

# Ecological site R053BY004ND Limy Subirrigated

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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.

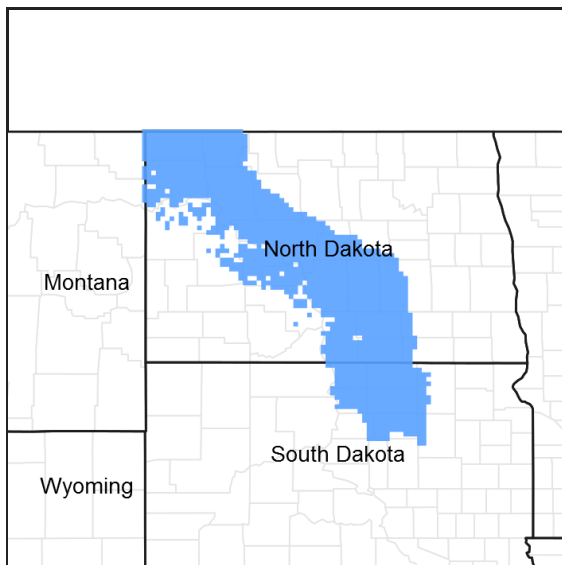


Figure 1. Mapped extent

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: 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

R053BY006ND	Saline Lowland
R053BY011ND	Loamy
R053BY012ND	Subirrigated
R053BY015ND	Thin Loamy
R053BY018ND	Linear Meadow
R053BY019ND	Wet Meadow

## Similar sites

R053BY012ND	<b>Subirrigated</b> [Less little bluestem; higher production.]
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**Table 1. Dominant plant species**

Tree	Not specified
Shrub	Not specified
Herbaceous	(1) <i>Schizachyrium scoparium</i> (2) <i>Andropogon hallii</i>

## Physiographic features

This site occurs on level, nearly level and slight rises on till plains and lake plains, and on slightly convex slopes adjacent to shallow depressions.

**Table 2. Representative physiographic features**

Landforms	(1) Lake plain (2) Till plain (3) Outwash plain
Flooding frequency	None
Ponding frequency	None
Elevation	488–610 m
Slope	0–6%
Water table depth	46–107 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

This site has a persistent water table which strongly influences the production of the site, but does not influence the species present greatly. Most of the dominant species are typical upland plants.

## Soil features

These are very deep, somewhat poorly drained, coarse to medium textured soils. These soils have a calcareous subsoil. Saturated hydraulic conductivity is moderately rapid to moderately slow and available water capacity is low to high. Salinity is none to very slight. Soils on this site are moderately to highly susceptible to wind erosion. This site is on flats and swales on lake plains, outwash plains, and till plains. Slope ranges from 0 to 6 percent. This site should show slight to no evidence of rills, wind scoured areas or pedestalled plants. No water flow paths are seen on this site. The soil surface is stable and intact. Sub-surface soil layers are non-restrictive to water movement and root penetration.

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 (2) Silt loam
Family particle size	(1) Loamy
Drainage class	Somewhat poorly drained
Permeability class	Moderately slow to moderately rapid
Soil depth	203 cm
Surface fragment cover <=3"	0–10%
Surface fragment cover >3"	0–5%
Available water capacity (0-101.6cm)	12.7–20.32 cm
Calcium carbonate equivalent (0-101.6cm)	0–45%
Electrical conductivity (0-101.6cm)	0–16 mmhos/cm
Sodium adsorption ratio (0-101.6cm)	0–3
Soil reaction (1:1 water) (0-101.6cm)	6.6–8.4
Subsurface fragment volume <=3" (Depth not specified)	0–25%
Subsurface fragment volume >3" (Depth not specified)	0–5%

## 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 slow decline in vegetative vigor and composition will occur. Under favorable vegetative management treatments the site can readily return to the Historic Climax Plant Community (HCPC).

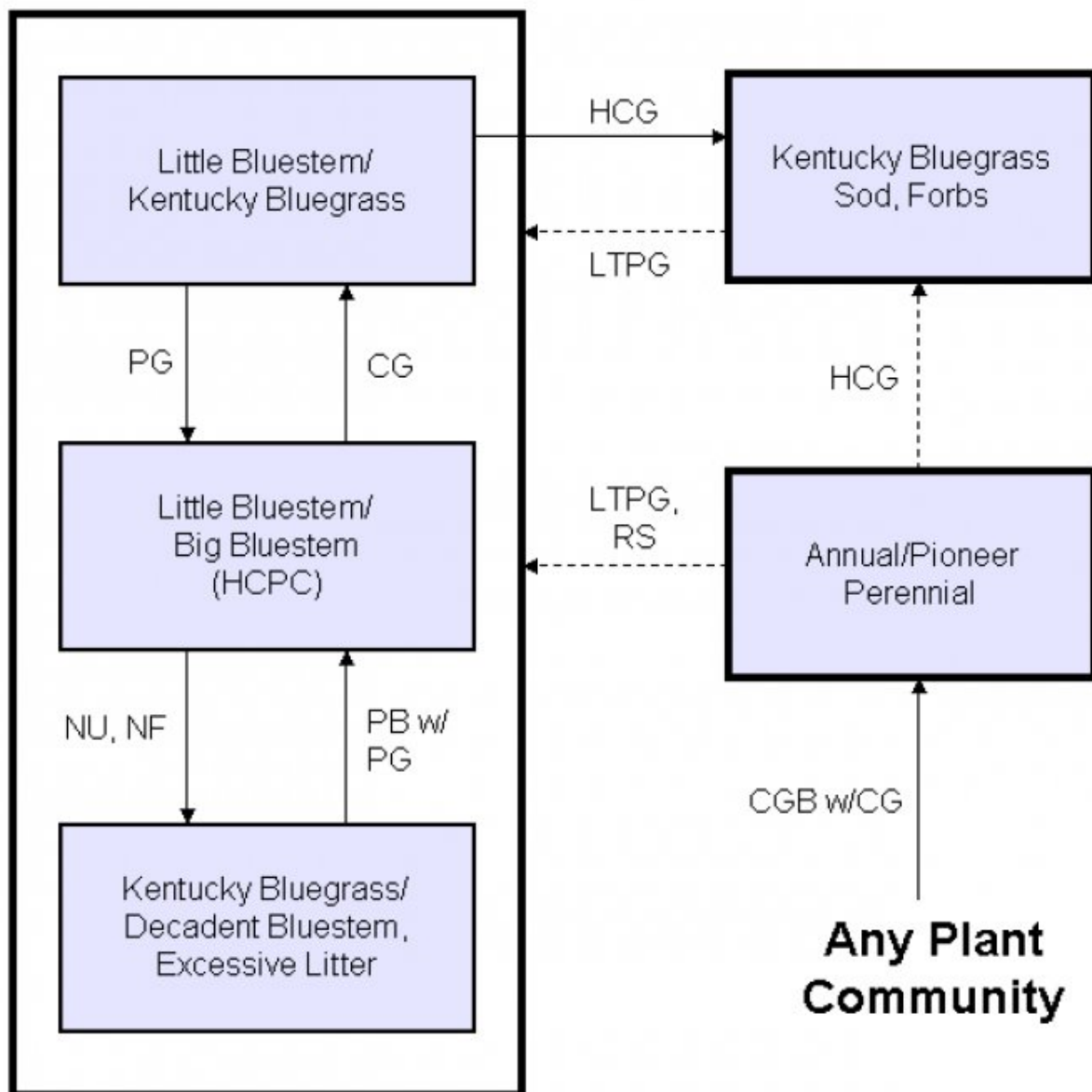
The plant community upon which interpretations are primarily based is the Historic Climax Plant Community. The HCPC has been determined by study of rangeland relic areas, areas protected from excessive disturbance, and areas under long-term rotational grazing regimes. Trends in plant community dynamics 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 and/or continuous seasonal (spring) grazing, without adequate recovery periods following each grazing occurrence causes this site to depart from the HCPC. Kentucky bluegrass will invade and increase in frequency and density. Kentucky bluegrass may eventually form into a dense sod under heavy continuous grazing. Grasses such as little bluestem, big bluestem, switchgrass and Indiangrass will decrease in frequency and production and can eventually be removed from the site. Non-use (rest) or lack of fire will cause litter levels and plant decadence/mortality to increase.

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**



**CG** – Continuous grazing without adequate recovery opportunity;  
**CGB w/CG** – Cropped go-back with continuous grazing; **HCG** - Heavy continuous grazing; **HCPC** - Historic Climax Plant Community; **LTPG** – Long-term prescribed grazing; **NU, NF** - No fire, non-use; **PB** – Prescribed burning; **PG** – Prescribed grazing with adequate recovery opportunity; **RS** – Range seeding followed by prescribed grazing.

**State 1**  
**Little Bluestem/Big Bluestem (HCPC)**

**Community 1.1**  
**Little Bluestem/Big Bluestem (HCPC)**

This is the interpretive plant community and is considered to be the Historic Climax Plant Community (HCPC). This plant community evolved with grazing by large herbivores and is well suited for grazing by domestic livestock and can be found on areas that are grazed and where the grazed plants receive adequate periods of rest during the growing season in order to recover. Historically, fires occurred infrequently. The potential vegetation is about 85% grasses and grass-like, 10% forbs, and 5% shrubs. Mid and tall warm season grasses dominate this community. The major grasses include little bluestem and big bluestem. Other secondary grasses and grass-like occurring on the community include western wheatgrass, green needlegrass, switchgrass, Indiangrass, Canada wildrye, sedges and Baltic rush. Key forbs and shrubs include American licorice, sunflower, aster, goldenrod and western snowberry. This plant community is diverse, stable, productive and is well adapted to the Northern Great Plains. The high water table supplies much of the moisture for plant growth. Plant litter is properly distributed with little movement and natural plant mortality is very low. This is a sustainable plant community in terms of 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	2864	3591	4304
Forb	196	303	420
Shrub/Vine	78	141	207
<b>Total</b>	<b>3138</b>	<b>4035</b>	<b>4931</b>

**Figure 5. Plant community growth curve (percent production by month).**  
 ND5310, Missouri Coteau, lowland warm-season dominant.. Warm-season dominant, lowland..

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0	0	0	1	28	31	25	10	3	2	0	0

**State 2**  
**Little Bluestem/Kentucky Bluegrass**

**Community 2.1**  
**Little Bluestem/Kentucky Bluegrass**

This plant community results from continuous grazing without adequate recovery periods between each grazing event during the growing season. Recognition of this plant community will enable the land user to implement key management decisions before a significant ecological threshold is crossed. Little bluestem and Kentucky bluegrass are the dominant species. Little bluestem is reduced in frequency and production compared to the HCPC, but still remains as a prominent species. Big bluestem, switchgrass, Indiangrass, green needlegrass and Canada wildrye are greatly reduced. Forb species that have increased include asters, goldenrod and cinquefoil. Native plant production and frequency have been reduced. The water cycle, nutrient cycle and energy flow is slightly reduced but continues to adequately function.

**Table 6. Annual production by plant type**

Plant Type	Low (Kg/Hectare)	Representative Value (Kg/Hectare)	High (Kg/Hectare)
Grass/Grasslike	1491	2488	3026
Forb	504	161	280
Shrub/Vine	22	40	56
<b>Total</b>	<b>2017</b>	<b>2689</b>	<b>3362</b>

Figure 7. Plant community growth curve (percent production by month).  
 ND5308, Missouri Coteau, lowland cool-season/warm-season co-dominant..  
 Cool-season, warm-season co-dominant, lowland..

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0	0	0	3	35	35	15	5	5	2	0	0

### State 3 Kentucky Bluegrass Sod, Forbs

#### Community 3.1 Kentucky Bluegrass Sod, Forbs

This plant community developed with heavy continuous grazing without adequate recovery periods between grazing events. Kentucky bluegrass dominates the community and can eventually develop into a thick sod. Baltic rush will most likely increase also. Big bluestem, switchgrass, Indiangrass, and green needlegrass have been removed. Western wheatgrass may persist in trace amounts, greatly reduced in vigor and not readily seen. Western yarrow and goldenrod have increased. Key shrubs have been severely reduced in vigor or removed completely. This plant community is resistant to change due to grazing tolerance of Kentucky bluegrass. A significant amount of production and diversity has been lost when compared to the HCPC. Loss or reduction of cool season grasses, tall warm season grasses, shrub component have negatively impacted energy flow and nutrient cycling. Water infiltration is reduced significantly due to the massive shallow root system "root pan", characteristic of sodbound Kentucky bluegrass. It will take a very long time to restore this plant community back to the HCPC with improved management. Renovation would be very costly.

Table 7. Annual production by plant type

Plant Type	Low (Kg/Hectare)	Representative Value (Kg/Hectare)	High (Kg/Hectare)
Grass/Grasslike	1334	1861	2365
Forb	219	336	476
Shrub/Vine	17	45	73
<b>Total</b>	<b>1570</b>	<b>2242</b>	<b>2914</b>

Figure 9. Plant community growth curve (percent production by month).  
 ND5306, Missouri Coteau, lowland cool-season dominant.. Cool-season  
 dominant, lowland..

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0	0	3	10	37	35	5	2	8	0	0	0

### State 4 Kentucky Bluegrass/Decadent Bluestem, Excessive Litter

#### Community 4.1 Kentucky Bluegrass/Decadent Bluestem, Excessive Litter

Table 8. Annual production by plant type

Plant Type	Low (Kg/Hectare)	Representative Value (Kg/Hectare)	High (Kg/Hectare)
Grass/Grasslike	2359	2860	3329
Forb	157	244	364
Shrub/Vine	62	146	230
<b>Total</b>	<b>2578</b>	<b>3250</b>	<b>3923</b>

Figure 11. Plant community growth curve (percent production by month). ND5307, Missouri Coteau, cool-season dominant, warm-season sub-dominant.. Cool-season dominant, warm-season sub-dominant, lowland..

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0	0	2	7	36	35	10	3	6	1	0	0

## Additional community tables

Table 9. Community 1.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production (Kg/Hectare)	Foliar Cover (%)
<b>Grass/Grasslike</b>					
1	<b>Tall &amp; Mid Warm-Season</b>			1614–2219	
	little bluestem	SCSC	<i>Schizachyrium scoparium</i>	1009–1412	–
	big bluestem	ANGE	<i>Andropogon gerardii</i>	404–807	–
	sideoats grama	BOCU	<i>Bouteloua curtipendula</i>	81–404	–
	switchgrass	PAVI2	<i>Panicum virgatum</i>	0–202	–
	Indiangrass	SONU2	<i>Sorghastrum nutans</i>	0–202	–
2	<b>Mid Cool-Season</b>			202–605	
	porcupinegrass	HESP11	<i>Hesperostipa spartea</i>	81–404	–
	green needlegrass	NAVI4	<i>Nassella viridula</i>	81–404	–
	western wheatgrass	PASM	<i>Pascopyrum smithii</i>	81–404	–
3	<b>Other Native Grasses</b>			121–202	
	blue grama	BOGR2	<i>Bouteloua gracilis</i>	40–202	–
	slender wheatgrass	ELTR7	<i>Elymus trachycaulus</i>	40–202	–
	fowl bluegrass	POPA2	<i>Poa palustris</i>	40–81	–
	Canada wildrye	ELCA4	<i>Elymus canadensis</i>	40–81	–
	Grass, perennial	2GP	<i>Grass, perennial</i>	0–81	–
4	<b>Grass-Likes</b>			202–404	
	sedge	CAREX	<i>Carex</i>	202–404	–
	Grass-like (not a true grass)	2GL	<i>Grass-like (not a true grass)</i>	40–161	–
<b>Forb</b>					
6	<b>Forbs</b>			202–404	
	Forb, perennial	2FP	<i>Forb, perennial</i>	0–121	–
	western yarrow	ACMIO	<i>Achillea millefolium var. occidentalis</i>	0–81	–
	dogbane	APOCY	<i>Apocynum</i>	40–81	–
	aster	ASTER	<i>Aster</i>	40–81	–
	American licorice	GLLE3	<i>Glycyrrhiza lepidota</i>	40–81	–



	Maximilian sunflower	HEMA2	<i>Helianthus maximiliani</i>	40–81	–
	stiff sunflower	HEPA19	<i>Helianthus pauciflorus</i>	40–81	–
	goldenrod	SOLID	<i>Solidago</i>	40–81	–
	wood lily	LIPH	<i>Lilium philadelphicum</i>	0–40	–
	mint	MENTH	<i>Mentha</i>	0–40	–
	cinquefoil	POTEN	<i>Potentilla</i>	0–40	–
	Flodman's thistle	CIFL	<i>Cirsium flodmanii</i>	0–40	–
	northern bedstraw	GABO2	<i>Galium boreale</i>	0–40	–
	anemone	ANEMO	<i>Anemone</i>	0–40	–

#### Shrub/Vine

7	<b>Shrubs</b>			81–202	
	western snowberry	SYOC	<i>Symphoricarpos occidentalis</i>	40–121	–
	Subshrub (<.5m)	2SUBS	<i>Subshrub (&lt;.5m)</i>	0–81	–
	redosier dogwood	COSE16	<i>Cornus sericea</i>	40–81	–
	chokecherry	PRVI	<i>Prunus virginiana</i>	0–81	–

Table 10. Community 2.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production (Kg/Hectare)	Foliar Cover (%)
<b>Grass/Grasslike</b>					
1	<b>Tall &amp; Mid Warm-Season</b>			673–942	
	little bluestem	SCSC	<i>Schizachyrium scoparium</i>	673–942	–
	sideoats grama	BOCU	<i>Bouteloua curtipendula</i>	0–81	–
	switchgrass	PAVI2	<i>Panicum virgatum</i>	0–27	–
	big bluestem	ANGE	<i>Andropogon gerardii</i>	0–27	–
2	<b>Mid Cool-Season</b>			27–135	
	western wheatgrass	PASM	<i>Pascopyrum smithii</i>	27–135	–
	porcupinegrass	HESP11	<i>Hesperostipa spartea</i>	0–54	–
	green needlegrass	NAVI4	<i>Nassella viridula</i>	27–54	–
3	<b>Other Native Grasses</b>			54–215	
	fowl bluegrass	POPA2	<i>Poa palustris</i>	54–215	–
	blue grama	BOGR2	<i>Bouteloua gracilis</i>	27–135	–
	Grass, perennial	2GP	<i>Grass, perennial</i>	0–54	–
	slender wheatgrass	ELTR7	<i>Elymus trachycaulus</i>	0–54	–
	Canada wildrye	ELCA4	<i>Elymus canadensis</i>	0–27	–
4	<b>Grass-Likes</b>			135–269	
	sedge	CAREX	<i>Carex</i>	54–215	–
	Grass-like (not a true grass)	2GL	<i>Grass-like (not a true grass)</i>	0–54	–
5	<b>Non-Native Grasses</b>			404–807	
	Kentucky bluegrass	POPR	<i>Poa pratensis</i>	269–807	–
	smooth brome	BRIN2	<i>Bromus inermis</i>	0–404	–
	quackgrass	ELRE4	<i>Elymus repens</i>	0–404	–
<b>Forb</b>					
6	<b>Forbs</b>			54–269	

	sweetclover	MELIL	<i>Melilotus</i>	0-215	-
	Canada thistle	CIAR4	<i>Cirsium arvense</i>	0-215	-
	Forb, annual	2FA	<i>Forb, annual</i>	0-81	-
	Forb (herbaceous, not grass nor grass-like)	2FORB	<i>Forb (herbaceous, not grass nor grass-like)</i>	0-81	-
	Forb, perennial	2FP	<i>Forb, perennial</i>	0-81	-
	western yarrow	ACMIO	<i>Achillea millefolium var. occidentalis</i>	27-81	-
	dogbane	APOCY	<i>Apocynum</i>	0-81	-
	aster	ASTER	<i>Aster</i>	27-81	-
	goldenrod	SOLID	<i>Solidago</i>	27-81	-
	common dandelion	TAOF	<i>Taraxacum officinale</i>	27-54	-
	cocklebur	XANTH2	<i>Xanthium</i>	0-54	-
	cinquefoil	POTEN	<i>Potentilla</i>	0-54	-
	Flodman's thistle	CIFL	<i>Cirsium flodmanii</i>	0-54	-
	northern bedstraw	GABO2	<i>Galium boreale</i>	0-54	-
	American licorice	GLLE3	<i>Glycyrrhiza lepidota</i>	27-54	-
	curlycup gumweed	GRSQ	<i>Grindelia squarrosa</i>	0-27	-
	mint	MENTH	<i>Mentha</i>	0-27	-
<b>Shrub/Vine</b>					
7	<b>Shrubs</b>			27-54	
	Subshrub (<.5m)	2SUBS	<i>Subshrub (&lt;.5m)</i>	0-54	-
	western snowberry	SYOC	<i>Symphoricarpos occidentalis</i>	27-54	-
	chokecherry	PRVI	<i>Prunus virginiana</i>	0-27	-

Table 11. Community 3.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production (Kg/Hectare)	Foliar Cover (%)
<b>Grass/Grasslike</b>					
1	<b>Tall &amp; Mid Warm-Season</b>			0–112	
	little bluestem	SCSC	<i>Schizachyrium scoparium</i>	0–112	–
2	<b>Mid Cool-Season</b>			22–112	
	western wheatgrass	PASM	<i>Pascopyrum smithii</i>	22–112	–
	green needlegrass	NAVI4	<i>Nassella viridula</i>	0–22	–
3	<b>Other Native Grasses</b>			67–269	
	fowl bluegrass	POPA2	<i>Poa palustris</i>	45–224	–
	blue grama	BOGR2	<i>Bouteloua gracilis</i>	22–112	–
	Grass, perennial	2GP	<i>Grass, perennial</i>	0–90	–
4	<b>Grass-Likes</b>			112–336	
	sedge	CAREX	<i>Carex</i>	112–336	–
	Grass-like (not a true grass)	2GL	<i>Grass-like (not a true grass)</i>	0–112	–
5	<b>Non-Native Grasses</b>			448–897	
	Kentucky bluegrass	POPR	<i>Poa pratensis</i>	336–785	–
	smooth brome	BRIN2	<i>Bromus inermis</i>	112–448	–
	quackgrass	ELRE4	<i>Elymus repens</i>	0–336	–
<b>Forb</b>					
6	<b>Forbs</b>			224–448	
	sweetclover	MELIL	<i>Melilotus</i>	45–224	–
	Canada thistle	CIAR4	<i>Cirsium arvense</i>	45–224	–
	aster	ASTER	<i>Aster</i>	45–112	–
	Forb, annual	2FA	<i>Forb, annual</i>	0–112	–
	Forb (herbaceous, not grass nor grass-like)	2FORB	<i>Forb (herbaceous, not grass nor grass-like)</i>	0–112	–
	Forb, perennial	2FP	<i>Forb, perennial</i>	0–112	–
	goldenrod	SOLID	<i>Solidago</i>	22–112	–
	cocklebur	XANTH2	<i>Xanthium</i>	0–112	–
	common dandelion	TAOF	<i>Taraxacum officinale</i>	45–90	–
	western yarrow	ACMIO	<i>Achillea millefolium var. occidentalis</i>	22–90	–
	dogbane	APOCY	<i>Apocynum</i>	22–67	–
	curlycup gumweed	GRSQ	<i>Grindelia squarrosa</i>	22–67	–
	Flodman's thistle	CIFL	<i>Cirsium flodmanii</i>	0–67	–
	northern bedstraw	GABO2	<i>Galium boreale</i>	0–45	–
	cinquefoil	POTEN	<i>Potentilla</i>	0–45	–
<b>Shrub/Vine</b>					
7	<b>Shrubs</b>			22–67	
	Subshrub (<.5m)	2SUBS	<i>Subshrub (&lt;.5m)</i>	0–67	–
	western snowberry	SYOC	<i>Symphoricarpos occidentalis</i>	22–67	–

Table 12. Community 4.1 plant community composition

				Annual Production	Foliar
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Group	Common Name	Symbol	Scientific Name	(Kg/Hectare)	Cover (%)
<b>Grass/Grasslike</b>					
1	<b>Tall &amp; Mid Warm-Season</b>			163–488	
	little bluestem	SCSC	<i>Schizachyrium scoparium</i>	163–488	–
	big bluestem	ANGE	<i>Andropogon gerardii</i>	0–98	–
	sideoats grama	BOCU	<i>Bouteloua curtipendula</i>	0–98	–
	switchgrass	PAVI2	<i>Panicum virgatum</i>	0–98	–
	Indiangrass	SONU2	<i>Sorghastrum nutans</i>	0–65	–
2	<b>Mid Cool-Season</b>			33–163	
	green needlegrass	NAVI4	<i>Nassella viridula</i>	33–163	–
	western wheatgrass	PASM	<i>Pascopyrum smithii</i>	33–163	–
	porcupinegrass	HESP11	<i>Hesperostipa spartea</i>	0–98	–
3	<b>Other Native Grasses</b>			65–260	
	fowl bluegrass	POPA2	<i>Poa palustris</i>	33–260	–
	Grass, perennial	2GP	<i>Grass, perennial</i>	0–163	–
	blue grama	BOGR2	<i>Bouteloua gracilis</i>	0–98	–
	slender wheatgrass	ELTR7	<i>Elymus trachycaulus</i>	33–98	–
	Canada wildrye	ELCA4	<i>Elymus canadensis</i>	33–65	–
4	<b>Grass-Likes</b>			163–488	
	sedge	CAREX	<i>Carex</i>	98–325	–
	Grass-like (not a true grass)	2GL	<i>Grass-like (not a true grass)</i>	0–163	–
5	<b>Non-Native Grasses</b>			650–1300	
	Kentucky bluegrass	POPR	<i>Poa pratensis</i>	488–1300	–
	smooth brome	BRIN2	<i>Bromus inermis</i>	163–975	–
	quackgrass	ELRE4	<i>Elymus repens</i>	65–488	–
<b>Forb</b>					
6	<b>Forbs</b>			163–325	
	Canada thistle	CIAR4	<i>Cirsium arvense</i>	0–228	–
	sweetclover	MELIL	<i>Melilotus</i>	33–228	–
	goldenrod	SOLID	<i>Solidago</i>	33–163	–
	dogbane	APOCY	<i>Apocynum</i>	33–130	–
	common dandelion	TAOF	<i>Taraxacum officinale</i>	33–98	–
	western yarrow	ACMIO	<i>Achillea millefolium var. occidentalis</i>	33–98	–
	Forb, annual	2FA	<i>Forb, annual</i>	0–65	–
	Forb (herbaceous, not grass nor grass-like)	2FORB	<i>Forb (herbaceous, not grass nor grass-like)</i>	0–65	–
	Forb, perennial	2FP	<i>Forb, perennial</i>	0–65	–
	Flodman's thistle	CIFL	<i>Cirsium flodmanii</i>	0–65	–
	northern bedstraw	GABO2	<i>Galium boreale</i>	33–65	–
	mint	MENTH	<i>Mentha</i>	0–65	–
	cinquefoil	POTEN	<i>Potentilla</i>	33–65	–
	aster	ASTER	<i>Aster</i>	33–65	–
	curlycup gumweed	GRSQ	<i>Grindelia squarrosa</i>	0–65	–
	Maximilian sunflower	HEMA2	<i>Helianthus maximiliani</i>	0–33	–

	stiff sunflower	HEPA19	<i>Helianthus pauciflorus</i>	0–33	–
	cocklebur	XANTH2	<i>Xanthium</i>	0–33	–
	American licorice	GLLE3	<i>Glycyrrhiza lepidota</i>	0–33	–
	anemone	ANEMO	<i>Anemone</i>	0–33	–
<b>Shrub/Vine</b>					
7	<b>Shrubs</b>			65–228	
	western snowberry	SYOC	<i>Symphoricarpos occidentalis</i>	65–228	–
	redosier dogwood	COSE16	<i>Cornus sericea</i>	33–98	–
	chokecherry	PRVI	<i>Prunus virginiana</i>	33–98	–
	Subshrub (<.5m)	2SUBS	<i>Subshrub (&lt;.5m)</i>	0–33	–

## 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

The site is dominated by soils in hydrologic groups B and C. Infiltration and runoff potential for this site varies from negligible to moderate 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 shortgrasses 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

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 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.

## 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/Stan 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
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Date	03/01/2012
Approved by	Suzanne Mayne-Kinney
Approval date	
Composition (Indicators 10 and 12) based on	Annual Production

## Indicators

1. **Number and extent of rills:** None.
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2. **Presence of water flow patterns:** None.
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3. **Number and height of erosional pedestals or terracettes:** None.

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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 < 5%. Patch size is < 2 inches in diameter.
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5. **Number of gullies and erosion associated with gullies:** None.
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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):** None.
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8. **Soil surface (top few mm) resistance to erosion (stability values are averages - most sites will show a range of values):** Average 6 stability rating. Soil surface fragments will typically retain structure indefinitely when dipped in distilled water.
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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.
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10. **Effect of community phase composition (relative proportion of different functional groups) and spatial distribution on infiltration and runoff:** Combination of shallow and deep rooted species (mid & tall rhizomatous and tufted perennial cool- and warm-season grasses) with fine and coarse roots positively influences infiltration.
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11. **Presence and thickness of compaction layer (usually none; describe soil profile features which may be mistaken for compaction on this site):** None.
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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: Mid, warm-season grasses > tall, warm-season grasses >
- Sub-dominant: Mid, cool-season grasses >
- Other: Grass-likes = forbs > shrubs = short, warm-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.
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13. **Amount of plant mortality and decadence (include which functional groups are expected to show mortality or decadence):** Little to no plant mortality or decadence.
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14. **Average percent litter cover (%) and depth ( in):** Plant litter is in contact with soil surface.

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15. **Expected annual annual-production (this is TOTAL above-ground annual-production, not just forage annual-production):** Representative value = 3600 lbs/ac air dry with a range of 2800 lbs/ac air dry to 4400 lbs./acre air dry 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 weeds, Kentucky bluegrass, smooth brome grass, Russian olive

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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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