### State 3 Low Plant Density, Excessive Litter

### State 4 Club Moss

### Additional community tables

Table 7. Community 1.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production (Kg/Hectare)	Foliar Cover (%)
<b>Grass/Grasslike</b>					
1				314–471	
	prairie sandreed	CALO	<i>Calamovilfa longifolia</i>	235–392	–
	little bluestem	SCSC	<i>Schizachyrium scoparium</i>	78–235	–
	plains muhly	MUCU3	<i>Muhlenbergia cuspidata</i>	63–126	–
2	<b>Bluestem</b>			78–157	
	sand bluestem	ANHA	<i>Andropogon hallii</i>	78–157	–
3	<b>Needlegrasses</b>			78–173	
	needle and thread	HECOC8	<i>Hesperostipa comata ssp. comata</i>	78–173	–
	green needlegrass	NAVI4	<i>Nassella viridula</i>	31–63	–
4	<b>Gramma</b>			63–126	
	blue grama	BOGR2	<i>Bouteloua gracilis</i>	47–110	–
	hairy grama	BOHI2	<i>Bouteloua hirsuta</i>	16–78	–
5	<b>Other Native Grasses</b>			78–157	
	sideoats grama	BOCU	<i>Bouteloua curtipendula</i>	31–63	–
	western wheatgrass	PASM	<i>Pascopyrum smithii</i>	31–63	–
	thickspike wheatgrass	ELLAL	<i>Elymus lanceolatus ssp. lanceolatus</i>	0–47	–
	prairie Junegrass	KOMA	<i>Koeleria macrantha</i>	16–31	–
	bluebunch wheatgrass	PSSP6	<i>Pseudoroegneria spicata</i>	0–31	–
	sand dropseed	SPCR	<i>Sporobolus cryptandrus</i>	16–31	–
	Grass, perennial	2GP	<i>Grass, perennial</i>	16–31	–
	Fendler threeawn	ARPUL	<i>Aristida purpurea var. longiseta</i>	16–31	–



	plains reedgrass	CAMU	<i>Calamagrostis montanensis</i>	0–16	–
	Scribner's rosette grass	DIOLS	<i>Dichanthelium oligosanthes</i> var. <i>scribnerianum</i>	16	–
6	<b>Grass-Likes</b>			78–235	
	threadleaf sedge	CAFI	<i>Carex filifolia</i>	47–157	–
	sun sedge	CAINH2	<i>Carex inops</i> ssp. <i>heliophila</i>	31–78	–
	Grass-like (not a true grass)	2GL	<i>Grass-like (not a true grass)</i>	0–47	–
	Pennsylvania sedge	CAPE6	<i>Carex pennsylvanica</i>	16	–
<b>Forb</b>					
8	<b>Forbs</b>			78–157	
	prairie clover	DALEA	<i>Dalea</i>	31–47	–
	blacksamson echinacea	ECAN2	<i>Echinacea angustifolia</i>	16–31	–
	stiff sunflower	HEPA19	<i>Helianthus pauciflorus</i>	16–31	–
	blazing star	LIATR	<i>Liatris</i>	16–31	–
	tarragon	ARDR4	<i>Artemisia dracunculus</i>	16–31	–
	purple locoweed	OXLA3	<i>Oxytropis lambertii</i>	16–31	–
	goldenrod	SOLID	<i>Solidago</i>	16–31	–
	scarlet globemallow	SPCO	<i>Sphaeralcea coccinea</i>	16	–
	spiderwort	TRADE	<i>Tradescantia</i>	16	–
	American vetch	VIAM	<i>Vicia americana</i>	16	–
	beardtongue	PENST	<i>Penstemon</i>	16	–
	spiny phlox	PHHO	<i>Phlox hoodii</i>	16	–
	cinquefoil	POTEN	<i>Potentilla</i>	16	–
	scurfpea	PSORA2	<i>Psoralegium</i>	16	–
	eastern pasqueflower	PUPA5	<i>Pulsatilla patens</i>	0–16	–
	upright prairie coneflower	RACO3	<i>Ratibida columnifera</i>	16	–
	white sagebrush	ARLU	<i>Artemisia ludoviciana</i>	16	–
	groundplum milkvetch	ASCR2	<i>Astragalus crassicaarpus</i>	16	–
	plains milkvetch	ASG15	<i>Astragalus gilviflorus</i>	0–16	–
	wavyleaf thistle	CIUN	<i>Cirsium undulatum</i>	0–16	–
	Forb, perennial	2FP	<i>Forb, perennial</i>	0–16	–
	common yarrow	ACMI2	<i>Achillea millefolium</i>	16	–
	onion	ALLIU	<i>Allium</i>	16	–
	pussytoes	ANTEN	<i>Antennaria</i>	16	–
	rush skeletonplant	LYJU	<i>Lygodesmia juncea</i>	16	–
	lacy tansyaster	MAPI	<i>Machaeranthera pinnatifida</i>	0–16	–
	hairy false goldenaster	HEVI4	<i>Heterotheca villosa</i>	16	–
	sanddune wallflower	ERCAC	<i>Erysimum capitatum</i> var. <i>capitatum</i>	0–16	–
	blanketflower	GAAR	<i>Gaillardia aristata</i>	16	–
<b>Shrub/Vine</b>					
9	<b>Shrubs</b>			31–78	
	rose	ROSA5	<i>Rosa</i>	16–31	–
	spurred yucca	YUCC1	<i>Yucca elata</i>	0–16	–

	soapweed yucca	TUGL	<i>Yucca glauca</i>	0-16	-
	Subshrub (<.5m)	2SUBS	<i>Subshrub (&lt;.5m)</i>	0-16	-
	prairie sagewort	ARFR4	<i>Artemisia frigida</i>	16	-
	kinnikinnick	ARUV	<i>Arctostaphylos uva-ursi</i>	0-16	-
	broom snakeweed	GUSA2	<i>Gutierrezia sarothrae</i>	16	-
	creeping juniper	JUHO2	<i>Juniperus horizontalis</i>	16	-
	winterfat	KRLA2	<i>Krascheninnikovia lanata</i>	0-16	-
	pricklypear	OPUNT	<i>Opuntia</i>	16	-
	skunkbush sumac	RHTR	<i>Rhus trilobata</i>	0-16	-
<b>Moss</b>					
10	<b>Cryptogams</b>			0-16	
	lesser spikemoss	SEDE2	<i>Selaginella densa</i>	0-16	-

Table 8. Community 2.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production (Kg/Hectare)	Foliar Cover (%)
<b>Grass/Grasslike</b>					
1				6-11	
	prairie sandreed	CALO	<i>Calamovilfa longifolia</i>	6-11	-
	little bluestem	SCSC	<i>Schizachyrium scoparium</i>	6-11	-
	plains muhly	MUCU3	<i>Muhlenbergia cuspidata</i>	0-6	-
3	<b>Needlegrasses</b>			6-56	
	needle and thread	HECOC8	<i>Hesperostipa comata ssp. comata</i>	6-56	-
4	<b>Gramma</b>			28-84	
	blue grama	BOGR2	<i>Bouteloua gracilis</i>	28-84	-
	hairy grama	BOHI2	<i>Bouteloua hirsuta</i>	6-28	-
6	<b>Grass-Likes</b>			168-224	
	threadleaf sedge	CAFI	<i>Carex filifolia</i>	168-224	-
	sun sedge	CAINH2	<i>Carex inops ssp. heliophila</i>	0-28	-
	Grass-like (not a true grass)	2GL	<i>Grass-like (not a true grass)</i>	0-22	-
7	<b>Non-Native Grasses</b>			0-11	
	crested wheatgrass	AGCR	<i>Agropyron cristatum</i>	0-11	-
	cheatgrass	BRTE	<i>Bromus tectorum</i>	0-11	-
<b>Shrub/Vine</b>					
5	<b>Other Native Grasses</b>			17-39	
	sand dropseed	SPCR	<i>Sporobolus cryptandrus</i>	11-39	-
	Fendler threeawn	ARPUL	<i>Aristida purpurea var. longiseta</i>	6-28	-
	Scribner's rosette grass	DIOLS	<i>Dichanthelium oligosanthes var. scribnerianum</i>	0-6	-
	thickspike wheatgrass	ELLAL	<i>Elymus lanceolatus ssp. lanceolatus</i>	0-6	-
	prairie Junegrass	KOMA	<i>Koeleria macrantha</i>	0-6	-
	western wheatgrass	PASM	<i>Pascopyrum smithii</i>	0-6	-
	Grass, perennial	2GP	<i>Grass, perennial</i>	0-6	-
9	<b>Shrubs</b>			28-39	
	prairie sagewort	ARFR4	<i>Artemisia frigida</i>	11-17	-

	prairie sagewort	AMST	<i>Artemisia nigra</i>	11-17	-
	broom snakeweed	GUSA2	<i>Gutierrezia sarothrae</i>	11-17	-
	soapweed yucca	YUGL	<i>Yucca glauca</i>	0-17	-
	creeping juniper	JUHO2	<i>Juniperus horizontalis</i>	6-11	-
	pricklypear	OPUNT	<i>Opuntia</i>	6-11	-
	rose	ROSA5	<i>Rosa</i>	6-11	-
	Subshrub (<.5m)	2SUBS	<i>Subshrub (&lt;.5m)</i>	0-6	-
	skunkbush sumac	RHTR	<i>Rhus trilobata</i>	0-6	-
<b>Forb</b>					
8	<b>Forbs</b>			56-84	
	sweetclover	MELIL	<i>Melilotus</i>	0-28	-
	tarragon	ARDR4	<i>Artemisia dracunculus</i>	17-22	-
	lacy tansyaster	MAPI	<i>Machaeranthera pinnatifida</i>	17-22	-
	scurfpea	PSORA2	<i>Psoraleidum</i>	11-17	-
	eastern pasqueflower	PUPA5	<i>Pulsatilla patens</i>	11-17	-
	upright prairie coneflower	RACO3	<i>Ratibida columnifera</i>	11-17	-
	goldenrod	SOLID	<i>Solidago</i>	11-17	-
	scarlet globemallow	SPCO	<i>Sphaeralcea coccinea</i>	11-17	-
	Cuman ragweed	AMPS	<i>Ambrosia psilostachya</i>	6-17	-
	purple locoweed	OXLA3	<i>Oxytropis lambertii</i>	11-17	-
	wavyleaf thistle	CIUN	<i>Cirsium undulatum</i>	6-17	-
	curlycup gumweed	GRSQ	<i>Grindelia squarrosa</i>	0-17	-
	hairy false goldenaster	HEVI4	<i>Heterotheca villosa</i>	11-17	-
	Canadian horseweed	COCA5	<i>Conyza canadensis</i>	0-11	-
	spiny phlox	PHHO	<i>Phlox hoodii</i>	6-11	-
	pussytoes	ANTEN	<i>Antennaria</i>	6-11	-
	common yarrow	ACMI2	<i>Achillea millefolium</i>	6-11	-
	common dandelion	TAOF	<i>Taraxacum officinale</i>	6-11	-
	yellow salsify	TRDU	<i>Tragopogon dubius</i>	6-11	-
	rush skeletonplant	LYJU	<i>Lygodesmia juncea</i>	6-11	-
	American vetch	VIAM	<i>Vicia americana</i>	0-6	-
	onion	ALLIU	<i>Allium</i>	6	-
	Forb, annual	2FA	<i>Forb, annual</i>	6	-
	Forb, perennial	2FP	<i>Forb, perennial</i>	6	-
	white sagebrush	ARLU	<i>Artemisia ludoviciana</i>	0-6	-
	plains milkvetch	ASGI5	<i>Astragalus gilviflorus</i>	0-6	-
	woolly plantain	PLPA2	<i>Plantago patagonica</i>	6	-
	cinquefoil	POTEN	<i>Potentilla</i>	0-6	-
	blacksamson echinacea	ECAN2	<i>Echinacea angustifolia</i>	6	-
	blazing star	LIATR	<i>Liatris</i>	0-6	-
<b>Moss</b>					
10	<b>Cryptogams</b>			6-11	
	lesser spikemoss	SEDE2	<i>Selaginella densa</i>	6-11	-

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## **Animal community**

Animal Community – Wildlife Interpretations:  
Under development.

Animal Community – Grazing Interpretations:

This site is well adapted to managed grazing by domestic livestock. The predominance of herbaceous plants across all plant community phases best lends these sites to grazing by cattle but other domestic grazers with differing diet preferences may also be a consideration depending upon management objectives. Often, the current plant community does not entirely match any particular plant community (as described in the ecological site description). Because of this, a resource inventory is necessary to document plant composition and production. Proper interpretation of this inventory data will permit the establishment of a safe, initial stocking rate for the type and class of animals and level of grazing management. More accurate stocking rate estimates should eventually be calculated using actual stocking rate information and monitoring data.

## **Hydrological functions**

Water is the principal factor limiting herbage production on this site. The site is dominated by soils in hydrologic groups D and B. Infiltration varies from moderate to rapid and runoff potential varies from low to medium depending on soil hydrologic group and ground cover. In many cases, areas with greater than 75% ground cover have the greatest potential for high infiltration and lower runoff. An exception would be where short grasses form a dense sod and dominate. Areas where ground cover is less than 50% have the greatest potential to have reduced infiltration and higher runoff (refer to Section 4, NRCS National Engineering Handbook for runoff quantities and hydrologic curves).

## **Recreational uses**

This site provides hunting 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 and other inventory data. Also, field knowledge of range-trained personnel was used. All descriptions were peer reviewed and/or field tested by various private, state and federal agency specialist.

Those involved in developing this site description include: Dennis Froemke, NRCS Range Management Specialist; Jeff Printz, NRCS State Range Management Specialist; Stan Boltz, NRCS Range Management Specialist; Darrell Vanderbusch, NRCS Resource Soil Scientist; L. Michael Stirling, NRCS Range Management Specialist; Dean Chamrad, NRCS State Range Management Specialist; David Dewald, NRCS State Biologist; and Brad Podoll, NRCS Biologist.

Data Source Number of Records Sample Period State County  
SCS-RANGE-417 10 1968 – 1986 ND Adams, Grant, Slope  
Ocular estimate 5 2000 – 2001 ND Bowman, Dunn,

## **Other references**

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

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

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

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

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

USDA, NRCS, Various Published Soil Surveys.

## Contributors

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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	05/24/2011
Approved by	Jeff Printz
Approval date	
Composition (Indicators 10 and 12) based on	Annual Production

## Indicators

- 1. Number and extent of rills:** Due to the wide slope range associated with this site, the number and extent of rills will vary from none on sites with slopes of < 9% to common on slopes > 25%.

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- 2. Presence of water flow patterns:** Due to the wide slope range associated with this site, water flow patterns will vary from barely observable on sites with slopes of < 9% from broken and irregular in appearance to continuous on slopes > 25%.

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- 3. Number and height of erosional pedestals or terracettes:** Not evident on slopes < 9%. Erosional pedestals will be present with terracettes present at debris dams on slopes > 9%.

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- 4. Bare ground from Ecological Site Description or other studies (rock, litter, lichen, moss, plant canopy are not bare ground):** Bare ground is 25 to 40%.

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- 5. Number of gullies and erosion associated with gullies:** Active gullies restricted to concentrated water flow patterns on steeper slopes.

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6. **Extent of wind scoured, blowouts and/or depositional areas:** None.
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7. **Amount of litter movement (describe size and distance expected to travel):** Little to no plant litter movement occurs on slopes < 9%. Litter movement does occur on slopes > 25%.
- 
8. **Soil surface (top few mm) resistance to erosion (stability values are averages - most sites will show a range of values):** Plant cover and litter is at 60% or greater of soil surface and maintains soil surface integrity. Stability class anticipated to be 5 or greater.
- 
9. **Soil surface structure and SOM content (include type of structure and A-horizon color and thickness):** Use soil series description for depth, color and structure of A-horizon.
- 
10. **Effect of community phase composition (relative proportion of different functional groups) and spatial distribution on infiltration and runoff:** Plant canopy (40% maximum), moderate to moderately slow rates.
- 
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 would be expected except for the naturally occurring rooting restriction occurring at 10 to 20 inches.
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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 rhizomatous grasses >
- Sub-dominant: Mid, warm-season bunchgrasses = mid, cool-season grasses >
- Other: grass-likes > forbs > short, warm-season grass > shrubs > short, cool-season grasses
- Additional: Due to differing root structure and distribution, Kentucky bluegrass and smooth brome grass do not fit into reference plant community F/S groups.
- 
13. **Amount of plant mortality and decadence (include which functional groups are expected to show mortality or decadence):** Some plant mortality and decadence would be expected (5 – 10%).
- 
14. **Average percent litter cover (%) and depth ( in):** Litter cover is in contact with soil surface.
- 
15. **Expected annual annual-production (this is TOTAL above-ground annual-production, not just forage annual-production):** Representative value = 1400 lbs/ac with a range of 900 lbs/ac to 1900 lbs/ac (air dry weight) depending upon growing conditions.

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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, Kentucky bluegrass, smooth brome grass, creeping juniper (JUHO2)
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17. **Perennial plant reproductive capability:** Not limited.
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