USDA Natural Resources
Conservation Service

Ecological site R053BY011ND
Loamy

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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.

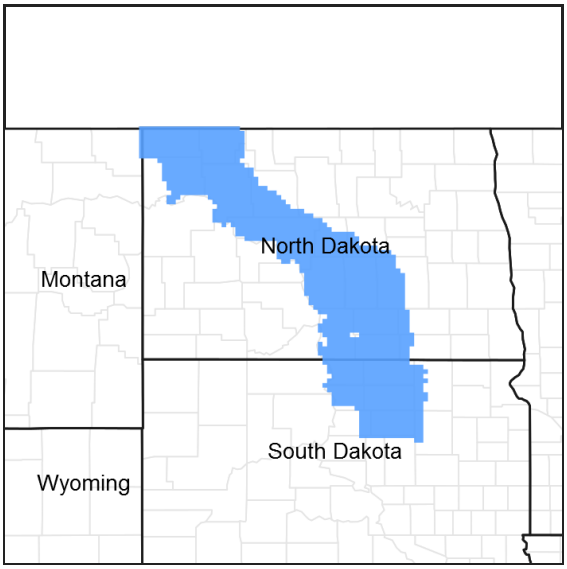


Figure 1. Mapped extent

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

R053BY001ND	**Clayey**
R053BY002ND	**Claypan**
R053BY005ND	**Loamy Overflow**
R053BY009ND	**Shallow Loamy**

Similar sites

R053BY008ND	**Sandy** [Does not receive additional moisture. Found on dry uplands upslope from Loamy Overflow sites, down slope from Shallow Loamy 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 prairie sandreed and sand bluestem; more needleandthread and sedges, less blue grama, green needlegrass and western wheatgrass, similar production, similar landscape position, different soil texture.]
R053BY002ND	**Claypan** [Well drained soils on uplands or terraces that don't receive extra moisture with a dense sodic subsoil below 6 inches with salts below 16 inches. Indicator species are western wheatgrass with an understory of blue grama, heath aster, and western yarrow along with fringed sagewort and brittle cactus. This site has less production, less green needlegrass and shrubs, more blue grama and a dense sodic subsoils layer above 20 inches.]
R053BY001ND	**Clayey** [Does not receive additional moisture. Found on dry uplands, upslope from Loamy overflow sites, down slope from Thin Loamy or Shallow Loamy sites. Similar landscape position as Sandy, Sands, and Loamy sites. Will ribbon greater than 2 inches. Indicator species: dominated by green needlegrass and western wheatgrass. This site has more green needlegrass similar production, similar landscape position and different soil texture.]

Table 1. Dominant plant species

Tree	Not specified
Shrub	Not specified
Herbaceous	(1) *Nassella viridula* (2) *Pascopyrum smithii*

Physiographic features

This site occurs on gently undulating to rolling and steep uplands.

Table 2. Representative physiographic features

Landforms	(1) Till plain (2) Terrace (3) Lake plain
Flooding frequency	None
Ponding frequency	None
Elevation	1,600–2,000 ft
Slope	1–20%
Water table depth	45–80 in
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)	20 in

Influencing water features

No significant water features influence this site.

Soil features

These are moderately deep to very deep, moderately well to well drained, medium and moderately fine textured soils. Saturated hydraulic conductivity is moderate and available water capacity is moderate to high. Salinity is none to very slight and sodicity is none. This site occurs on nearly level to hilly till plains, terraces and lake plains. Slope ranges from 1 to 20 percent. Some pedestalling of plants occurs, but it is not very evident on casual observation and occurs on less than 5% of the plants. Water flow paths are broken, irregular in appearance or discontinuous. The soil surface is stable and intact.

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 site:
http://www.nrcs.usda.gov/technical/efotg/

Table 4. Representative soil features

Surface texture	(1) Loam (2) Silt loam (3) Silty clay loam
Family particle size	(1) Loamy
Drainage class	Moderately well drained to well drained
Permeability class	Moderate
Soil depth	20–80 in
Surface fragment cover <=3"	0–25%
Surface fragment cover >3"	0–45%
Available water capacity (0-40in)	5–9 in
Calcium carbonate equivalent (0-40in)	0–30%
Electrical conductivity (0-40in)	0–4 mmhos/cm
Sodium adsorption ratio (0-40in)	0–5
Soil reaction (1:1 water) (0-40in)	6.1–8.4

Subsurface fragment volume <=3" (Depth not specified)	0–50%
Subsurface fragment volume >3" (Depth not specified)	0–20%

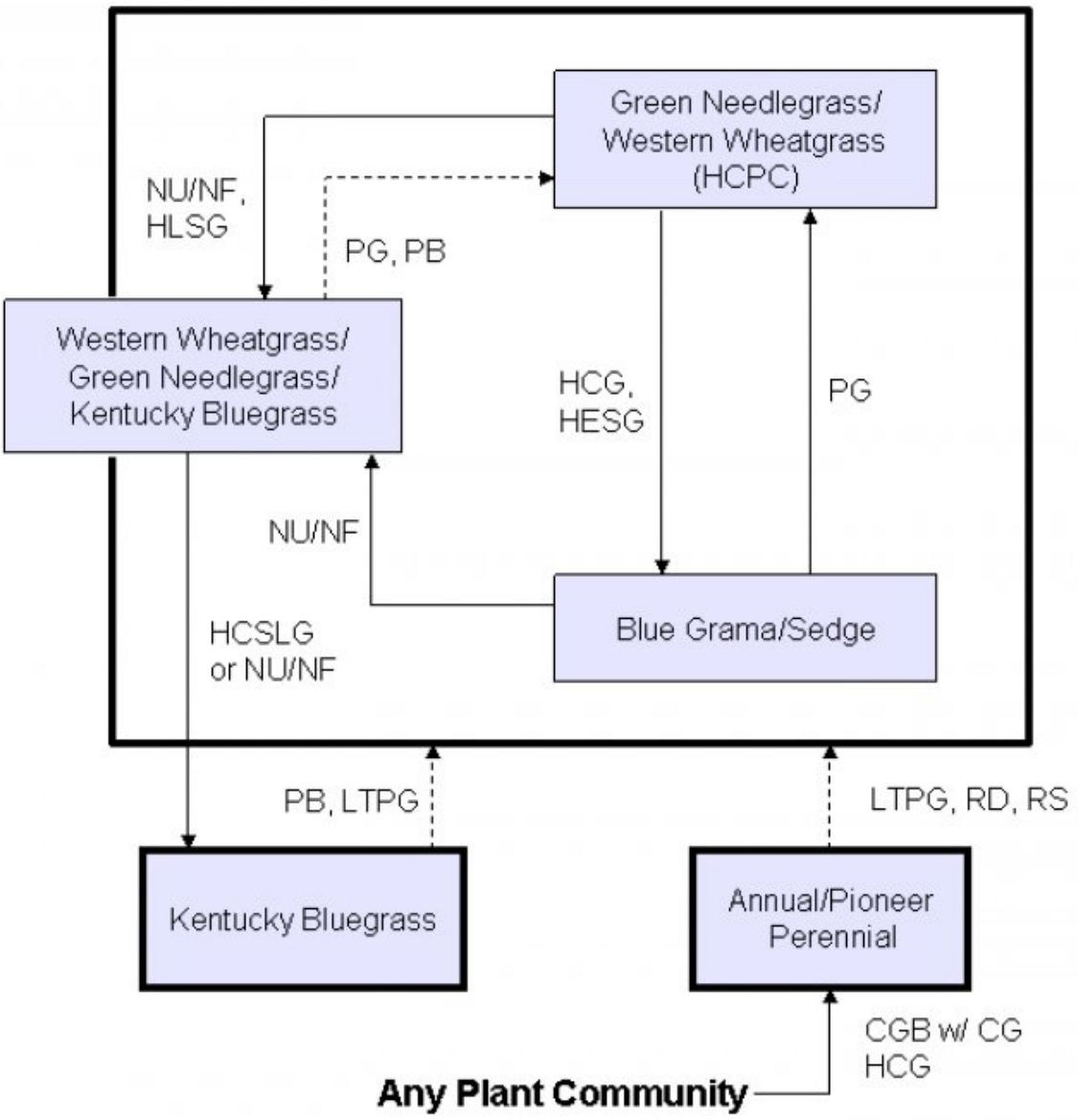
Ecological dynamics

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. Blue grama will begin to increase. Western wheatgrass will increase initially and then begin to decrease. Green needlegrass will decrease in frequency and production. In time, heavy continuous grazing will likely cause upland sedges and blue grama to dominate and pioneer perennials and annuals to increase. The resulting plant community is relatively stable and the competitive advantage prevents other species from establishing.

Extended periods of non-use and/or lack of fire will result in a plant community having high litter levels, which favors an increase in Kentucky bluegrass and/or smooth bromegrass. In time shrubs such as western snowberry and chokecherry will likely 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



CGB w/ CG – Cropped go-back with continuous grazing; **HCG** – Heavy continuous grazing; **HCPC** – Historical Climax Plant Community; **HCSLG** – Heavy continuous season-long grazing; **HESG** – Heavy early seasonal grazing; **HLSG** – Heavy late seasonal grazing; **LTPG** – Long-term prescribed grazing; **NU/NF** – Extended period of non-use & no fire; **PB** – Prescribed burning; **PG** – Prescribed grazing; **RD** – Removal of disturbance; **RS** – Range seeding with prescribed grazing.

State 1
Green Needlegrass/Western Wheatgrass (HCPC)

Community 1.1
Green Needlegrass/Western Wheatgrass (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 85% grasses or grass-like plants, 10% forbs, and 5% shrubs. The plant community is dominated by western wheatgrass and green needlegrass. Other grasses and grass-like plants include needleandthread, blue grama, porcupine grass, bearded wheatgrass and sedges. Significant forbs include American vetch, green sagewort, silverleaf scurfpea and Missouri goldenrod. In many areas western snowberry is the principal shrub and occurs in patchy mosaic. Other shrubs include prairie rose, leadplant, winterfat, and fringed sagewort. 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. Run-off from adjacent sites and moderate or high available water capacity provides a favorable soil-water-plant relationship.

Table 5. Annual production by plant type

Plant Type	Low (Lb/Acre)	Representative Value (Lb/Acre)	High (Lb/Acre)
Grass/Grasslike	1265	2148	3025
Forb	115	180	250
Shrub/Vine	20	72	125
Total	**1400**	**2400**	**3400**

Figure 5. 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

State 2
Western Wheatgrass/Green Needlegrass/Kentucky Bluegrass

Community 2.1
Western Wheatgrass/Green Needlegrass/Kentucky Bluegrass

This plant community develops after an extended period of non-use by herbivores and exclusion of fire. Non-native grasses, such as Kentucky bluegrass, crested wheatgrass, and smooth bromegrass tend to invade. Western wheatgrass and green needlegrass are still the dominant grasses in the early stages of this transition. Other grasses present include porcupine grass, slender wheatgrass, blue grama and needleandthread. The common forbs include sweetclover, green sagewort, cudweed sagewort, and American vetch. Western snowberry is the principal shrub and tends to increase in density and cover. Litter buildup reduces plant vigor and density, and native seedling recruitment declines. Due to a lack of tiller stimulation and sunlight, native bunchgrasses typically develop dead centers and native rhizomatous grasses are limited to small colonies. 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. 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, time and external resources will be needed to see any immediate recovery in diversity.

Table 6. Annual production by plant type

Plant Type	Low (Lb/Acre)	Representative Value (Lb/Acre)	High (Lb/Acre)
Grass/Grasslike	1055	1586	2105
Forb	90	190	300
Shrub/Vine	55	124	195
Total	**1200**	**1900**	**2600**

Figure 7. 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

State 3
Blue Grama/Sedge

Community 3.1
Blue Grama/Sedge

This plant community is the result of heavy, continuous grazing and/or annual, early spring seasonal grazing. Repeated spring grazing depletes stored carbohydrates, resulting in weakening and eventual death of the cool season mid-grasses. Blue grama and sedge are the dominant species. Other grasses and grass-likes include western wheatgrass, needleandthread, prairie junegrass and annual grasses. Forbs such as western ragweed, scurfpea, cudweed sagewort and scarlet globemallow may also be present. This plant community can occur throughout the pasture, on spot grazed areas, and around water sources where season-long grazing patterns occur. This plant community is less productive than the HCPC. Lack of litter and reduced plant vigor result in higher soil temperatures, poor water infiltration rates, and high evapotranspiration, which gives blue grama a competitive advantage over cool season mid-grasses.

Table 7. Annual production by plant type

Plant Type	Low (Lb/Acre)	Representative Value (Lb/Acre)	High (Lb/Acre)
Grass/Grasslike	440	865	1390
Forb	45	100	155
Shrub/Vine	15	35	55
Total	**500**	**1000**	**1600**

Figure 9. Plant community growth curve (percent production by month). ND5304, Missouri Coteau, warm-season dominant, cool-season sub-dominant.. Warm-season dominant, cool-season sub-dominant..

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0	0	1	5	20	38	25	8	3	0	0	0

State 4
Kentucky Bluegrass

Community 4.1
Kentucky Bluegrass

This plant community developed from continued heavy continuous season-long grazing without adequate recovery periods between grazing events or from continued non-use and no fire for extended periods of time. Kentucky bluegrass will tend to dominate this plant community; however, other non-native species such as smooth bromegrass and crested wheatgrass may also become prevalent. Needlegrasses, big bluestem, sideoats grama

and prairie dropseed are absent or nearly so, and other grasses and grass-likes present include western wheatgrass, red threeawn, prairie junegrass and sedge. Forbs commonly found in this plant community include green sagewort, scurfpea, and sweetclover. When this plant community is reached through extended periods of non-use and no fire, litter buildup reduces native plant vigor and density severely, and native seedling recruitment is rare. Due to a lack of tiller stimulation and sunlight, native bunchgrasses typically develop dead centers and native rhizomatous grasses are limited to small colonies. This plant community can be dispersed throughout the pasture, encircling spot grazed areas, and areas distant from water sources. This is a sometimes found in properly stocked pastures grazed season-long.

Table 8. Annual production by plant type

Plant Type	Low (Lb/Acre)	Representative Value (Lb/Acre)	High (Lb/Acre)
Grass/Grasslike	920	1305	1890
Forb	70	150	230
Shrub/Vine	10	45	80
Total	**1000**	**1500**	**2200**

Figure 11. 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 9. Community 1.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production (Lb/Acre)	Foliar Cover (%)
Grass/Grasslike					
1	**Wheatgrass**			240–480	
	western wheatgrass	PASM	*Pascopyrum smithii*	120–480	–
	slender wheatgrass	ELTR7	*Elymus trachycaulus*	120–360	–
	slender wheatgrass	ELTRS	*Elymus trachycaulus ssp. subsecundus*	48–240	–
2	**Needlegrass**			360–720	
	green needlegrass	NAVI4	*Nassella viridula*	120–480	–
	needle and thread	HECOC8	*Hesperostipa comata ssp. comata*	120–240	–
	shortbristle needle and thread	HECU9	*Hesperostipa curtiseta*	0–240	–
	porcupinegrass	HESP11	*Hesperostipa spartea*	120–240	–
3	**Short Warm-Season**			120–240	
	blue grama	BOGR2	*Bouteloua gracilis*	120–240	–
4	**Tall/Mid Warm-Season**			120–360	
	big bluestem	ANGE	*Andropogon gerardii*	48–240	–
	sideoats grama	BOCU	*Bouteloua curtipendula*	48–240	–
	little bluestem	SCSC	*Schizachyrium scoparium*	0–120	–
	prairie dropseed	SPHE	*Sporobolus heterolepis*	0–120	–
5	**Other Native Perennials**			48–120	
	plains reedgrass	CAMO	*Calamagrostis montanensis*	24–120	–
	prairie Junegrass	KOMA	*Koeleria macrantha*	24–72	–

	Grass, perennial	2GP	*Grass, perennial*	0–72	–
	Fendler threeawn	ARPUL	*Aristida purpurea var. longiseta*	0–24	–
6	**Grass-Likes**			24–120	
	Grass-like (not a true grass)	2GL	*Grass-like (not a true grass)*	24–120	–
	needleleaf sedge	CADU6	*Carex duriuscula*	24–120	–
	threadleaf sedge	CAFI	*Carex filifolia*	24–120	–
Forb					
8	**Forbs**			120–240	
	Forb (herbaceous, not grass nor grass-like)	2FORB	*Forb (herbaceous, not grass nor grass-like)*	0–120	–
	western yarrow	ACMIO	*Achillea millefolium var. occidentalis*	24–48	–
	white sagebrush	ARLU	*Artemisia ludoviciana*	24–48	–
	purple prairie clover	DAPU5	*Dalea purpurea*	24–48	–
	hairy false goldenaster	HEVI4	*Heterotheca villosa*	24–48	–
	blazing star	LIATR	*Liatris*	24–48	–
	white heath aster	SYER	*Symphyotrichum ericoides*	24–48	–
	American vetch	VIAM	*Vicia americana*	24–48	–
	silverleaf Indian breadroot	PEAR6	*Pediomelum argophyllum*	24–48	–
	upright prairie coneflower	RACO3	*Ratibida columnifera*	24–48	–
	goldenrod	SOLID	*Solidago*	0–48	–
	scarlet globemallow	SPCO	*Sphaeralcea coccinea*	0–24	–
	rush skeletonplant	LYJU	*Lygodesmia juncea*	0–24	–
	sanddune wallflower	ERCAC	*Erysimum capitatum var. capitatum*	0–24	–
	Cuman ragweed	AMPS	*Ambrosia psilostachya*	0–24	–
	tarragon	ARDR4	*Artemisia dracunculus*	0–24	–
Shrub/Vine					
9	**Shrubs**			24–120	
	western snowberry	SYOC	*Symphoricarpos occidentalis*	24–72	–
	Subshrub (<.5m)	2SUBS	*Subshrub (<.5m)*	0–48	–
	leadplant	AMCA6	*Amorpha canescens*	0–48	–
	prairie sagewort	ARFR4	*Artemisia frigida*	24–48	–
	prairie rose	ROAR3	*Rosa arkansana*	0–48	–

Table 10. Community 2.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production (Lb/Acre)	Foliar Cover (%)
Grass/Grasslike					
1	**Wheatgrass**			190–380	
	western wheatgrass	PASM	*Pascopyrum smithii*	95–380	–
	slender wheatgrass	ELTR7	*Elymus trachycaulus*	95–285	–
	slender wheatgrass	ELTRS	*Elymus trachycaulus ssp. subsecundus*	38–190	–
2	**Needlegrass**			95–285	
	needle and thread	HECOC8	*Hesperostipa comata ssp. comata*	38–190	–

			comata		
	green needlegrass	NAVI4	*Nassella viridula*	0–152	–
	shortbristle needle and thread	HECU9	*Hesperostipa curtiseta*	0–95	–
	porcupinegrass	HESP11	*Hesperostipa spartea*	0–76	–
3	**Short Warm-Season**			38–152	
	blue grama	BOGR2	*Bouteloua gracilis*	38–152	–
4	**Tall/Mid Warm-Season**			0–95	
	big bluestem	ANGE	*Andropogon gerardii*	0–95	–
	sideoats grama	BOCU	*Bouteloua curtipendula*	0–57	–
	little bluestem	SCSC	*Schizachyrium scoparium*	0–19	–
5	**Other Native Perennials**			38–95	
	Fendler threeawn	ARPUL	*Aristida purpurea var. longiseta*	19–95	–
	Grass, perennial	2GP	*Grass, perennial*	0–76	–
	plains reedgrass	CAMO	*Calamagrostis montanensis*	0–57	–
	prairie Junegrass	KOMA	*Koeleria macrantha*	19–38	–
6	**Grass-Likes**			19–133	
	needleleaf sedge	CADU6	*Carex duriuscula*	19–133	–
	threadleaf sedge	CAFI	*Carex filifolia*	19–133	–
	Grass-like (not a true grass)	2GL	*Grass-like (not a true grass)*	0–95	–
7	**Non-Native Grasses**			95–285	
	Kentucky bluegrass	POPR	*Poa pratensis*	38–285	–
	smooth brome	BRIN2	*Bromus inermis*	0–190	–
	cheatgrass	BRTE	*Bromus tectorum*	0–95	–
	crested wheatgrass	AGCR	*Agropyron cristatum*	0–95	–
Forb					
8	**Forbs**			95–285	
	sweetclover	MELIL	*Melilotus*	0–190	–
	Forb (herbaceous, not grass nor grass-like)	2FORB	*Forb (herbaceous, not grass nor grass-like)*	0–95	–
	curlycup gumweed	GRSQ	*Grindelia squarrosa*	0–57	–
	Cuman ragweed	AMPS	*Ambrosia psilostachya*	0–57	–
	tarragon	ARDR4	*Artemisia dracunculus*	19–57	–
	white sagebrush	ARLU	*Artemisia ludoviciana*	19–57	–
	silverleaf Indian breadroot	PEAR6	*Pediomelum argophyllum*	19–57	–
	goldenrod	SOLID	*Solidago*	19–57	–
	white heath aster	SYER	*Symphyotrichum ericoides*	19–57	–
	yellow salsify	TRDU	*Tragopogon dubius*	0–57	–
	upright prairie coneflower	RACO3	*Ratibida columnifera*	19–38	–
	blazing star	LIATR	*Liatris*	19–38	–
	rush skeletonplant	LYJU	*Lygodesmia juncea*	0–19	–
	American vetch	VIAM	*Vicia americana*	0–19	–
	scarlet globemallow	SPCO	*Sphaeralcea coccinea*	0–19	–
	purple prairie clover	DAPU5	*Dalea purpurea*	0–19	–
	sanddune wallflower	ERCAC	*Erysimum capitatum var. capitatum*	0–19	–

	hairy false goldenaster	HEVI4	*Heterotheca villosa*	0–19	–
	western yarrow	ACMIO	*Achillea millefolium var. occidentalis*	0–19	–
Shrub/Vine					
9	**Shrubs**			57–190	
	western snowberry	SYOC	*Symphoricarpos occidentalis*	19–152	–
	prairie sagewort	ARFR4	*Artemisia frigida*	19–95	–
	prairie rose	ROAR3	*Rosa arkansana*	19–76	–
	Subshrub (<.5m)	2SUBS	*Subshrub (<.5m)*	0–57	–

Table 11. Community 3.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production (Lb/Acre)	Foliar Cover (%)
Grass/Grasslike					
1	**Wheatgrass**			10–80	
	western wheatgrass	PASM	*Pascopyrum smithii*	10–80	–
	slender wheatgrass	ELTR7	*Elymus trachycaulus*	0–30	–
	slender wheatgrass	ELTRS	*Elymus trachycaulus ssp. subsecundus*	0–30	–
2	**Needlegrass**			10–70	
	needle and thread	HECOC8	*Hesperostipa comata ssp. comata*	10–60	–
	shortbristle needle and thread	HECU9	*Hesperostipa curtiseta*	0–30	–
	green needlegrass	NAVI4	*Nassella viridula*	0–20	–
3	**Short Warm-Season**			150–300	
	blue grama	BOGR2	*Bouteloua gracilis*	150–300	–
5	**Other Native Perennials**			30–100	
	Fendler threeawn	ARPUL	*Aristida purpurea var. longiseta*	20–100	–
	Grass, perennial	2GP	*Grass, perennial*	0–30	–
	prairie Junegrass	KOMA	*Koeleria macrantha*	10–20	–
	plains reedgrass	CAMO	*Calamagrostis montanensis*	0–10	–
6	**Grass-Likes**			100–200	
	needleleaf sedge	CADU6	*Carex duriuscula*	50–150	–
	threadleaf sedge	CAFI	*Carex filifolia*	20–100	–
	Grass-like (not a true grass)	2GL	*Grass-like (not a true grass)*	0–30	–
7	**Non-Native Grasses**			20–50	
	Kentucky bluegrass	POPR	*Poa pratensis*	10–50	–
	cheatgrass	BRTE	*Bromus tectorum*	10–40	–
	smooth brome	BRIN2	*Bromus inermis*	0–30	–
Forb					
8	**Forbs**			50–150	
	sweetclover	MELIL	*Melilotus*	0–100	–
	Forb (herbaceous, not grass nor grass-like)	2FORB	*Forb (herbaceous, not grass nor grass-like)*	0–80	–
	tarragon	ARDR4	*Artemisia dracunculus*	10–40	–
	white sagebrush	ARLU	*Artemisia ludoviciana*	10–30	–

	white sagebrush	ARLU	*Artemisia ludoviciana*	10–30	
	curlycup gumweed	GRSQ	*Grindelia squarrosa*	0–30	–
	silverleaf Indian breadroot	PEAR6	*Pediomelum argophyllum*	10–30	–
	goldenrod	SOLID	*Solidago*	10–30	–
	white heath aster	SYER	*Symphyotrichum ericoides*	10–30	–
	yellow salsify	TRDU	*Tragopogon dubius*	0–20	–
	western yarrow	ACMIO	*Achillea millefolium var. occidentalis*	0–20	–
	Cuman ragweed	AMPS	*Ambrosia psilostachya*	0–20	–
	upright prairie coneflower	RACO3	*Ratibida columnifera*	0–10	–
	blazing star	LIATR	*Liatris*	0–10	–
	rush skeletonplant	LYJU	*Lygodesmia juncea*	0–10	–
	scarlet globemallow	SPCO	*Sphaeralcea coccinea*	0–10	–
Shrub/Vine					
9	**Shrubs**			20–50	
	prairie sagewort	ARFR4	*Artemisia frigida*	10–50	–
	prairie rose	ROAR3	*Rosa arkansana*	10–40	–
	western snowberry	SYOC	*Symphoricarpos occidentalis*	0–30	–
	Subshrub (<.5m)	2SUBS	*Subshrub (<.5m)*	0–30	–

Table 12. Community 4.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production (Lb/Acre)	Foliar Cover (%)
Grass/Grasslike					
1	**Wheatgrass**			30–150	
	western wheatgrass	PASM	*Pascopyrum smithii*	30–150	–
	slender wheatgrass	ELTR7	*Elymus trachycaulus*	0–105	–
	slender wheatgrass	ELTRS	*Elymus trachycaulus ssp. subsecundus*	0–105	–
2	**Needlegrass**			15–120	
	needle and thread	HECOC8	*Hesperostipa comata ssp. comata*	15–120	–
	shortbristle needle and thread	HECU9	*Hesperostipa curtiseta*	0–60	–
	green needlegrass	NAVI4	*Nassella viridula*	0–45	–
3	**Short Warm-Season**			15–75	
	blue grama	BOGR2	*Bouteloua gracilis*	15–75	–
4	**Tall/Mid Warm-Season**			0–30	
	big bluestem	ANGE	*Andropogon gerardii*	0–30	–
	sideoats grama	BOCU	*Bouteloua curtipendula*	0–30	–
	little bluestem	SCSC	*Schizachyrium scoparium*	0–15	–
5	**Other Native Perennials**			30–120	
	Fendler threeawn	ARPUL	*Aristida purpurea var. longiseta*	15–105	–
	Grass, perennial	2GP	*Grass, perennial*	0–45	–
	prairie Junegrass	KOMA	*Koeleria macrantha*	15–30	–
	plains reedgrass	CAMO	*Calamagrostis montanensis*	0–15	–
6	**Grass-Likes**			30–105	

	needleleaf sedge	CADU6	*Carex duriuscula*	15–105	–
	threadleaf sedge	CAFI	*Carex filifolia*	15–75	–
	Grass-like (not a true grass)	2GL	*Grass-like (not a true grass)*	0–75	–
7	**Non-Native Grasses**			300–600	
	Kentucky bluegrass	POPR	*Poa pratensis*	150–525	–
	smooth brome	BRIN2	*Bromus inermis*	30–375	–
	cheatgrass	BRTE	*Bromus tectorum*	0–150	–
	crested wheatgrass	AGCR	*Agropyron cristatum*	0–150	–
Forb					
8	**Forbs**			75–225	
	sweetclover	MELIL	*Melilotus*	0–150	–
	Forb (herbaceous, not grass nor grass-like)	2FORB	*Forb (herbaceous, not grass nor grass-like)*	0–120	–
	white sagebrush	ARLU	*Artemisia ludoviciana*	15–60	–
	goldenrod	SOLID	*Solidago*	15–60	–
	white heath aster	SYER	*Symphyotrichum ericoides*	15–60	–
	yellow salsify	TRDU	*Tragopogon dubius*	0–60	–
	silverleaf Indian breadroot	PEAR6	*Pediomelum argophyllum*	15–45	–
	Cuman ragweed	AMPS	*Ambrosia psilostachya*	0–45	–
	tarragon	ARDR4	*Artemisia dracunculus*	15–45	–
	curlycup gumweed	GRSQ	*Grindelia squarrosa*	0–30	–
	blazing star	LIATR	*Liatris*	15–30	–
	rush skeletonplant	LYJU	*Lygodesmia juncea*	0–15	–
	western yarrow	ACMIO	*Achillea millefolium var. occidentalis*	0–15	–
	upright prairie coneflower	RACO3	*Ratibida columnifera*	0–15	–
	scarlet globemallow	SPCO	*Sphaeralcea coccinea*	0–15	–
Shrub/Vine					
9	**shrubs**			15–75	
	western snowberry	SYOC	*Symphoricarpos occidentalis*	0–75	–
	prairie sagewort	ARFR4	*Artemisia frigida*	15–60	–
	prairie rose	ROAR3	*Rosa arkansana*	0–45	–
	Subshrub (<.5m)	2SUBS	*Subshrub (<.5m)*	0–45	–

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 B, with localized areas in hydrologic group C. Infiltration varies from moderately slow to moderately rapid and runoff potential varies from negligible to high 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 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.

Data Source Number of Records Sample Period State County
SCS-RANGE-417 7 1968 – 1969 ND Burke, Emmons, Ward

Other references

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Contributors

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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.

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Date	01/11/2012
Approved by	Suzanne Mayne-Kinney
Approval date	
Composition (Indicators 10 and 12) based on	Annual Production

Indicators

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

2. **Presence of water flow patterns:** Not present. May be visible as short and discontinuous following periods of drought on slopes greater than 15%.

3. **Number and height of erosional pedestals or terracettes:** Not present.

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

5. **Number of gullies and erosion associated with gullies:** Active gullies not present under normal precipitation regime. Existing gullies should be “healed” with good vegetative cover and no active erosion evident.

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 to 6, normally 6. 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 & tall rhizomatous and tufted perennial cool- and warm-season grasses) with fine and coarse roots positively influences infiltration.

11. **Presence and thickness of compaction layer (usually none; describe soil profile features which may be mistaken for compaction on this site):** None.

12. **Functional/Structural Groups (list in order of descending dominance by above-ground annual-production or live foliar cover using symbols: >>, >, = to indicate much greater than, greater than, and equal to):**

    Dominant: Mid, cool-season bunchgrasses > mid, cool-season rhizomatous grasses >

    Sub-dominant: Tall/mid, warm-season grasses > short, warm-season grasses = forbs >

    Other: grass-likes = shrubs > short, cool-season rhizomatous grasses > short, cool-season bunchgrasses

    Additional: Due to differing root structure and distribution, Kentucky bluegrass and smooth bromegrass 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):** Very little evidence of decadence or mortality. Bunch grasses have strong, healthy centers and shrubs are vigorous. Some decadence may be observable following prolonged periods of below normal precipitation.

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 = 2400 lbs./ac air dry with a range of 1400 to 3400 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 weeds, Kentucky bluegrass, smooth bromegrass.

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.