USDA Natural Resources Conservation Service

Ecological site R053BY015ND
Thin 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.

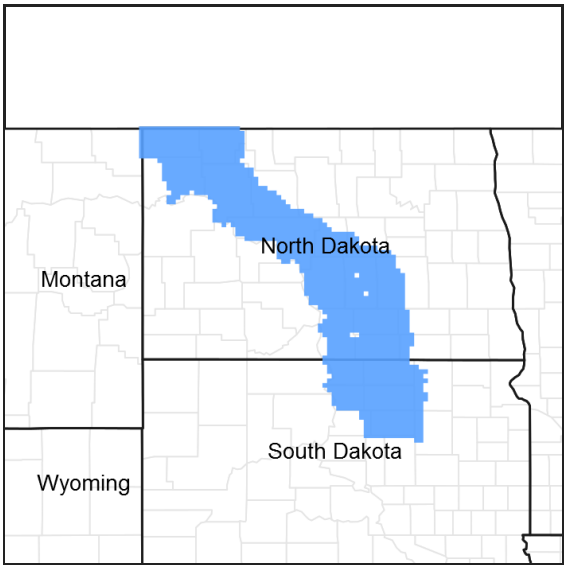


Figure 1. Mapped extent

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**
R053BY007ND	**Sands**
R053BY008ND	**Sandy**
R053BY009ND	**Shallow Loamy**
R053BY010ND	**Shallow Gravel**
R053BY011ND	**Loamy**

Similar sites

R053BY009ND	**Shallow Loamy** [Somewhat excessively drained soils more than 10 less than 20 inches to bedrock that restricts root penetration. Surface layer will ribbon less than 2 inches and greater than 1 inch. Upslope from Loamy sites and sometimes down slope from Very Shallow site. Indicator species: needlegrasses, plains muhly, sideoats grama and little bluestem, with dotted gayfeather, pasqueflower and purple coneflower, and shrubs like broom snakeweed. This site has similar species but more plains muhly and western wheatgrass, less little bluestem, a restrictive layer above twenty inches, and less production.]
R053BY011ND	**Loamy** [Found on dry uplands, upslope from Loamy Overflow site, down slope from Thin Loamy or Shallow Loamy sites; similar landscape position as Sandy, Sands, Clayey sites. Will ribbon greater than 1 inch and up to 2 inches. Indicator species are western wheatgrass, green needlegrass and blue grama, with fringed sagewort and western snowberry being the dominant shrubs. Higher production, different landscape position, less little bluestem, plains muhly, and sideoats grama, more western wheatgrass and green needlegrass.]

Table 1. Dominant plant species

Tree	Not specified
Shrub	Not specified
Herbaceous	(1) *Schizachyrium scoparium*

Physiographic features

This site typically occurs on moderately steep to steep uplands.

Table 2. Representative physiographic features

Landforms	(1) Till plain (2) Moraine (3) Hill
Flooding frequency	None
Ponding frequency	None
Elevation	1,600–2,000 ft
Slope	1–60%
Water table depth	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)	142 days
Freeze-free period (average)	122 days
Precipitation total (average)	18 in

Influencing water features

No significant water features influence this site.

Soil features

These are very deep, well drained, moderately coarse to moderately fine textured soils.
These soils have a strongly calcareous subsoil or are calcareous to the surface. Saturated hydraulic conductivity is moderate to moderately slow and available water capacity is high. Salinity is none to very slight and sodicity is none. This site is on side slopes or ridges on nearly level to very steep moraines, hills and till plains. Slope ranges from 1 to 60 percent. It is not uncommon to have some pedestalling of plants due to the inherent instability of the soils. Water flow paths are broken, irregular in appearance or discontinuous, and there is a risk of rills and eventually gullies if vegetative cover is not adequate. Cryptobiotic crusts are present. Sub-surface soil layers are slightly restrictive to water movement and root penetration.

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

Major soil series correlated to this ecological site can be found in Section II of the Natural Resources Conservation Service Field Office Technical Guide or the following web sites:
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	Well drained
Permeability class	Moderately slow to moderate
Soil depth	80 in
Surface fragment cover <=3"	0–10%
Surface fragment cover >3"	0–50%
Available water capacity (0-40in)	7–8 in
Calcium carbonate equivalent (0-40in)	0–45%
Electrical conductivity (0-40in)	0–2 mmhos/cm
Sodium adsorption ratio (0-40in)	0–3
Soil reaction (1:1 water) (0-40in)	6.6–8.4

Subsurface fragment volume <=3" (Depth not specified)	0–15%
Subsurface fragment volume >3" (Depth not specified)	0–10%

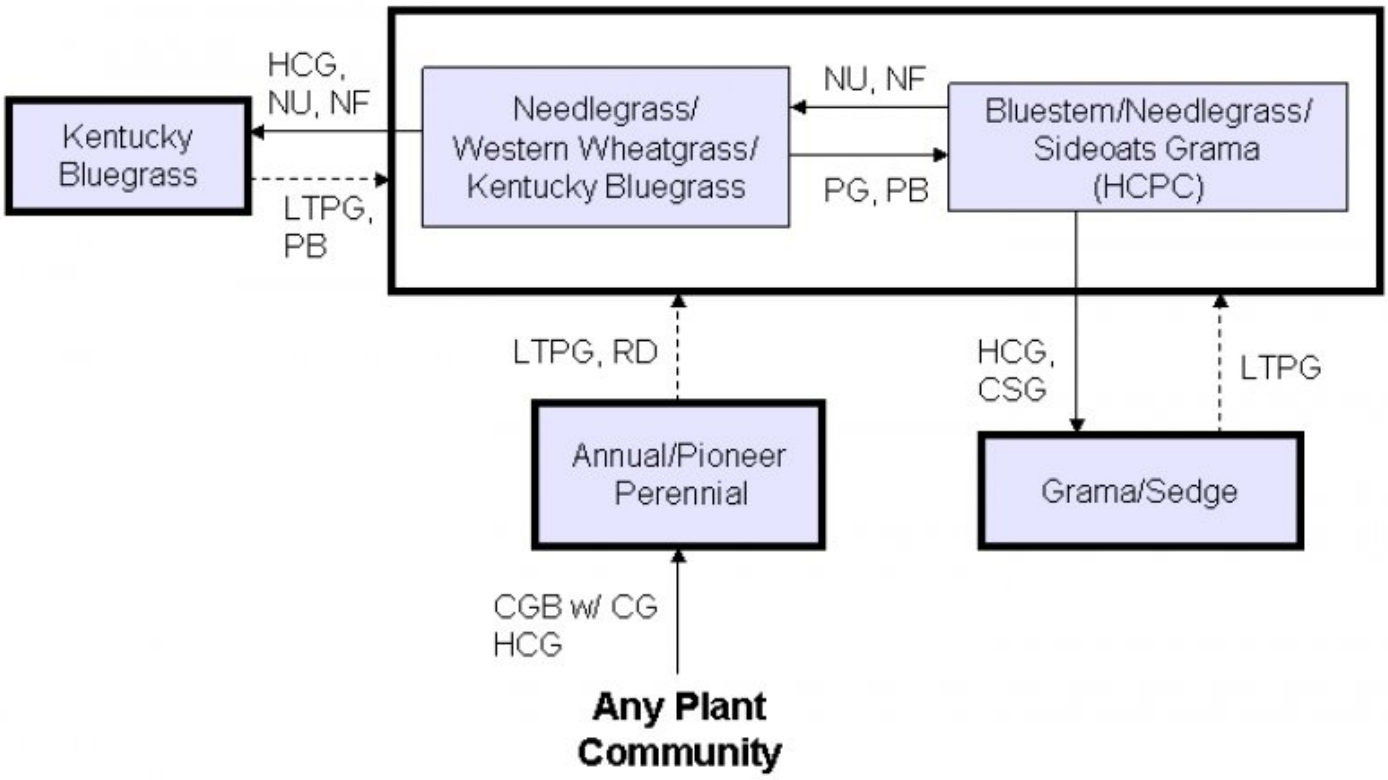
Ecological dynamics

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

The plant community upon which interpretations are primarily based is the Historic Climax Plant Community. The HCPC has been determined by study of rangeland relic areas, areas protected from excessive disturbance, and areas under long-term rotational grazing regimes. Trends in plant community dynamics ranging from heavily grazed to lightly grazed areas, seasonal use pastures, and historical accounts also have been considered. Subclimax plant communities, states, transitional pathways, and thresholds have been determined through similar studies and experience.
Several years of continuous grazing without adequate recovery periods, following each grazing occurrence will likely cause this site to depart from the HCPC. Species such as western wheatgrass and blue grama will initially increase while little bluestem will sustain. Porcupine grass and/or green needlegrass, plains muhly and sideoats grama will decrease in frequency and production. Heavy continuous grazing causes blue grama to increase and eventually dominates with eroded gaps between while little bluestem stays in wolf plant colonies. In time, heavy continuous grazing will likely cause upland sedges and blue grama to dominate and pioneer perennials, and annuals to increase.

Extended periods of non-use and/or lack of fire will result in excessive litter, which favors an increase in Kentucky bluegrass, smooth bromegrass and/or crested wheatgrass. In many areas shrubs such as western snowberry and fringed sagewort will also 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; **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; **RD** – Removal of disturbance.

State 1
Bluestem/Needlegrass/Sideoats Grama (HCPC)

Community 1.1
Bluestem/Needlegrass/Sideoats Grama (HCPC)

This is the interpretive plant community for this site and is considered to be the Historic Climax Plant Community (HCPC). This community evolved with grazing by large herbivores and occasional prairie 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 site is dominated by a mixture of cool and warm-season grasses. The major grasses include the needlegrasses, little bluestem, plains muhly and sideoats grama. Other grasses occurring on the site include western wheatgrass, blue grama and big bluestem. 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	1275	1690	2105
Forb	90	143	195
Shrub/Vine	35	67	100
Total	**1400**	**1900**	**2400**

Figure 7. 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
Needlegrass/Western Wheatgrass/Kentucky Bluegrass

Community 2.1
Needlegrass/Western Wheatgrass/Kentucky Bluegrass

This plant community develops after an extended period 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 accumulates as this community develops. Litter buildup reduces plant vigor and density, and seedling recruitment declines. Eventually litter levels become abundant enough to crowd out living plants and reduce plant density. Due to a lack of tiller stimulation and sunlight, native bunchgrasses typically develop dead centers and native rhizomatous grasses are limited to small colonies. Heavy litter covers shorter understory species (i.e. shortgrasses and sedges) restricting their ability to capture adequate sunlight for photosynthesis. Vigor and diversity of native plants are reduced. The dominant grasses are the needlegrasses and western wheatgrass. Non-native grasses, such as Kentucky bluegrass and smooth bromegrass tend to invade. Other grasses present include little bluestem, plains muhly, sideoats grama and blue grama. 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. This plant community is resistant to change without prescribed grazing and/or fire. The combination of both grazing and fire is most effective in moving this plant community towards the HCPC. Soil erosion is low. Compared to the HCPC, infiltration is reduced to the lower root zone. Runoff is similar to the HCPC. This plant community tends to be moisture loving and usually tends to utilize the spring moisture quickly causing forage base to become dry and not very palatable early in the summer.

Table 6. Annual production by plant type

Plant Type	Low (Lb/Acre)	Representative Value (Lb/Acre)	High (Lb/Acre)
Grass/Grasslike	860	1238	1615
Forb	70	150	230
Shrub/Vine	70	112	155
Total	**1000**	**1500**	**2000**

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

State 3
Grama/Sedge

Community 3.1
Grama/Sedge

This plant community evolves from heavy grazing over several years of time. Diversity is lost as the short grasses become dominant in the plant community. Big bluestem, little bluestem, western wheatgrass and the needlegrasses are replaced by the grazing tolerant blue grama, and sedges. Sideoats grama remains in the plant community, but is less productive because of the mid-summer grazing pressure. Because they are less palatable, cudweed sagewort, and green sagewort become more prevalent in the plant community. This plant community is resistant to change. The herbaceous species present are not suitable to grazing.

Table 7. Annual production by plant type

Plant Type	Low (Lb/Acre)	Representative Value (Lb/Acre)	High (Lb/Acre)
Grass/Grasslike	420	742	1165
Shrub/Vine	40	90	140
Forb	40	68	95
Total	**500**	**900**	**1400**

Figure 11. 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 develops after an extended period of 10 or more years of non-use by herbivores and exclusion of fire, or by heavy continuous grazing. The main difference is in the amount of litter present on the site. 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. With non-use and no fire, plant litter accumulates in large amounts as this community develops. Litter buildup reduces plant vigor and density, and seedling recruitment declines. Eventually litter levels become abundant enough to crowd out living

plants and reduce plant density. Annual and/or biennial forbs, annual grasses, and cryptograms commonly fill these interspaces. Due to a lack of tiller stimulation and sunlight, native bunchgrasses typically develop dead centers and native rhizomatous grasses are limited to small colonies. Heavy litter covers shorter understory species (i.e. shortgrasses and sedges) restricting their ability to capture adequate sunlight for photosynthesis. Vigor and diversity of native plants are reduced. Non-native grasses, such as Kentucky bluegrass, crested wheatgrass and smooth bromegrass tend to invade and may dominate this plant community. Other grasses present include western wheatgrass, porcupine grass, green needlegrass and bearded wheatgrass. 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. This plant community is resistant to change without prescribed grazing and/or fire. The combination of both grazing and fire is most effective in moving this plant community towards the HCPC. Soil erosion is low. Compared to the HCPC, infiltration is reduced to the lower root zone. Runoff is similar to the HCPC. This plant community tends to be moisture loving and usually tends to utilize the spring moisture quickly causing forage base to become dry and not very palatable early in the summer. Once this plant community is reached, time and external resources will be needed to see any immediate recovery in the diversity of the site.

Table 8. Annual production by plant type

Plant Type	Low (Lb/Acre)	Representative Value (Lb/Acre)	High (Lb/Acre)
Grass/Grasslike	445	852	1360
Forb	105	165	225
Shrub/Vine	50	83	115
Total	**600**	**1100**	**1700**

Figure 13. 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	**Little Bluestem**			285–475	
	little bluestem	SCSC	*Schizachyrium scoparium*	285–475	–
2	**Plains Muhly**			95–190	
	plains muhly	MUCU3	*Muhlenbergia cuspidata*	95–190	–
3	**Sideoats Grama**			95–190	
	sideoats grama	BOCU	*Bouteloua curtipendula*	95–190	–
4	**Needlegrass**			190–380	
	porcupinegrass	HESP11	*Hesperostipa spartea*	95–380	–
	green needlegrass	NAVI4	*Nassella viridula*	95–285	–
	needle and thread	HECOC8	*Hesperostipa comata ssp. comata*	38–190	–
	shortbristle needle and thread	HECU9	*Hesperostipa curtiseta*	0–190	–
5	**Short Warm Season**			38–95	
	blue grama	BOGR2	*Bouteloua gracilis*	38–95	–
6	**Other Native Grasses**			95–190	
	Grass, perennial	2GP	*Grass, perennial*	0–95	–

	big bluestem	ANGE	*Andropogon gerardii*	0–95	–
	prairie sandreed	CALO	*Calamovilfa longifolia*	0–95	–
	slender wheatgrass	ELTR7	*Elymus trachycaulus*	19–95	–
	western wheatgrass	PASM	*Pascopyrum smithii*	38–95	–
	prairie Junegrass	KOMA	*Koeleria macrantha*	19–38	–
	Fendler threeawn	ARPUL	*Aristida purpurea var. longiseta*	0–38	–
	plains reedgrass	CAMO	*Calamagrostis montanensis*	0–19	–
7	**Grass-Likes**			38–95	
	threadleaf sedge	CAFI	*Carex filifolia*	38–95	–
	sun sedge	CAINH2	*Carex inops ssp. heliophila*	0–95	–
	Pennsylvania sedge	CAPE6	*Carex pensylvanica*	0–95	–
	Grass-like (not a true grass)	2GL	*Grass-like (not a true grass)*	0–38	–
Forb					
9	**Forbs**			95–190	
	Forb, perennial	2FP	*Forb, perennial*	0–57	–
	western yarrow	ACMIO	*Achillea millefolium var. occidentalis*	19–38	–
	prairie clover	DALEA	*Dalea*	19–38	–
	stiff sunflower	HEPA19	*Helianthus pauciflorus*	19–38	–
	blazing star	LIATR	*Liatris*	19–38	–
	scurfpea	PSORA2	*Psoralidium*	19–38	–
	eastern pasqueflower	PUPA5	*Pulsatilla patens*	19–38	–
	upright prairie coneflower	RACO3	*Ratibida columnifera*	19–38	–
	goldenrod	SOLID	*Solidago*	19–38	–
	lacy tansyaster	MAPI	*Machaeranthera pinnatifida*	19–38	–
	Forb, annual	2FA	*Forb, annual*	0–38	–
	American vetch	VIAM	*Vicia americana*	19–38	–
	large Indian breadroot	PEES	*Pediomelum esculentum*	0–19	–
	spiny phlox	PHHO	*Phlox hoodii*	0–19	–
	scarlet globemallow	SPCO	*Sphaeralcea coccinea*	0–19	–
	white heath aster	SYER	*Symphyotrichum ericoides*	0–19	–
	rush skeletonplant	LYJU	*Lygodesmia juncea*	0–19	–
	onion	ALLIU	*Allium*	0–19	–
	pussytoes	ANTEN	*Antennaria*	0–19	–
	tarragon	ARDR4	*Artemisia dracunculus*	0–19	–
	milkvetch	ASTRA	*Astragalus*	0–19	–
	wavyleaf thistle	CIUN	*Cirsium undulatum*	0–19	–
Shrub/Vine					
10	**Shrubs**			38–95	
	Subshrub (<.5m)	2SUBS	*Subshrub (<.5m)*	0–57	–
	leadplant	AMCA6	*Amorpha canescens*	19–57	–
	prairie sagewort	ARFR4	*Artemisia frigida*	19–38	–
	silverberry	ELCO	*Elaeagnus commutata*	0–38	–
	rose	ROSA5	*Rosa*	19–38	–

	western snowberry	SYOC	*Symphoricarpos occidentalis*	0–38	–
	pricklypear	OPUNT	*Opuntia*	0–19	–
	dwarf false indigo	AMNA	*Amorpha nana*	0–19	–
	Saskatoon serviceberry	AMAL2	*Amelanchier alnifolia*	0–19	–

Table 10. Community 2.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production (Lb/Acre)	Foliar Cover (%)
Grass/Grasslike					
1	**Little Bluestem**			30–180	
	little bluestem	SCSC	*Schizachyrium scoparium*	30–180	–
2	**Plains Muhly**			0–45	
	plains muhly	MUCU3	*Muhlenbergia cuspidata*	0–45	–
3	**Sidoats Grama**			0–30	
	sideoats grama	BOCU	*Bouteloua curtipendula*	0–30	–
4	**Needlegrass**			75–300	
	needle and thread	HECOC8	*Hesperostipa comata ssp. comata*	75–225	–
	shortbristle needle and thread	HECU9	*Hesperostipa curtiseta*	0–75	–
	porcupinegrass	HESP11	*Hesperostipa spartea*	0–75	–
	green needlegrass	NAVI4	*Nassella viridula*	0–75	–
5	**Short Warm-Season**			0–45	
	blue grama	BOGR2	*Bouteloua gracilis*	0–45	–
6	**Other Native Grasses**			120–300	
	western wheatgrass	PASM	*Pascopyrum smithii*	75–225	–
	slender wheatgrass	ELTR7	*Elymus trachycaulus*	30–120	–
	Grass, perennial	2GP	*Grass, perennial*	0–75	–
	Fendler threeawn	ARPUL	*Aristida purpurea var. longiseta*	0–75	–
	prairie Junegrass	KOMA	*Koeleria macrantha*	15–45	–
	big bluestem	ANGE	*Andropogon gerardii*	0–15	–
7	**Grass-Likes**			0–45	
	threadleaf sedge	CAFI	*Carex filifolia*	0–45	–
	sun sedge	CAINH2	*Carex inops ssp. heliophila*	0–30	–
	Grass-like (not a true grass)	2GL	*Grass-like (not a true grass)*	0–30	–
8	**Non-Native Grasses**			75–180	
	Kentucky bluegrass	POPR	*Poa pratensis*	45–180	–
	smooth brome	BRIN2	*Bromus inermis*	0–120	–
	cheatgrass	BRTE	*Bromus tectorum*	15–75	–
Forb					
9	**Forbs**			75–225	
	sweetclover	MELIL	*Melilotus*	0–150	–
	Forb, annual	2FA	*Forb, annual*	15–75	–
	Forb, perennial	2FP	*Forb, perennial*	15–75	–
	tarragon	ARDR4	*Artemisia dracunculus*	15–60	–

	white heath aster	SYER	*Symphyotrichum ericoides*	15–60	–
	yellow salsify	TRDU	*Tragopogon dubius*	0–45	–
	scurfpea	PSORA2	*Psoralidium*	15–45	–
	goldenrod	SOLID	*Solidago*	15–45	–
	lacy tansyaster	MAPI	*Machaeranthera pinnatifida*	0–30	–
	upright prairie coneflower	RACO3	*Ratibida columnifera*	15–30	–
	blazing star	LIATR	*Liatris*	15–30	–
	prairie clover	DALEA	*Dalea*	15–30	–
	western yarrow	ACMIO	*Achillea millefolium var. occidentalis*	15–30	–
	onion	ALLIU	*Allium*	0–15	–
	stiff sunflower	HEPA19	*Helianthus pauciflorus*	0–15	–
	milkvetch	ASTRA	*Astragalus*	0–15	–
	wavyleaf thistle	CIUN	*Cirsium undulatum*	0–15	–
	rush skeletonplant	LYJU	*Lygodesmia juncea*	0–15	–
	eastern pasqueflower	PUPA5	*Pulsatilla patens*	0–15	–
	scarlet globemallow	SPCO	*Sphaeralcea coccinea*	0–15	–
	American vetch	VIAM	*Vicia americana*	0–15	–
Shrub/Vine					
10	**Shrubs**			75–150	
	prairie sagewort	ARFR4	*Artemisia frigida*	15–75	–
	rose	ROSA5	*Rosa*	15–75	–
	western snowberry	SYOC	*Symphoricarpos occidentalis*	0–75	–
	Subshrub (<.5m)	2SUBS	*Subshrub (<.5m)*	0–45	–
	silverberry	ELCO	*Elaeagnus commutata*	0–30	–
	pricklypear	OPUNT	*Opuntia*	0–15	–
	leadplant	AMCA6	*Amorpha canescens*	0–15	–

Table 11. Community 3.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production (Lb/Acre)	Foliar Cover (%)
Grass/Grasslike					
1	**Little Bluestem**			0–45	
	little bluestem	SCSC	*Schizachyrium scoparium*	0–45	–
3	**Sideoats Grama**			0–45	
	sideoats grama	BOCU	*Bouteloua curtipendula*	0–45	–
4	**Needlegrass**			0–45	
	needle and thread	HECOC8	*Hesperostipa comata ssp. comata*	0–45	–
	shortbristle needle and thread	HECU9	*Hesperostipa curtiseta*	0–9	–
	green needlegrass	NAVI4	*Nassella viridula*	0–9	–
5	**Short Warm-Season**			135–225	
	blue grama	BOGR2	*Bouteloua gracilis*	135–225	–
6	**Other Native Grasses**			36–126	

	Fendler threeawn	ARPUL	*Aristida purpurea var. longiseta*	18–90	–
	Grass, perennial	2GP	*Grass, perennial*	0–45	–
	western wheatgrass	PASM	*Pascopyrum smithii*	9–45	–
	prairie Junegrass	KOMA	*Koeleria macrantha*	9–18	–
7	**Grass-Likes**			90–180	
	threadleaf sedge	CAFI	*Carex filifolia*	90–180	–
	sun sedge	CAINH2	*Carex inops ssp. heliophila*	0–45	–
	Pennsylvania sedge	CAPE6	*Carex pensylvanica*	0–45	–
	Grass-like (not a true grass)	2GL	*Grass-like (not a true grass)*	0–45	–
8	**Non-Native Grasses**			0–9	
	cheatgrass	BRTE	*Bromus tectorum*	0–9	–
	Kentucky bluegrass	POPR	*Poa pratensis*	0–9	–
Forb					
9	**Forbs**			45–90	
	Forb, annual	2FA	*Forb, annual*	9–45	–
	Forb, perennial	2FP	*Forb, perennial*	9–45	–
	tarragon	ARDR4	*Artemisia dracunculus*	9–45	–
	sweetclover	MELIL	*Melilotus*	0–45	–
	eastern pasqueflower	PUPA5	*Pulsatilla patens*	9–27	–
	upright prairie coneflower	RACO3	*Ratibida columnifera*	9–18	–
	goldenrod	SOLID	*Solidago*	9–18	–
	lacy tansyaster	MAPI	*Machaeranthera pinnatifida*	9–18	–
	scurfpea	PSORA2	*Psoralidium*	9–18	–
	prairie clover	DALEA	*Dalea*	9–18	–
	blazing star	LIATR	*Liatris*	9–18	–
	western yarrow	ACMIO	*Achillea millefolium var. occidentalis*	9–18	–
	white heath aster	SYER	*Symphyotrichum ericoides*	9–18	–
	yellow salsify	TRDU	*Tragopogon dubius*	0–18	–
	pussytoes	ANTEN	*Antennaria*	0–9	–
	rush skeletonplant	LYJU	*Lygodesmia juncea*	0–9	–
	milkvetch	ASTRA	*Astragalus*	0–9	–
	wavyleaf thistle	CIUN	*Cirsium undulatum*	0–9	–
	spiny phlox	PHHO	*Phlox hoodii*	0–9	–
	scarlet globemallow	SPCO	*Sphaeralcea coccinea*	0–9	–
Shrub/Vine					
10	**Shrubs**			45–135	
	prairie sagewort	ARFR4	*Artemisia frigida*	18–72	–
	rose	ROSA5	*Rosa*	9–36	–
	western snowberry	SYOC	*Symphoricarpos occidentalis*	0–36	–
	pricklypear	OPUNT	*Opuntia*	9–27	–
	Subshrub (<.5m)	2SUBS	*Subshrub (<.5m)*	0–27	–

Table 12. Community 4.1 plant community composition

				Annual Production	Foliar Cover

Group	Common Name	Symbol	Scientific Name	Annual Production (Lb/Acre)	Foliar Cover (%)
Grass/Grasslike					
1	**Little Bluestem**			0–22	
	little bluestem	SCSC	*Schizachyrium scoparium*	0–22	–
4	**Needlegrass**			11–66	
	needle and thread	HECOC8	*Hesperostipa comata ssp. comata*	11–55	–
	green needlegrass	NAVI4	*Nassella viridula*	0–55	–
	shortbristle needle and thread	HECU9	*Hesperostipa curtiseta*	0–33	–
5	**Short Warm-Season**			0–22	
	blue grama	BOGR2	*Bouteloua gracilis*	0–22	–
6	**Other Native Grasses**			44–110	
	Fendler threeawn	ARPUL	*Aristida purpurea var. longiseta*	22–110	–
	Grass, perennial	2GP	*Grass, perennial*	0–55	–
	western wheatgrass	PASM	*Pascopyrum smithii*	11–55	–
	slender wheatgrass	ELTR7	*Elymus trachycaulus*	0–22	–
	prairie Junegrass	KOMA	*Koeleria macrantha*	11–22	–
7	**Grass-Likes**			11–55	
	threadleaf sedge	CAFI	*Carex filifolia*	11–55	–
	Grass-like (not a true grass)	2GL	*Grass-like (not a true grass)*	0–22	–
8	**Non-Native Grasses**			275–495	
	Kentucky bluegrass	POPR	*Poa pratensis*	110–440	–
	smooth brome	BRIN2	*Bromus inermis*	0–275	–
	cheatgrass	BRTE	*Bromus tectorum*	11–88	–
Forb					
9	**Forbs**			110–220	
	sweetclover	MELIL	*Melilotus*	0–110	–
	tarragon	ARDR4	*Artemisia dracunculus*	11–77	–
	Forb, annual	2FA	*Forb, annual*	11–55	–
	Forb, perennial	2FP	*Forb, perennial*	11–55	–
	goldenrod	SOLID	*Solidago*	11–55	–
	white heath aster	SYER	*Symphyotrichum ericoides*	11–55	–
	yellow salsify	TRDU	*Tragopogon dubius*	0–55	–
	scurfpea	PSORA2	*Psoralidium*	11–33	–
	western yarrow	ACMIO	*Achillea millefolium var. occidentalis*	11–22	–
	prairie clover	DALEA	*Dalea*	11–22	–
	blazing star	LIATR	*Liatris*	11–22	–
	upright prairie coneflower	RACO3	*Ratibida columnifera*	11–22	–
	rush skeletonplant	LYJU	*Lygodesmia juncea*	0–11	–
	milkvetch	ASTRA	*Astragalus*	0–11	–
	wavyleaf thistle	CIUN	*Cirsium undulatum*	0–11	–
	onion	ALLIU	*Allium*	0–11	–
	eastern pasqueflower	PUPA5	*Pulsatilla patens*	0–11	–

	scarlet globemallow	SPCO	*Sphaeralcea coccinea*	0–11	–
Shrub/Vine					
10	**Shrubs**			55–110	
	rose	ROSA5	*Rosa*	11–55	–
	western snowberry	SYOC	*Symphoricarpos occidentalis*	0–55	–
	prairie sagewort	ARFR4	*Artemisia frigida*	11–55	–
	Subshrub (<.5m)	2SUBS	*Subshrub (<.5m)*	0–33	–
	silverberry	ELCO	*Elaeagnus commutata*	0–11	–
	pricklypear	OPUNT	*Opuntia*	0–11	–

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 group B, with localized area in hydrologic group C. Infiltration varies from moderately slow to moderate and runoff potential for this site varies from low to high 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 13 1968 – 1986 ND, SD Burke, Edmunds, Emmons,
McPherson, Walworth, 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	01/17/2012
Approved by	Suzanne Mayne-Kinney
Approval date	
Composition (Indicators 10 and 12) based on	Annual Production

Indicators

1. **Number and extent of rills:** None on slopes less than 25%. On slopes > 25% rills may be visible but are short (12 to 20 inches) and discontinuous.

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2. **Presence of water flow patterns:** None on slopes <25%. May be observable on slopes greater than 25% but are

relatively short (several feet or less in length) and not connected.

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3. **Number and height of erosional pedestals or terracettes:** Not observable on slopes < 25%. Some pedestalling evident on slopes > 25% with occassonal terracettes.

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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 10 to 15% consisting of randomly scattered small patches no greater than 2 inches in diameter. Rocks could account for 5% of the ground cover.

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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):** Plant litter remains in place on slopes < 25%. Slight movement may be visible following intense thunderstorm events particularly after extended periods of below normal precipitation. On slopes >25%, short movement (< 24 inches) of fine plant litter may be visible and litter debris dams are occasionally present.

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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):** 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.

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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 >

    Sub-dominant: Mid cool-season bunchgrasses >

Other: Forbs > grass-likes = tall warm-season grasses = mid cool-season rhizomatous > short warm-season grasses = shrubs > short cool-season grasses

Additional: Due to differing root structure and distribution, Kentucky bluegrass and smooth bromegrass 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):** None.

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14. **Average percent litter cover (%) and depth (in):** 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 = 1900 lbs./ac air dry with a range of 1400 to 2400 lbs./ac 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, Kentucky bluegrass, smooth bromegrass

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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.
