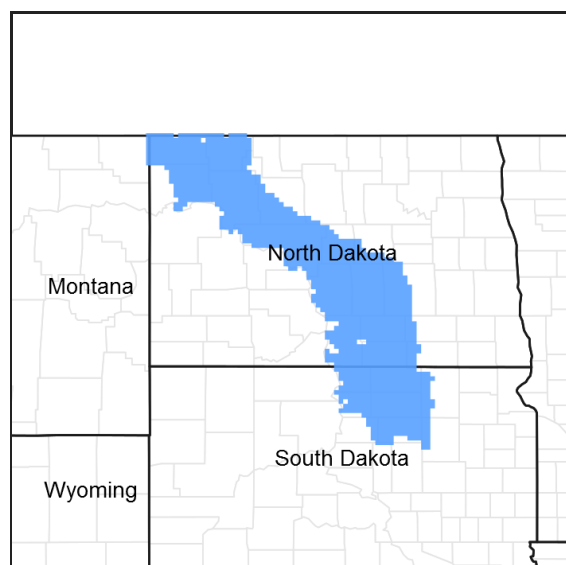


## **Ecological site R053BY010ND** **Shallow Gravel**

Last updated: 1/11/2024  
 Accessed: 05/13/2025

### **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: 42a – Missouri Coteau; 42b – Collapsed Glacial Outwash; 42c – Missouri Coteau Slope; 42d – Northern Missouri Coteau; 42f – Southern Missouri Coteau Slope; 42g – Ponca Plains; and 42h – Southern River Breaks.

### **Associated sites**

R053BY008ND	<b>Sandy</b>
R053BY011ND	<b>Loamy</b>
R053BY017ND	<b>Very Shallow</b>

### **Similar sites**

R053BY017ND	<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 loamy site. Indicator species are blue grama, sideoats grama, purple coneflower, pasqueflower and creeping juniper. This site has similar species but more needleandthread, blue grama and less plains muhly, green needlegrass, western wheatgrass, restrictive layer above 10 inches is scoria or gravels, less production.]
-------------	--

**Table 1. Dominant plant species**

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

## Physiographic features

This site occurs on stream terraces and uplands where gravelly sediments are deposited.

**Table 2. Representative physiographic features**

Landforms	(1) Outwash plain (2) Terrace (3) Beach ridge
Flooding frequency	None
Ponding frequency	None
Elevation	488–610 m
Slope	0–9%
Water table depth	203 cm
Aspect	Aspect is not a significant factor

## Climatic features

MLRA 53B 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 15 to 20 inches per year. The normal average annual temperature is about 41° F. January is the coldest month with average temperatures ranging from about 4° F (Powers Lake, ND) to about 10° F (Pollock, SD). July is the warmest month with temperatures averaging from about 67° F (Powers Lake, ND) to about 72° F (Pollock, SD). The range of normal average monthly temperatures between the coldest and warmest months is about 62° F. This large annual range attests to the continental nature of this MLRA's climate. Winds average about 11 miles per hour annually, ranging from about 13 miles per hour during the spring to about 10 miles per hour during the summer. Daytime winds are generally stronger than nighttime and occasional strong storms may bring brief periods of high winds with gusts to more than 50 miles per hour.

Growth of 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)	135 days
Freeze-free period (average)	156 days
Precipitation total (average)	508 mm

## Influencing water features

No significant water features influence this site.

## Soil features

These soils are very deep and well to somewhat excessively drained. Soil textures include moderately coarse and medium textured soils over sand or sand and gravel between the depths of 14 to 25 inches. Saturated hydraulic conductivity is moderately rapid to moderate in the upper part and very rapid in the lower part. Available water capacity is moderate in the upper part and low to very low in the lower part. Salinity and sodicity are none. This site occurs on flats, rises, and side slopes on outwash plains and terraces. Slope ranges from 0 to 9 percent. Runoff as evidenced by patterns of rill, gully or other water flow is negligible to low, in spite of the slopes, due to the very high intake rate of these soils. Some pedestalling of plants occurs, but it is not very evident on casual observation and occurs on less than 5% of the plants.

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:

<http://www.nrcs.usda.gov/technical/efotg/>

**Table 4. Representative soil features**

Surface texture	(1) Loam
Family particle size	(1) Sandy
Drainage class	Well drained to somewhat excessively drained
Permeability class	Moderate to moderately rapid
Soil depth	203 cm
Surface fragment cover <=3"	0–15%
Surface fragment cover >3"	0%
Available water capacity (0-101.6cm)	10.16–12.7 cm
Calcium carbonate equivalent (0-101.6cm)	0–20%
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)	10–60%
Subsurface fragment volume >3" (Depth not specified)	0–25%

## Ecological dynamics

The 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 moderately resilient. Under continued adverse impacts, a decline in vegetative vigor and composition will occur. Under favorable vegetative management treatments the site can return to the Historic Climax Plant Community (HCPC).

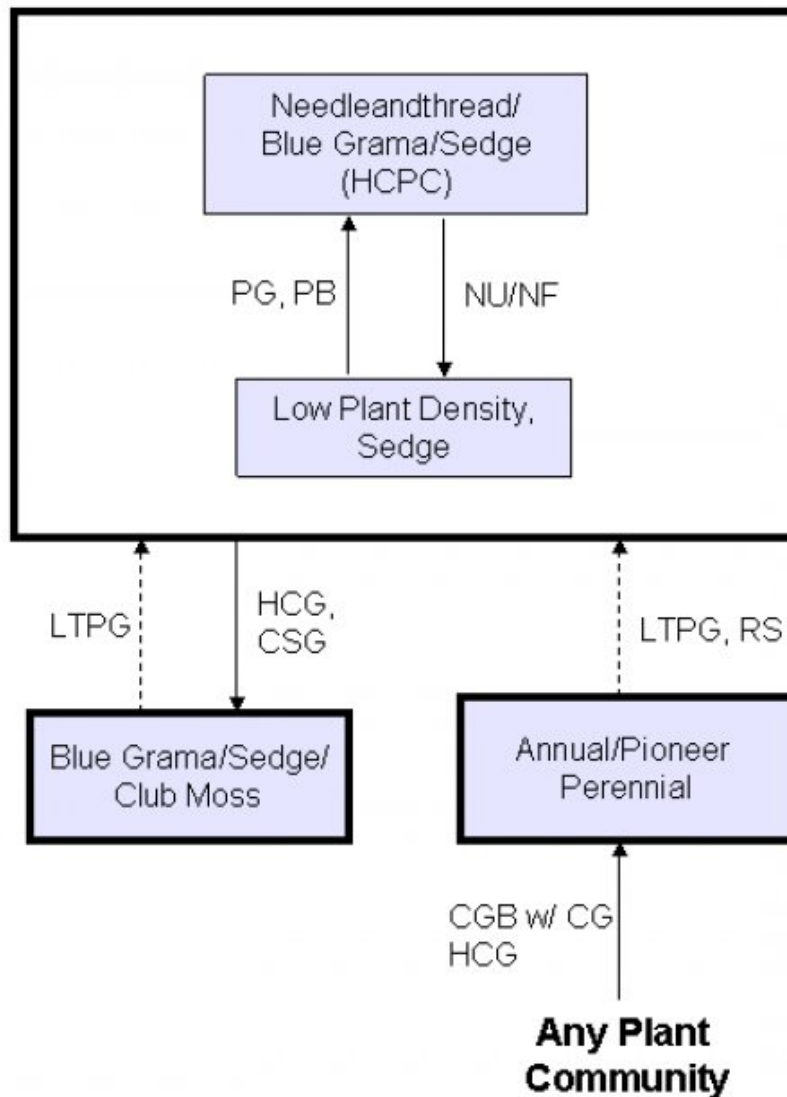
The plant community upon which interpretations are primarily based is the Historic Climax Plant Community. The HCPC has been determined by study of rangeland relic areas, areas protected from excessive disturbance, and areas under long-term rotational grazing regimes. Trends in plant community dynamics 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.

As this site deteriorates, species such as blue grama, sand dropseed, red threeawn and club moss will increase. Grasses such as little bluestem, needleandthread, green needlegrass and western wheatgrass will decrease in frequency and production. Perennial forbs increase under poor management, and if management persists, annual forbs and shrubs will also increase as grasses decrease.

This site is extremely responsive to high moisture years when additional moisture is received during the growing season. The associated coarse textured soils have low moisture holding capability, which generally limits plant growth. With additional moisture, the interpretive plant community can significantly increase its production when compared to the production of a normal year.

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**



**CGB w/ CG** – Cropped go-back with continuous grazing; **CSG** – Continuous seasonal grazing; **HCG** – Heavy continuous grazing; **HCPC** – Historical Climax Plant Community; **LTPG** – Long-term prescribed grazing; **NU/NF** – Extended period of non-use & no fire; **PB** – Prescribed burning; **PG** – Prescribed grazing; **RS** – Range seeding followed by prescribed grazing.

**State 1**  
**Needleandthread/Blue Grama/Sedge (HCPC)**

# Community 1.1 Needleandthread/Blue Grama/Sedge (HCPC)

This is the interpretive plant community and is considered to be the Historic Climax Plant Community (HCPC). This community evolved with grazing by large herbivores and occasional prairie fire. It is well suited for grazing by domestic livestock and can be found on areas that are properly managed with prescribed grazing that allows for proper utilization, changes in season of use and adequate recovery periods following each grazing event. The potential vegetation is about 89% grasses or grass-like plants, 5% forbs, 5% shrubs and 1% cryptogams. The major grasses & grass-likes include needleandthread, blue grama, western wheatgrass, green needlegrass, porcupine grass, plains muhly and sedge. Other grasses occurring on this plant community include sand dropseed, prairie junegrass, little bluestem and prairie dropseed. This plant community is well adapted to the Northern Great Plains climatic conditions. The diversity in plant species allows for high drought tolerance. This is a healthy and 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	829	1659	2141
Forb	34	63	95
Shrub/Vine	34	63	95
Moss	–	9	22
Total	897	1794	2353

Figure 5. Plant community growth curve (percent production by month).  
ND5303, Missouri Coteau, cool-season/warm-season co-dominant.. Cool-season, warm-season co-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 Blue Grama/Sedge/Club Moss

### Community 2.1 Blue Grama/Sedge/Club Moss

This is the interpretive plant community and is considered to be the Historic Climax Plant Community (HCPC). This community evolved with grazing by large herbivores and occasional prairie fire. It is well suited for grazing by domestic livestock and can be found on areas that are properly managed with prescribed grazing that allows for proper utilization, changes in season of use and adequate recovery periods following each grazing event. The potential vegetation is about 89% grasses or grass-like plants, 5% forbs, 5% shrubs and 1% cryptogams. The major grasses & grass-likes include needleandthread, blue grama, western wheatgrass, green needlegrass, porcupine grass, plains muhly and sedge. Other grasses occurring on this plant community include sand dropseed, prairie junegrass, little bluestem and prairie dropseed. This plant community is well adapted to the Northern Great Plains climatic conditions. The diversity in plant species allows for high drought tolerance. This is a healthy and sustainable plant community (site/soil stability, watershed function, and biologic integrity).

Table 6. Annual production by plant type

Plant Type	Low (Kg/Hectare)	Representative Value (Kg/Hectare)	High (Kg/Hectare)
Grass/Grasslike	353	708	1283
Moss	17	54	95
Shrub/Vine	39	67	95
Forb	39	67	95
<b>Total</b>	<b>448</b>	<b>896</b>	<b>1568</b>

Figure 7. Plant community growth curve (percent production by month).  
ND5305, Missouri Coteau, warm-season dominant.. Warm-season dominant..

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0	0	1	4	18	36	29	10	2	0	0	0

### State 3 Low Plant Density, Sedge

#### Community 3.1 Low Plant Density, Sedge

This plant community develops after an extended period of 15 or more years of non-use by herbivores and exclusion of fire. This plant community is dispersed throughout the pasture, encircling spot grazed areas, and areas distant from water sources. This is a typical pattern found in properly stocked pastures grazed season-long. Plant litter may accumulate as this plant community first develops. Due to a lack of tiller stimulation and sunlight, native bunchgrasses typically develop dead centers and native rhizomatous grasses are limited to colonies. Standing decadent plants and moderate litter covers shorter understory species (i.e. short grasses and sedges), restricting their ability to capture adequate sunlight for photosynthesis. Vigor and diversity of native plants are reduced. Annual and/or biennial forbs and annual grasses commonly fill interspaces once occupied by desirable species. Initially, species such as sedge, sand dropseed and threeawn will dominate this plant community. Eventually, species such as Kentucky bluegrass, smooth brome grass, cheatgrass and sweetclover tend to invade and may dominate this plant community. Other grasses present include western wheatgrass, needleandthread, and green needlegrass. The common forbs include green sagewort, cudweed and heath aster. Fringed sagewort and brome snakeweed are the principal shrubs. This plant community is resistant to change without prescribed grazing or fire. The combination of both grazing and fire is most effective in moving this plant community towards the HCPC. Soil erosion is low. Runoff is similar to the HCPC. Once this plant community is reached, any of the preferred treatments can readily return the diversity and production of the site.

Table 7. Annual production by plant type

Plant Type	Low (Kg/Hectare)	Representative Value (Kg/Hectare)	High (Kg/Hectare)
Grass/Grasslike	813	1177	1536
Forb	62	101	140
Shrub/Vine	11	40	73
Moss	11	27	45
<b>Total</b>	<b>897</b>	<b>1345</b>	<b>1794</b>

Figure 9. Plant community growth curve (percent production by month).  
ND5301, Missouri Coteau, cool-season dominant.. Cool-season dominant..

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0	0	3	8	24	45	10	3	5	2	0	0

### Additional community tables

Table 8. Community 1.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production (Kg/Hectare)	Foliar Cover (%)
<b>Grass/Grasslike</b>					
1	<b>Needleandthread</b>			359–538	
	needle and thread	HECOC8	<i>Hesperostipa comata</i> ssp. <i>comata</i>	359–538	–
2	<b>Blue Grama</b>			90–233	
	blue grama	BOGR2	<i>Bouteloua gracilis</i>	90–233	–
3	<b>Western Wheatgrass</b>			90–179	
	western wheatgrass	PASM	<i>Pascopyrum smithii</i>	90–179	–
4	<b>Plains Muhly</b>			54–143	
	plains muhly	MUCU3	<i>Muhlenbergia cuspidata</i>	54–143	–
5	<b>Needlegrass</b>			54–143	
	porcupinegrass	HESP11	<i>Hesperostipa spartea</i>	54–143	–
	green needlegrass	NAVI4	<i>Nassella viridula</i>	54–143	–
6	<b>Other Native Grasses</b>			90–179	
	little bluestem	SCSC	<i>Schizachyrium scoparium</i>	18–90	–
	prairie dropseed	SPHE	<i>Sporobolus heterolepis</i>	0–54	–
	Grass, perennial	2GP	<i>Grass, perennial</i>	0–54	–
	Fendler threeawn	ARPUL	<i>Aristida purpurea</i> var. <i>longiseta</i>	18–54	–
	prairie Junegrass	KOMA	<i>Koeleria macrantha</i>	18–36	–
	sand dropseed	SPCR	<i>Sporobolus cryptandrus</i>	18–36	–
7	<b>Grass-Likes</b>			90–179	
	threadleaf sedge	CAFI	<i>Carex filifolia</i>	36–143	–
	Grass-like (not a true grass)	2GL	<i>Grass-like (not a true grass)</i>	36–90	–
<b>Forb</b>					
9	<b>Forbs</b>			36–90	
	Forb, perennial	2FP	<i>Forb, perennial</i>	18–54	–
	prairie clover	DALEA	<i>Dalea</i>	18–54	–
	goldenrod	SOLID	<i>Solidago</i>	18–54	–
	scarlet globemallow	SPCO	<i>Sphaeralcea coccinea</i>	18–36	–
	white heath aster	SYER	<i>Symphyotrichum ericoides</i>	18–36	–
	Forb, annual	2FA	<i>Forb, annual</i>	0–36	–
	upright prairie coneflower	RACO3	<i>Ratibida columnifera</i>	18–36	–
	lacy tansyaster	MAPI	<i>Machaeranthera pinnatifida</i>	18–36	–
	scurfpea	PSORA2	<i>Psoraleidum</i>	18–36	–
	blacksamson echinacea	ECAN2	<i>Echinacea angustifolia</i>	18–36	–
	scarlet beeblossom	GACO5	<i>Gaura coccinea</i>	18–36	–
	blazing star	LIATR	<i>Liatris</i>	18–36	–
	tarragon	ARDR4	<i>Artemisia dracunculus</i>	18–36	–
	white sagebrush	ARLU	<i>Artemisia ludoviciana</i>	18–36	–
	milkvetch	ASTRA	<i>Astragalus</i>	0–18	–
	onion	ALLIU	<i>Allium</i>	0–18	–



	pussytoes	ANTEN	<i>Antennaria</i>	0–18	–
	rush skeletonplant	LYJU	<i>Lygodesmia juncea</i>	0–18	–
	blanketflower	GAAR	<i>Gaillardia aristata</i>	0–18	–
	eastern pasqueflower	PUPA5	<i>Pulsatilla patens</i>	0–18	–
	spiny phlox	PHHO	<i>Phlox hoodii</i>	0–18	–
<b>Shrub/Vine</b>					
10	<b>Shrubs</b>			36–90	
	prairie sagewort	ARFR4	<i>Artemisia frigida</i>	18–36	–
	pricklypear	OPUNT	<i>Opuntia</i>	0–36	–
	rose	ROSA5	<i>Rosa</i>	18–36	–
	western snowberry	SYOC	<i>Symphoricarpos occidentalis</i>	0–18	–
	Subshrub (<.5m)	2SUBS	<i>Subshrub (&lt;.5m)</i>	0–18	–
	spinystar	ESVIV	<i>Escobaria vivipara</i> var. <i>vivipara</i>	0–18	–
	broom snakeweed	GUSA2	<i>Gutierrezia sarothrae</i>	0–18	–
<b>Moss</b>					
11	<b>Cryptogams</b>			0–18	
	lesser spikemoss	SEDE2	<i>Selaginella densa</i>	0–18	–

Table 9. Community 2.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production (Kg/Hectare)	Foliar Cover (%)
<b>Grass/Grasslike</b>					
1	<b>Needleandthread</b>			9–72	
	needle and thread	HECOC8	<i>Hesperostipa comata</i> ssp. <i>comata</i>	9–72	–
2	<b>Blue Grama</b>			45–179	
	blue grama	BOGR2	<i>Bouteloua gracilis</i>	45–179	–
3	<b>Western Wheatgrass</b>			9–45	
	western wheatgrass	PASM	<i>Pascopyrum smithii</i>	9–45	–
5	<b>Needlegrass</b>			0–36	
	porcupinegrass	HESP11	<i>Hesperostipa spartea</i>	0–36	–
	green needlegrass	NAVI4	<i>Nassella viridula</i>	0–36	–
6	<b>Other Native Grasses</b>			18–72	
	Fendler threeawn	ARPUL	<i>Aristida purpurea</i> var. <i>longiseta</i>	9–45	–
	sand dropseed	SPCR	<i>Sporobolus cryptandrus</i>	9–45	–
	Grass, perennial	2GP	<i>Grass, perennial</i>	0–27	–
	prairie Junegrass	KOMA	<i>Koeleria macrantha</i>	0–18	–
	little bluestem	SCSC	<i>Schizachyrium scoparium</i>	0–18	–
7	<b>Grass-Likes</b>			45–135	
	threadleaf sedge	CAFI	<i>Carex filifolia</i>	45–135	–
	Grass-like (not a true grass)	2GL	<i>Grass-like (not a true grass)</i>	18–54	–
8	<b>Non-Native Grasses</b>			18–90	
	Kentucky bluegrass	POPR	<i>Poa pratensis</i>	18–90	–
	smooth brome	BRIN2	<i>Bromus inermis</i>	0–54	–

	cheatgrass	BRTE	<i>Bromus tectorum</i>	0–45	–
	crested wheatgrass	AGCR	<i>Agropyron cristatum</i>	0–27	–
<b>Forb</b>					
9	<b>Forbs</b>			45–90	
	Forb, annual	2FA	<i>Forb, annual</i>	9–45	–
	Forb, perennial	2FP	<i>Forb, perennial</i>	9–45	–
	sweetclover	MELIL	<i>Melilotus</i>	0–45	–
	scurfpea	PSORA2	<i>Psoraleidum</i>	9–27	–
	goldenrod	SOLID	<i>Solidago</i>	9–27	–
	white heath aster	SYER	<i>Symphyotrichum ericoides</i>	9–27	–
	common dandelion	TAOF	<i>Taraxacum officinale</i>	9–27	–
	yellow salsify	TRDU	<i>Tragopogon dubius</i>	0–27	–
	tarragon	ARDR4	<i>Artemisia dracunculus</i>	9–27	–
	white sagebrush	ARLU	<i>Artemisia ludoviciana</i>	9–27	–
	prairie clover	DALEA	<i>Dalea</i>	9–18	–
	blacksamson echinacea	ECAN2	<i>Echinacea angustifolia</i>	0–18	–
	blazing star	LIATR	<i>Liatris</i>	9–18	–
	scarlet globemallow	SPCO	<i>Sphaeralcea coccinea</i>	9–18	–
	eastern pasqueflower	PUPA5	<i>Pulsatilla patens</i>	0–18	–
	upright prairie coneflower	RACO3	<i>Ratibida columnifera</i>	9–18	–
	lacy tansyaster	MAPI	<i>Machaeranthera pinnatifida</i>	0–18	–
	spiny phlox	PHHO	<i>Phlox hoodii</i>	0–9	–
	rush skeletonplant	LYJU	<i>Lygodesmia juncea</i>	0–9	–
	milkvetch	ASTRA	<i>Astragalus</i>	0–9	–
	pussytoes	ANTEN	<i>Antennaria</i>	0–9	–
<b>Shrub/Vine</b>					
10	<b>Shrubs</b>			45–90	
	prairie sagewort	ARFR4	<i>Artemisia frigida</i>	9–36	–
	pricklypear	OPUNT	<i>Opuntia</i>	9–36	–
	rose	ROSA5	<i>Rosa</i>	9–36	–
	western snowberry	SYOC	<i>Symphoricarpos occidentalis</i>	0–27	–
	broom snakeweed	GUSA2	<i>Gutierrezia sarothrae</i>	0–27	–
	spiny star	ESVIV	<i>Escobaria vivipara</i> var. <i>vivipara</i>	0–9	–
	Subshrub (<.5m)	2SUBS	<i>Subshrub (&lt;.5m)</i>	0–9	–
<b>Moss</b>					
11	<b>Cryptogams</b>			18–90	
	lesser spikemoss	SEDE2	<i>Selaginella densa</i>	18–90	–

Table 10. Community 3.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production (Kg/Hectare)	Foliar Cover (%)
<b>Grass/Grasslike</b>					
1	<b>Needleandthread</b>			27–161	
	needle and thread	HECOC8	<i>Hesperostipa comata</i> ssp. <i>comata</i>	27–161	–

2	<b>Blue Grama</b>			13–67	
	blue grama	BOGR2	<i>Bouteloua gracilis</i>	13–67	–
3	<b>Western Wheatgrass</b>			27–108	
	western wheatgrass	PASM	<i>Pascopyrum smithii</i>	27–108	–
4	<b>Plains Muhly</b>			0–27	
	plains muhly	MUCU3	<i>Muhlenbergia cuspidata</i>	0–27	–
5	<b>Needlegrass</b>			13–67	
	green needlegrass	NAVI4	<i>Nassella viridula</i>	13–67	–
	porcupinegrass	HESP11	<i>Hesperostipa spartea</i>	0–40	–
6	<b>Other Native Grasses</b>			67–202	
	Fendler threeawn	ARPUL	<i>Aristida purpurea</i> var. <i>longiseta</i>	27–135	–
	Grass, perennial	2GP	<i>Grass, perennial</i>	0–67	–
	sand dropseed	SPCR	<i>Sporobolus cryptandrus</i>	13–67	–
	little bluestem	SCSC	<i>Schizachyrium scoparium</i>	0–54	–
	prairie dropseed	SPHE	<i>Sporobolus heterolepis</i>	0–27	–
	prairie Junegrass	KOMA	<i>Koeleria macrantha</i>	13–27	–
7	<b>Grass-Likes</b>			135–269	
	threadleaf sedge	CAFI	<i>Carex filifolia</i>	135–269	–
	Grass-like (not a true grass)	2GL	<i>Grass-like (not a true grass)</i>	27–108	–
8	<b>Non-Native Grasses</b>			67–202	
	Kentucky bluegrass	POPR	<i>Poa pratensis</i>	67–202	–
	smooth brome	BRIN2	<i>Bromus inermis</i>	0–135	–
	cheatgrass	BRTE	<i>Bromus tectorum</i>	0–108	–
	crested wheatgrass	AGCR	<i>Agropyron cristatum</i>	0–40	–
<b>Forb</b>					
9	<b>Forbs</b>			67–135	
	sweetclover	MELIL	<i>Melilotus</i>	0–108	–
	Forb, annual	2FA	<i>Forb, annual</i>	13–67	–
	Forb, perennial	2FP	<i>Forb, perennial</i>	13–67	–
	tarragon	ARDR4	<i>Artemisia dracunculus</i>	13–67	–
	yellow salsify	TRDU	<i>Tragopogon dubius</i>	0–67	–
	white heath aster	SYER	<i>Symphyotrichum ericoides</i>	13–54	–
	common dandelion	TAOF	<i>Taraxacum officinale</i>	13–54	–
	white sagebrush	ARLU	<i>Artemisia ludoviciana</i>	13–54	–
	scurfpea	PSORA2	<i>Psoraleidum</i>	13–40	–
	goldenrod	SOLID	<i>Solidago</i>	13–40	–
	scarlet globemallow	SPCO	<i>Sphaeralcea coccinea</i>	13–27	–
	blazing star	LIATR	<i>Liatris</i>	13–27	–
	upright prairie coneflower	RACO3	<i>Ratibida columnifera</i>	13–27	–
	rush skeletonplant	LYJU	<i>Lygodesmia juncea</i>	0–13	–
	lacy tansyaster	MAPI	<i>Machaeranthera pinnatifida</i>	0–13	–
	spiny phlox	PHHO	<i>Phlox hoodii</i>	0–13	–
	eastern pasqueflower	PUPA5	<i>Pulsatilla patens</i>	0–13	–

	milkvetch	ASTRA	<i>Astragalus</i>	0–13	–
	prairie clover	DALEA	<i>Dalea</i>	0–13	–
	blacksamson echinacea	ECAN2	<i>Echinacea angustifolia</i>	0–13	–
	blanketflower	GAAR	<i>Gaillardia aristata</i>	0–13	–
	scarlet beeblossom	GACO5	<i>Gaura coccinea</i>	0–13	–
<b>Shrub/Vine</b>					
10	<b>Shrubs</b>			13–67	
	prairie sagewort	ARFR4	<i>Artemisia frigida</i>	13–40	–
	pricklypear	OPUNT	<i>Opuntia</i>	0–40	–
	rose	ROSA5	<i>Rosa</i>	13–40	–
	western snowberry	SYOC	<i>Symphoricarpos occidentalis</i>	0–40	–
	broom snakeweed	GUSA2	<i>Gutierrezia sarothrae</i>	0–27	–
	spiny star	ESVIV	<i>Escobaria vivipara</i> var. <i>vivipara</i>	0–13	–
	Subshrub (<.5m)	2SUBS	<i>Subshrub (&lt;.5m)</i>	0–13	–
<b>Moss</b>					
11	<b>Cryptogams</b>			13–40	
	lesser spikemoss	SEDE2	<i>Selaginella densa</i>	13–40	–

## Animal community

Wildlife Interpretations:  
Under development.

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 A and B. Infiltration varies from moderately rapid to rapid and runoff potential varies from negligible to medium for this site depending on soil hydrologic group, slope and ground cover. In many cases, areas with greater than 75% ground cover have the greatest potential for high infiltration and lower runoff. An exception would be where short grasses form a dense sod and dominate the site. Areas where ground cover is less than 50% have the greatest potential to have reduced infiltration and higher runoff (refer to Section 4, NRCS National Engineering Handbook for runoff quantities and hydrologic curves).

## Recreational uses

This site provides hunting 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

None noted.

## 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 specialists. Those involved in developing this site description include: Stan Boltz, NRCS Range Management Specialist; Michael D. Brand, State Land Dept., Director Surface Management; David Dewald, NRCS State Biologist; Paul Drayton, NRCS District Conservationist; Jody Forman, NRCS Range Management Specialist; Dennis Froemke, NRCS Range Management Specialist; Jeff Printz, NRCS State Range Management Specialist; Josh Saunders, NRCS Range Management Specialist; Kevin Sedivec, Extension Rangeland Management Specialist; Darrell Vanderbusch, NRCS Resource Soil Scientist; and Lee Voigt, NRCS Range Management Specialist.

Data Source Number of Records Sample Period State County  
SCS-RANGE-417 2 1968 – 1969 ND Burke

## Other references

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

USDA, NRCS. National Water and Climate Center, 101 SW Main, Suite 1600, Portland, OR 97204-3224.  
(<http://www.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

Jeff Printz

Jeff Printz/Stam Boltz

## Approval

Suzanne Mayne-Kinney, 1/11/2024

## Rangeland health reference sheet

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

Author(s)/participant(s)	Jeff Printz, Stan Boltz, Lee Voigt, Jody Forman
Contact for lead author	Jeff.printz@nd.usda.gov 701-530-2080
Date	03/09/2012
Approved by	Suzanne Mayne-Kinney
Approval date	

## Indicators

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

---
2. **Presence of water flow patterns:** None.  

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

---
4. **Bare ground from Ecological Site Description or other studies (rock, litter, lichen, moss, plant canopy are not bare ground):** 5 to 15%.  

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

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

---
7. **Amount of litter movement (describe size and distance expected to travel):** Plant litter remains in place. Slight movement may be visible following intense thunderstorm events particularly after extended periods of below normal precipitation.  

---
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 or greater. 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):** Use soil series description for depth, color and structure of A horizon/surface layer.  

---
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 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: Mid and short cool-season bunchgrasses >

Sub-dominant: Short warm-season grasses

Other: Mid warm-season bunchgrasses = grass-likes > forbs = shrubs > cryptogam

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):** None.
- 

14. **Average percent litter cover (%) and depth ( in):** In contact with soil surface.
- 

15. **Expected annual annual-production (this is TOTAL above-ground annual-production, not just forage annual-production):** Representative value = 1600 lbs./ac with a range of 800 to 2100 lbs./ac air dry depending upon growing conditions.
- 

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
- 

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.
-