

Ecological site R053BY013ND **Thin Claypan**

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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.

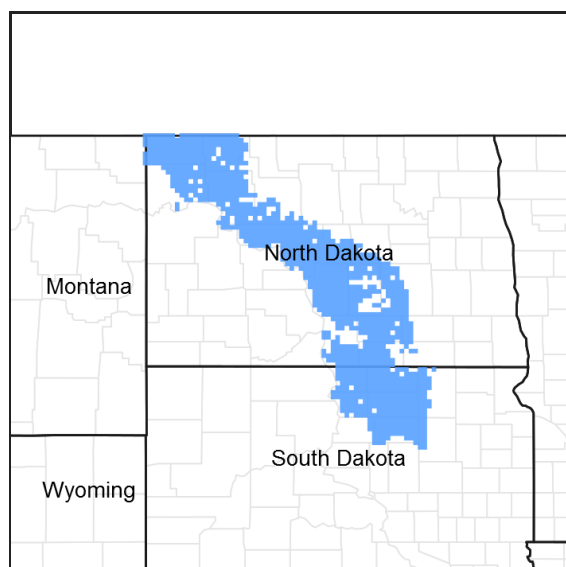


Figure 1. Mapped extent

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
R053BY003ND	Closed Depression
R053BY008ND	Sandy
R053BY011ND	Loamy

Similar sites

R054XY035ND	Very Shallow [Excessively well drained soils less than 10 inches to scoria, gravels, shales, siltstone or sandstone bedrock that restricts root penetration, upslope of Shallow loamy site. Indicator species are little bluestem, sideoats grama, blue grama, purple coneflower, pasqueflower and creeping juniper. There is more little bluestem, similar production, and a different restrictive layer.]
R054XY021ND	Claypan [Well drained soils on uplands or terraces that don't receive extra moisture; 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. This site has a deeper sodic subsoil layer, more production, similar species, less blue grama, more needleandthread and green needlegrass.]

Table 1. Dominant plant species

Tree	Not specified
Shrub	Not specified
Herbaceous	(1) <i>Pascopyrum smithii</i> (2) <i>Bouteloua gracilis</i>

Physiographic features

This site occurs on level to gently sloping uplands.

Table 2. Representative physiographic features

Landforms	(1) Till plain (2) Lake plain (3) Terrace
Flooding frequency	None
Elevation	488–610 m
Slope	0–9%
Water table depth	107–203 cm
Aspect	Aspect is not a significant factor

Climatic features

MLRA 53B is considered to have a continental climate – cold winters and hot summers, low humidity, light rainfall, and much sunshine. Extremes in temperature are characteristic. The climate is the result of this MLRA's location in the geographic center of North America. There are few natural barriers on the northern Great Plains. The air masses move unobstructed across the plains and account for rapid changes in temperature.

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

Growth of native cool-season plants begins in late March and continues to early to mid July. Native warm-season plants begin growth in mid May and continue to the end of August. Green up of cool-season plants can occur in September and October when adequate soil moisture is present.

Table 3. Representative climatic features

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

Influencing water features

No significant water features influence this site.

Soil features

These are moderately deep to very deep, moderately well and well drained, moderately coarse to fine textured soils. The thin surface layer is underlain by a dense sodic subsoil. Saturated hydraulic conductivity is very slow and available water capacity is low. Salinity is moderate to strong at depths of less than 16 inches and sodicity is high. This site is on nearly level to strongly sloping flats and side slopes on terraces, lake plains, and till plains. Slope ranges from 0 to 9 percent. Wet surface compaction can occur with heavy traffic. Waterflow paths are broken, irregular in appearance or discontinuous, and there is a high risk of rills and eventually gullies if vegetative cover is not adequate. Cryptobiotic crusts are present and a moderate pedestalling of plants occur.

These soils are mainly susceptible to water erosion. 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	Moderately well drained to well drained
Permeability class	Very slow
Soil depth	8–13 cm
Surface fragment cover ≤3"	0%
Surface fragment cover >3"	0%
Available water capacity (0-101.6cm)	2.54–7.62 cm
Calcium carbonate equivalent (0-101.6cm)	0–30%
Electrical conductivity (0-101.6cm)	0–16 mmhos/cm
Sodium adsorption ratio (0-101.6cm)	0–20
Soil reaction (1:1 water) (0-101.6cm)	5.6–9
Subsurface fragment volume ≤3" (Depth not specified)	0–10%
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 management actions and/or climatic conditions. 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 HCPC.

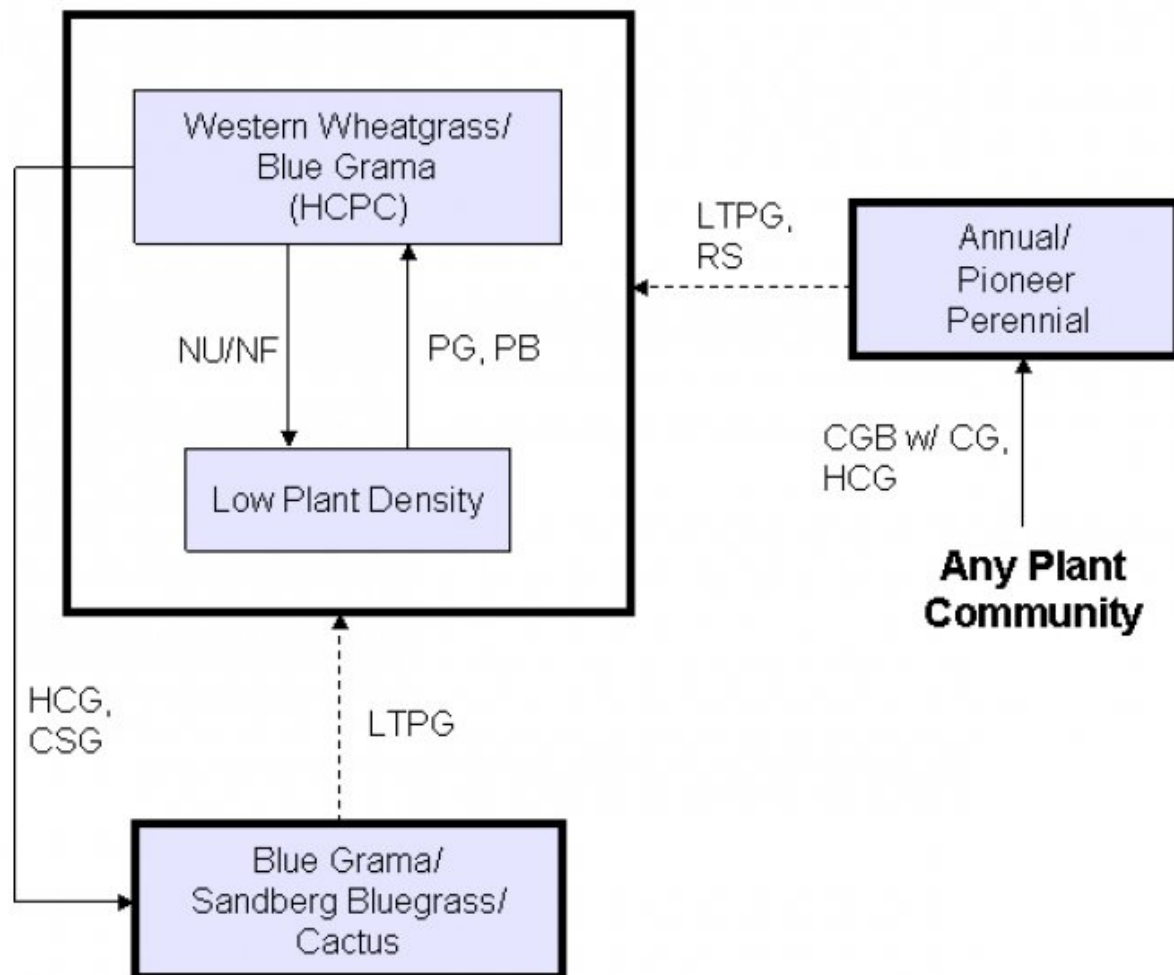
The plant community upon which the interpretations are primarily based is the HCPC. The HCPC has been determined by study of rangeland relic areas, areas protected from excessive disturbance, and areas under long-term rotational grazing regimes. Trends in plant community dynamics ranging from heavily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

Continuous grazing without adequate recovery periods following each grazing occurrence over several years causes this site to depart from the HCPC. Species such as blue grama, Sandberg bluegrass, and inland saltgrass will increase. Western wheatgrass and prairie junegrass will decrease in frequency and production. In time, heavy continuous grazing will likely cause 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 low density, which favors an increase in Sandberg bluegrass, and in time, shrubs such as cactus.

The following diagram illustrates the common plant communities and vegetation states commonly occurring on the site and the transition pathways between communities and states. The ecological processes will be discussed in more detail in the plant community descriptions following the diagram.

State and transition model



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

State 1
Western Wheatgrass/Blue Grama (HCPC)

Community 1.1
Western Wheatgrass/Blue Grama (HCPC)

This is the interpretive plant community for this site, and it is also considered the Historic Climax Plant Community (HCPC). This site evolved with grazing by large herbivores and occasional prairie fires. This plant community can be found on areas having a history of proper grazing management, including adequate recovery periods between grazing events. The potential vegetation is about 85% grasses or grass-like plants, 10% forbs and 5% shrubs. Cool season grasses dominate the site, but warm season short grasses are also prevalent. The co-dominant grasses are western wheatgrass and blue grama. Other grasses and grass-like plants occurring on the site include needleandthread, buffalograss, Sandberg bluegrass and sedges. Significant forbs may include prairie coneflower, scarlet globemallow, Lambert’s crazyweed, and western yarrow. Shrubs include broom snakeweed, brittle cactus 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 some movement off-site and natural plant mortality is low. The diversity in plant species allows for some drought tolerance. This is a fragile, but sustainable plant community. Low to moderate available water capacity coupled with high accumulations of sodium and slow permeability strongly influences the soil-water-plant relationships.

Table 5. Annual production by plant type

Plant Type	Low (Kg/Hectare)	Representative Value (Kg/Hectare)	High (Kg/Hectare)
Grass/Grasslike	538	1020	1278
Forb	17	67	118
Shrub/Vine	6	34	62
Total	561	1121	1458

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

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

State 2
Blue Grama/Sandberg Bluegrass/Cactus

Community 2.1
Blue Grama/Sandberg Bluegrass/Cactus

This plant community can quickly develop from the adverse effects of heavy continuous grazing and/or annual, early spring seasonal grazing. Annual grazing too early in the spring depletes stored carbohydrates, resulting in weakening and eventual death of the cool season mid-grasses. Short grasses and forbs increase to dominate the site and annual production decreases dramatically. Lack of litter and reduced 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. This plant community can occur throughout the pasture, on spot grazed areas, and around water sources where season-long grazing patterns occur. Blue grama and buffalograss are the dominant species with the balance being a few species of cool-season grasses and warm-season grasses including buffalograss, inland saltgrass, needleandthread, prairie junegrass, and annual grasses. Forbs and shrubs such as broom snakeweed, cudweed sagewort, heath aster, brittle cactus and western yarrow may also be present. There is usually more than 25% bare ground. This plant community is quite resilient. The thick sod and competitive advantage prevents other species from establishing. This plant community is less productive than the HCPC. Runoff

increases and infiltration will decrease. Soil erosion will be minimal due to the sod forming habit of blue grama and buffalograss.

Table 6. Annual production by plant type

Plant Type	Low (Kg/Hectare)	Representative Value (Kg/Hectare)	High (Kg/Hectare)
Grass/Grasslike	191	381	572
Shrub/Vine	17	34	50
Forb	17	34	50
Total	225	449	672

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

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

State 3 Low Plant Density

Community 3.1 Low Plant Density

This plant community develops after an extended period of 20 or more years of non-use by herbivores and exclusion of fire. This plant community is dispersed throughout the pasture, encircling spot grazed areas, and areas distant from water sources. This is a typical pattern found in properly stocked pastures grazed season-long. Plant litter may accumulate as this plant community first develops. Due to a lack of tiller stimulation and sunlight, native bunchgrasses typically develop dead centers and native rhizomatous grasses are limited to colonies. Standing decadent plants and moderate litter covers shorter understory species (i.e. short grasses and sedges), restricting their ability to capture adequate sunlight for photosynthesis. Vigor and diversity of native plants are reduced. Annual and/or biennial forbs, annual grasses, and cryptogams commonly fill interspaces once occupied by desirable species. Cheatgrass and sweetclover tend to invade this plant community only when moisture conditions are favorable for these species. Sandberg bluegrass tends to increase along with needleandthread, prairie junegrass and shrubs like broom snakeweed and brittle cactus. Other grasses present include western wheatgrass and sedges with lesser amounts of blue grama and inland saltgrass. The common forbs include Missouri goldenrod, prairie coneflower, silverleaf scurfpea, western yarrow, and heath aster. Fringed sagewort, brittle cactus and broom snakeweed may be the principal shrubs. This plant community is resistant to change without prescribed grazing or fire. Prescribed grazing 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 favor early cool season plant species which are moisture loving and usually tends to utilize the spring moisture quickly causing the soil to become dry and not very productive early in the summer. Once this plant community is reached, any of the preferred treatments can readily return the diversity and production of the site.

Table 7. Annual production by plant type

Plant Type	Low (Kg/Hectare)	Representative Value (Kg/Hectare)	High (Kg/Hectare)
Grass/Grasslike	392	798	1199
Forb	39	67	95
Shrub/Vine	17	31	50
Total	448	896	1344

Figure 9. Plant community growth curve (percent production by month).
ND5302, Missouri Coteau, cool-season dominant, warm-season sub-dominant.. Cool-season dominant, warm-season sub-dominant..

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0	0	3	7	23	42	15	5	4	1	0	0

Additional community tables

Table 8. Community 1.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production (Kg/Hectare)	Foliar Cover (%)
Grass/Grasslike					
1	Wheatgrass			224–392	
	western wheatgrass	PASM	<i>Pascopyrum smithii</i>	224–392	–
	thickspike wheatgrass	ELLAL	<i>Elymus lanceolatus</i> ssp. <i>lanceolatus</i>	0–56	–
2	Short Warm-Season			224–392	
	blue grama	BOGR2	<i>Bouteloua gracilis</i>	168–280	–
	saltgrass	DISP	<i>Distichlis spicata</i>	11–56	–
3	Short Cool-Season			11–56	
	prairie Junegrass	KOMA	<i>Koeleria macrantha</i>	11–34	–
	Sandberg bluegrass	POSE	<i>Poa secunda</i>	0–34	–
4	Other Native Grasses			22–56	
	Graminoid (grass or grass-like)	2GRAM	<i>Graminoid (grass or grass-like)</i>	11–56	–
	needle and thread	HECOC8	<i>Hesperostipa comata</i> ssp. <i>comata</i>	0–34	–
	Nuttall's alkaligrass	PUNU2	<i>Puccinellia nuttalliana</i>	0–22	–
	tumblegrass	SCPA	<i>Schedonnardus paniculatus</i>	0–22	–
5	Grass-Likes			22–56	
	needleleaf sedge	CADU6	<i>Carex duriuscula</i>	11–56	–
	Grass-like (not a true grass)	2GL	<i>Grass-like (not a true grass)</i>	0–34	–
Forb					
7	Forbs			22–112	
	Forb (herbaceous, not grass nor grass-like)	2FORB	<i>Forb (herbaceous, not grass nor grass-like)</i>	0–22	–
	Forb, perennial	2FP	<i>Forb, perennial</i>	0–22	–
	western yarrow	ACMIO	<i>Achillea millefolium</i> var. <i>occidentalis</i>	11–22	–
	pussytoes	ANTEN	<i>Antennaria</i>	11–22	–
	rush skeletonplant	LYJU	<i>Lygodesmia juncea</i>	11–22	–
	leafy wildparsley	MUDI	<i>Musineon divaricatum</i>	11–22	–
	knotweed	POLYG4	<i>Polygonum</i>	11–22	–
	scurfpea	PSORA2	<i>Psoralegium</i>	11–22	–
	scarlet globemallow	SPCO	<i>Sphaeralcea coccinea</i>	11–22	–
	white heath aster	SYER	<i>Symphyotrichum ericoides</i>	11–22	–
	spiny phlox	PHHO	<i>Phlox hoodii</i>	0–11	–
	woolly plantain	PLPA2	<i>Plantago patagonica</i>	0–11	–
	white sagebrush	ARLU	<i>Artemisia ludoviciana</i>	0–11	–
	wavyleaf thistle	CIUN	<i>Cirsium undulatum</i>	0–11	–

	bladderpod	LESQU	<i>Lesquerella</i>	0–11	–
	onion	ALLIU	<i>Allium</i>	0–11	–
Shrub/Vine					
8	Shrubs			11–56	
	Subshrub (<.5m)	2SUBS	<i>Subshrub (<.5m)</i>	0–22	–
	prairie sagewort	ARFR4	<i>Artemisia frigida</i>	11–22	–
	brittle pricklypear	OPFR	<i>Opuntia fragilis</i>	11–22	–
	plains pricklypear	OPPO	<i>Opuntia polyacantha</i>	0–22	–
	broom snakeweed	GUSA2	<i>Gutierrezia sarothrae</i>	0–11	–

Table 9. Community 2.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production (Kg/Hectare)	Foliar Cover (%)
Grass/Grasslike					
1	Wheatgrass			22–67	
	western wheatgrass	PASM	<i>Pascopyrum smithii</i>	22–67	–
	thickspike wheatgrass	ELLAL	<i>Elymus lanceolatus</i> ssp. <i>lanceolatus</i>	0–13	–
2	Short Warm-Season			90–179	
	blue grama	BOGR2	<i>Bouteloua gracilis</i>	67–157	–
	saltgrass	DISP	<i>Distichlis spicata</i>	4–31	–
3	Short Cool-Season			22–90	
	Sandberg bluegrass	POSE	<i>Poa secunda</i>	22–90	–
	prairie Junegrass	KOMA	<i>Koeleria macrantha</i>	4–22	–
4	Other Native Grasses			0–18	
	Graminoid (grass or grass-like)	2GRAM	<i>Graminoid (grass or grass-like)</i>	0–13	–
	tumblegrass	SCPA	<i>Schedonnardus paniculatus</i>	0–9	–
	needle and thread	HECOC8	<i>Hesperostipa comata</i> ssp. <i>comata</i>	0–4	–
5	Grass-Likes			0–4	
	Grass-like (not a true grass)	2GL	<i>Grass-like (not a true grass)</i>	0–4	–
	needleleaf sedge	CADU6	<i>Carex duriuscula</i>	0–4	–
Forb					
7	Forbs			22–45	
	Forb (herbaceous, not grass nor grass-like)	2FORB	<i>Forb (herbaceous, not grass nor grass-like)</i>	4–18	–
	knotweed	POLYG4	<i>Polygonum</i>	4–13	–
	scurfpea	PSORA2	<i>Psoralegium</i>	4–9	–
	scarlet globemallow	SPCO	<i>Sphaeralcea coccinea</i>	4–9	–
	white heath aster	SYER	<i>Symphyotrichum ericoides</i>	4–9	–
	yellow salsify	TRDU	<i>Tragopogon dubius</i>	0–9	–
	woolly plantain	PLPA2	<i>Plantago patagonica</i>	4–9	–
	pussytoes	ANTEN	<i>Antennaria</i>	4–9	–
	white sagebrush	ARLU	<i>Artemisia ludoviciana</i>	4–9	–
	Forb, perennial	2FP	<i>Forb, perennial</i>	0–9	–
	western yarrow	ACMIO	<i>Achillea millefolium</i> var.	4–9	–

	western yarrow	ACMIU	<i>Achillea millefolium</i> var. <i>occidentalis</i>	4–9	–
	curlycup gumweed	GRSQ	<i>Grindelia squarrosa</i>	0–9	–
	bladderpod	LESQU	<i>Lesquerella</i>	4–9	–
	rush skeletonplant	LYJU	<i>Lygodesmia juncea</i>	0–4	–
	leafy wildparsley	MUDI	<i>Musineon divaricatum</i>	0–4	–
	spiny phlox	PHHO	<i>Phlox hoodii</i>	0–4	–
	onion	ALLIU	<i>Allium</i>	0–4	–
	wavyleaf thistle	CIUN	<i>Cirsium undulatum</i>	0–4	–
Shrub/Vine					
8	Shrubs			22–45	
	brittle pricklypear	OPFR	<i>Opuntia fragilis</i>	13–45	–
	plains pricklypear	OPPO	<i>Opuntia polyacantha</i>	4–36	–
	prairie sagewort	ARFR4	<i>Artemisia frigida</i>	4–22	–
	broom snakeweed	GUSA2	<i>Gutierrezia sarothrae</i>	0–22	–
	Subshrub (<.5m)	2SUBS	<i>Subshrub (<.5m)</i>	0–9	–

Table 10. Community 3.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production (Kg/Hectare)	Foliar Cover (%)
Grass/Grasslike					
1	Wheatgrass			135–224	
	western wheatgrass	PASM	<i>Pascopyrum smithii</i>	90–224	–
	thickspike wheatgrass	ELLAL	<i>Elymus lanceolatus</i> ssp. <i>lanceolatus</i>	0–45	–
2	Short Warm-Season			90–179	
	blue grama	BOGR2	<i>Bouteloua gracilis</i>	90–179	–
	saltgrass	DISP	<i>Distichlis spicata</i>	0–45	–
3	Short Cool-Season			45–90	
	Sandberg bluegrass	POSE	<i>Poa secunda</i>	45–90	–
	prairie Junegrass	KOMA	<i>Koeleria macrantha</i>	9–27	–
4	Other Native Grasses			27–90	
	needle and thread	HECOC8	<i>Hesperostipa comata</i> ssp. <i>comata</i>	18–90	–
	Graminoid (grass or grass-like)	2GRAM	<i>Graminoid (grass or grass-like)</i>	9–45	–
	Nuttall's alkaligrass	PUNU2	<i>Puccinellia nuttalliana</i>	0–27	–
	tumblegrass	SCPA	<i>Schedonnardus paniculatus</i>	0–27	–
5	Grass-Likes			18–72	
	needleleaf sedge	CADU6	<i>Carex duriuscula</i>	18–72	–
	Grass-like (not a true grass)	2GL	<i>Grass-like (not a true grass)</i>	0–45	–
Forb					
6	Non-Native Grasses			45–108	
	Kentucky bluegrass	POPR	<i>Poa pratensis</i>	18–90	–
	smooth brome	BRIN2	<i>Bromus inermis</i>	0–45	–
	cheatgrass	BRTE	<i>Bromus tectorum</i>	0–45	–
	crested wheatgrass	AGCR	<i>Agropyron cristatum</i>	0–18	–

7	Forbs			45–90	
	Forb (herbaceous, not grass nor grass-like)	2FORB	<i>Forb (herbaceous, not grass nor grass-like)</i>	0–36	–
	scurfpea	PSORA2	<i>Psoralea</i>	9–27	–
	white heath aster	SYER	<i>Symphyotrichum ericoides</i>	9–27	–
	yellow salsify	TRDU	<i>Tragopogon dubius</i>	0–27	–
	scarlet globemallow	SPCO	<i>Sphaeralcea coccinea</i>	9–18	–
	Forb, perennial	2FP	<i>Forb, perennial</i>	0–18	–
	western yarrow	ACMIO	<i>Achillea millefolium</i> var. <i>occidentalis</i>	0–18	–
	knotweed	POLYG4	<i>Polygonum</i>	9–18	–
	white sagebrush	ARLU	<i>Artemisia ludoviciana</i>	9–18	–
	wavyleaf thistle	CIUN	<i>Cirsium undulatum</i>	0–9	–
	curlycup gumweed	GRSQ	<i>Grindelia squarrosa</i>	0–9	–
	bladderpod	LESQU	<i>Lesquerella</i>	0–9	–
	rush skeletonplant	LYJU	<i>Lygodesmia juncea</i>	0–9	–
	leafy wildparsley	MUDI	<i>Musineon divaricatum</i>	0–9	–
	spiny phlox	PHHO	<i>Phlox hoodii</i>	0–9	–
	woolly plantain	PLPA2	<i>Plantago patagonica</i>	0–9	–
	onion	ALLIU	<i>Allium</i>	0–9	–
	pussytoes	ANTEN	<i>Antennaria</i>	0–9	–
Shrub/Vine					
8	Shrubs			18–45	
	prairie sagewort	ARFR4	<i>Artemisia frigida</i>	9–45	–
	brittle pricklypear	OPFR	<i>Opuntia fragilis</i>	9–45	–
	plains pricklypear	OPPO	<i>Opuntia polyacantha</i>	0–27	–
	broom snakeweed	GUSA2	<i>Gutierrezia sarothrae</i>	0–27	–
	Subshrub (<.5m)	2SUBS	<i>Subshrub (<.5m)</i>	0–18	–

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 D. Infiltration varies from moderate to very slow and runoff potential varies from medium to very high depending on soil hydrologic group and ground cover. In many cases, areas with greater than 75% ground cover

have the greatest potential for high infiltration and lower runoff. An exception would be where short grasses form a dense sod and dominate 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 and hydrologic curves).

Recreational uses

This site provides hunting opportunities for upland game species.

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.

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>)

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

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Contributors

Jeff Printz

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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	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.

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

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

4. **Bare ground from Ecological Site Description or other studies (rock, litter, lichen, moss, plant canopy are not bare ground):** Bare ground is 10 to 35% with patch size up to 6 inches and disconnected.

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

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

7. **Amount of litter movement (describe size and distance expected to travel):** Plant litter associated with slick spots may be moved following rain events, small plant litter may move 4 to 8 inches and small accumulations of plant litter may be visible.

8. **Soil surface (top few mm) resistance to erosion (stability values are averages - most sites will show a range of values):** Average rating of 3 to 6. Soil surface fragments will typically retain structure indefinitely when dipped in distilled water. Biological crusts and/or physical crusts may be present.

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.

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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):** No compaction layer evident. Naturally occurring compaction layer ("claypan") and some platy surface structure is expected for this site.
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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, cool-season rhizomatous grasses = short, warm-season grasses >
- Sub-dominant: Forbs >
- Other: Short, cool-season grasses = grass-like = shrubs = mid cool-season bunchgrasses
- 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):** None.
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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 = 1000 lbs./ac with a range of 500 to 1300 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 brome grass
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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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