

Ecological site R064XY029NE Sandy Lowland

Accessed: 04/20/2024

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.

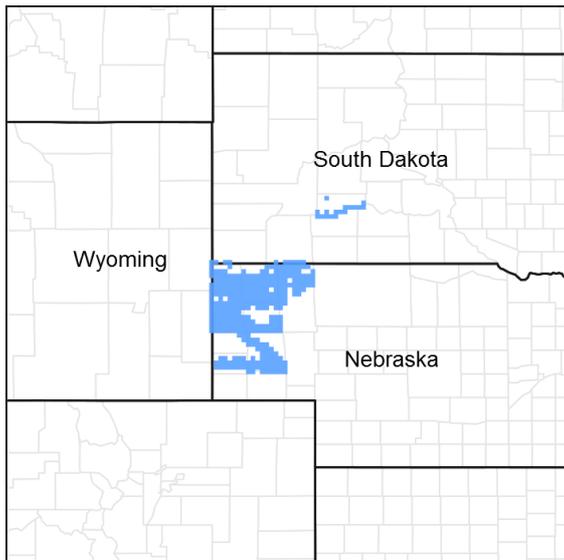


Figure 1. Mapped extent

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: 25a – Pine Ridge Escarpment, 43h – White River Badlands, and 43i – Keya Paha Tablelands.

Associated sites

R064XY011NE	Sandy 14-17" PZ
R064XY024NE	Subirrigated
R064XY032NE	Sandy 17-20" PZ

Similar sites

R064XY032NE	Sandy 17-20" PZ [Less switchgrass; lower production.]
R064XY024NE	Subirrigated [Less switchgrass; lower production.]
R064XY011NE	Sandy 14-17" PZ [Cordgrass present; higher production.]

Table 1. Dominant plant species

Tree	Not specified
Shrub	Not specified
Herbaceous	(1) <i>Andropogon hallii</i> (2) <i>Calamovilfa longifolia</i>

Physiographic features

This site occurs on nearly level flood plains and alluvial fans adjacent to streams, springs and ponds.

Table 2. Representative physiographic features

Landforms	(1) Alluvial fan (2) Stream terrace (3) Flood plain
Flooding duration	Very brief (4 to 48 hours) to brief (2 to 7 days)
Flooding frequency	Rare to frequent
Ponding frequency	None
Elevation	2,900–4,000 ft
Slope	0–3%
Water table depth	36–72 in
Aspect	Aspect is not a significant factor

Climatic features

MLRA 64 is considered to have a continental climate – cold winters and hot summers, low humidity, light rainfall, and much sunshine. Extremes in temperature may also abound. The climate is the result of this MLRA's location near the geographic center of North America. There are few natural barriers on the northern Great Plains and air masses move freely across the plains and account for rapid changes in temperature.

Annual precipitation ranges from 14 to 20 inches per year. The normal average annual temperature is about 47° F. January is the coldest month with average temperatures ranging from about 21° F (Wood, SD) to about 25° F (Hemingford, NE). July is the warmest month with temperatures averaging from about 70° F (Keeline 3 W, WY) to about 76° F (Wood, SD). The range of normal average monthly temperatures between the coldest and warmest months is about 55° F. This large annual range attests to the continental nature of this area's climate. Hourly 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 cool season plants begins in early to mid March, slowing or ceasing in late June. Warm season plants begin growth about mid May and continue to early or mid September. Green up of cool season plants may occur in September and October when adequate soil moisture is present.

Table 3. Representative climatic features

Frost-free period (average)	129 days
Freeze-free period (average)	150 days
Precipitation total (average)	17 in

Influencing water features

No riparian areas or wetland features are directly associated with this site.

Soil features

The features common to soils in this site are the very fine sandy loam to loamy fine sand textured surface soils and slopes of 0 to 3 percent. These soils have water tables below the surface for all of the growing season. The water table is non-saline and non-alkaline. The soils in this site are somewhat poorly drained to well drained and formed in loamy or sandy alluvium. The surface layer is 4 to 8 inches thick. The texture of the subsurface layers ranges from loam to sand. This site should show no evidence of rills, wind scoured areas or pedestalled plants. Water flow paths are typically indistinguishable. The soil surface is stable and intact. Sub-surface soil layers are not restrictive to water movement and root penetration.

More information can be found in the various soil survey reports. Contact the local USDA Service Center for soil survey reports that include more detail specific to your location.

Table 4. Representative soil features

Surface texture	(1) Fine sandy loam (2) Loamy fine sand (3) Loamy very fine sand
Family particle size	(1) Sandy
Drainage class	Somewhat poorly drained to well drained
Permeability class	Moderately rapid to very rapid
Soil depth	80 in
Surface fragment cover <=3"	0%
Surface fragment cover >3"	0%
Available water capacity (0-40in)	3-6 in
Calcium carbonate equivalent (0-40in)	0-10%
Electrical conductivity (0-40in)	0-4 mmhos/cm
Sodium adsorption ratio (0-40in)	0-6
Soil reaction (1:1 water) (0-40in)	5.1-8.4
Subsurface fragment volume <=3" (Depth not specified)	0-6%
Subsurface fragment volume >3" (Depth not specified)	0%

Ecological dynamics

This site developed under Northern Great Plains climatic conditions, light to severe grazing by bison and other large herbivores, sporadic natural or man-caused wildfire (often of light intensities), and other biotic and abiotic factors that typically influence soil/site development. Changes will occur in the plant communities due to short-term weather variations, impacts of native and/or exotic plant and animal species, and management actions. While the following plant community descriptions describe more typical transitions between communities that will occur, severe disturbances, such as periods of well-below average precipitation, can cause significant shifts in plant communities and/or species composition.

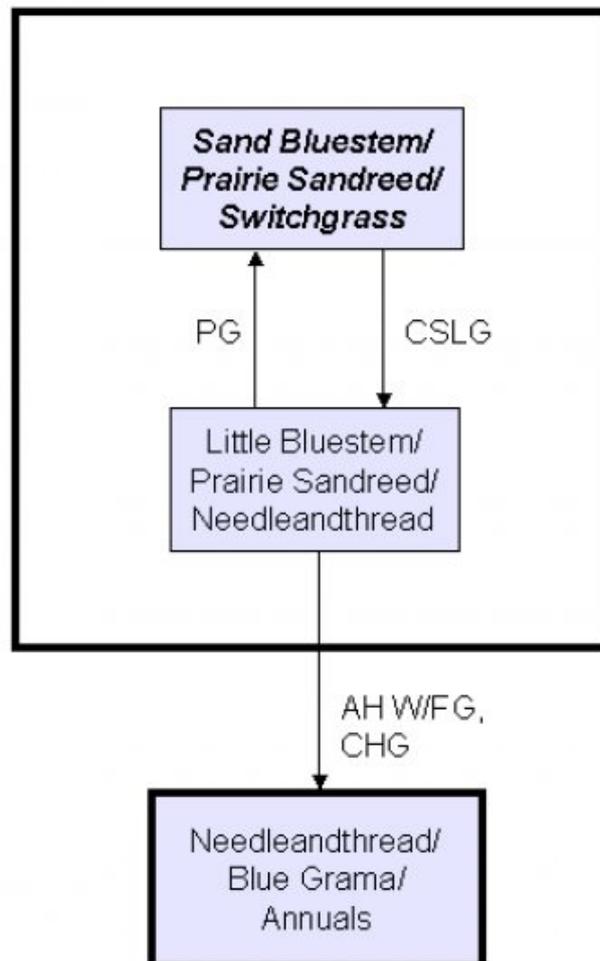
This site includes depressional areas, which allow for deep-rooted native warm season grasses to utilize subsurface moisture. It is often a transitional area between Sandy and Subirrigated sites. If management common to Subirrigated sites extends onto Sandy Lowland sites, the plant community can quickly shift due to the limited availability of subsoil moisture. Under favorable vegetative management treatments the site can return to the Sand Bluestem/Prairie Sandreed/Switchgrass Plant Community.

Sand sagebrush occurs more frequently in the western portion of the MLRA, and decreases significantly in the central and eastern portion of the MLRA. Little bluestem occurs mainly in the central and eastern portions of the MLRA, and decreases as you move west. As this site deteriorates, species such as prairie sandreed, little bluestem, sand dropseed and blue grama will increase initially. Species such as sand bluestem and switchgrass will decrease in frequency and production. With continued improper management, prairie sandreed and little bluestem will also decrease with a significant increase in cool season grasses and forbs.

Interpretations are primarily based on the Sand Bluestem/Prairie Sandreed/Switchgrass Plant Community. It 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 used. Plant communities, states, transitional pathways, and thresholds have been determined through similar studies and experience.

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



AH W/FG - Annual haying with fall grazing; **CHG** - Continuous heavy grazing (heavy levels of grazing of a unit during most or all of the growing season); **CSLG** - Continuous season-long grazing (grazing of a unit for an entire growing season); **PG** - Prescribed grazing (planned, controlled harvest of vegetation with grazing or browsing animals – see FOTG, Section IV, 528).

Community 1.1

Sand Bluestem/Prairie Sandreed /Switchgrass

Interpretations are based primarily on the Sand Bluestem/Prairie Sandreed/Switchgrass Plant Community (this is also considered to be climax). This plant community is found on areas that are properly managed with grazing and or prescribed burning. Harvesting hay biennially at a different time during the growing season will allow this plant community to persist. The potential vegetation is about 90% grasses, 5% forbs and 5% woody plants. Tall, warm-season grasses predominate. The major grasses include Sand bluestem, prairie sandreed, switchgrass and little bluestem. Other grasses occurring in this plant community include needleandthread, Indiangrass, hairy and blue grama, and grass-like including sedges. This plant community is extremely resilient and well adapted to the Northern Great Plains climatic conditions. The diversity in plant species allows for high drought tolerance. Plant litter is properly distributed with very little movement off-site and natural plant mortality is very low. This is a healthy and sustainable plant community (site/soil stability, watershed function and biologic integrity).

Table 5. Annual production by plant type

Plant Type	Low (Lb/Acre)	Representative Value (Lb/Acre)	High (Lb/Acre)
Grass/Grasslike	2075	2340	2790
Forb	125	195	275
Shrub/Vine	0	65	135
Total	2200	2600	3200

Figure 7. Plant community growth curve (percent production by month). NE6410, Pine Ridge/Badlands, lowland warm-season dominant. Warm-season dominant, lowland.

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
		3	7	15	25	25	17	6	2		

State 2

Little Bluestem/Prairie Sandreed/Needleandthread

Community 2.1

Little Bluestem/Prairie Sandreed/Needleandthread

Plants resistant to grazing are maintaining themselves in this plant community which developed under grazing by domestic livestock. Most of the palatable plants from the Sand Bluestem/Prairie Sandreed/Switchgrass Plant Community are present but occur in lesser amounts. The potential vegetation is about 85% grasses or grass-like plants, 10% forbs and 5% shrubs. Dominant grasses include prairie sandreed and little bluestem. Grasses of secondary importance include blue or hairy grama, needleandthread, sand dropseed and western wheatgrass. Forbs commonly found in this plant community include cudweed sagewort, heath aster, goldenrod, verbena, and western ragweed. Indiangrass is no longer present, and sand bluestem and perennial forbs are present in lesser amounts. This plant community has a higher percentage of cool season grasses and forbs than the Sand Bluestem/Prairie Sandreed/Switchgrass Plant Community. Lesser amounts of desirable tall warm season grasses reduces production and the community's ability to increase production in favorable years. The soil surface has remained intact. This plant community is considered stable, but is at risk if a major shift in climate or overgrazing occurs. The resiliency of this plant community is moderate depending on the intensity and duration of disturbance. Infiltration and runoff are not greatly affected due to the nature of the soil. The close proximity of this site to the Subirrigated ecological site often leads to identical management scenarios on both areas. The lack of subsoil moisture reduces the ability of the Sandy Lowland site grasses to adequately recover from annual mowing to maintain plant vigor and health. One option is to hay this site biennially, and graze the site every fall in conjunction with the Subirrigated site. Fencing along ecological site boundaries provides additional management scenarios on both Subirrigated and Sandy Lowland sites. This option should be considered if adequate water facilities exist.

Table 6. Annual production by plant type

Plant Type	Low (Lb/Acre)	Representative Value (Lb/Acre)	High (Lb/Acre)
Grass/Grasslike	1605	1750	1890
Shrub/Vine	0	100	205
Forb	95	150	205
Total	1700	2000	2300

Figure 9. Plant community growth curve (percent production by month). NE6409, Pine Ridge/Badlands, warm-season dominant, cool-season sub-dominant. Warm-season dominant, cool-season sub-dominant, lowlands.

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
		3	8	18	27	23	12	6	3		

State 3 Needleandthread/Blue Grama/Annuals

Community 3.1 Needleandthread/Blue Grama/Annuals

This plant community develops with heavy livestock grazing, usually season-long, or with annual haying followed by fall grazing. Plant diversity is diminished as the bluestems, prairie sandreed and switchgrass are removed from the plant community. Small isolated plants may exist in a prostrate form to avoid defoliation. The potential vegetation is about 80% grass or grass-like plants, 10% forbs and 10% shrubs. Dominate grasses include needleandthread, blue or hairy grama, and sand dropseed. Other grasses or grass-likes include annual brome, Kentucky bluegrass, prairie junegrass, Scribner panicum, western wheatgrass and sedges. Dominant forbs include western ragweed, verbena, cudweed sagewort, thistle and heath aster. Plant diversity is low. Sand sagebrush shows significant increase in the western portion of the MLRA, with cactus and rose showing the most increase in the central and eastern portions of the MLRA. Annual haying delays the increase of sand sagebrush and rose, but increases the cactus component in this community. This plant community is fairly resistant to change. If disturbed, it is not resilient due to the low species diversity. Soil erosion is low. The water cycle is reduced because of the lack of surface litter. Infiltration is moderate due to soil texture, which also reduces runoff.

Table 7. Annual production by plant type

Plant Type	Low (Lb/Acre)	Representative Value (Lb/Acre)	High (Lb/Acre)
Grass/Grasslike	1325	1360	1385
Forb	75	160	250
Shrub/Vine	0	80	165
Total	1400	1600	1800

Figure 11. Plant community growth curve (percent production by month). NE6407, Pine Ridge/Badlands, cool-season dominant, warm-season sub-dominant. Cool-season dominant, warm-season sub-dominant, lowland.

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
		5	8	25	30	15	10	2	5		

Additional community tables

Table 8. Community 1.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production (Lb/Acre)	Foliar Cover (%)
Grass/Grasslike					
1	Tall & Mid Warm-Season			1300-2340	

1 Native Grasses and Grass-Likes				1000-2500	
	sand bluestem	ANHA	<i>Andropogon hallii</i>	520-1040	-
	prairie sandreed	CALO	<i>Calamovilfa longifolia</i>	390-780	-
	little bluestem	SCSC	<i>Schizachyrium scoparium</i>	390-780	-
	switchgrass	PAVI2	<i>Panicum virgatum</i>	260-520	-
2	Native Grasses and Grass-Likes			130-650	
	needle and thread	HECOC8	<i>Hesperostipa comata ssp. comata</i>	130-390	-
	blue grama	BOGR2	<i>Bouteloua gracilis</i>	0-260	-
	hairy grama	BOHI2	<i>Bouteloua hirsuta</i>	0-130	-
	sedge	CAREX	<i>Carex</i>	26-130	-
	purple lovegrass	ERSP	<i>Eragrostis spectabilis</i>	0-130	-
	sand lovegrass	ERTR3	<i>Eragrostis trichodes</i>	0-130	-
	western wheatgrass	PASM	<i>Pascopyrum smithii</i>	0-130	-
	Indiangrass	SONU2	<i>Sorghastrum nutans</i>	0-130	-
	sand dropseed	SPCR	<i>Sporobolus cryptandrus</i>	0-130	-
	Grass, perennial	2GP	<i>Grass, perennial</i>	0-130	-
	prairie Junegrass	KOMA	<i>Koeleria macrantha</i>	0-52	-
	thin paspalum	PASE5	<i>Paspalum setaceum</i>	0-52	-
	Scribner's rosette grass	DIOLS	<i>Dichantherium oligosanthes var. scribnerianum</i>	0-52	-
Forb					
4	Forbs			130-260	
	beardtongue	PENST	<i>Penstemon</i>	0-52	-
	goldenrod	SOLID	<i>Solidago</i>	0-52	-
	white heath aster	SYER	<i>Symphotrichum ericoides</i>	0-52	-
	Forb, perennial	2FP	<i>Forb, perennial</i>	0-52	-
	purple prairie clover	DAPU5	<i>Dalea purpurea</i>	0-52	-
	dotted blazing star	LIPU	<i>Liatris punctata</i>	0-52	-
	lacy tansyaster	MAPI	<i>Machaeranthera pinnatifida</i>	0-26	-
	evening primrose	OENOT	<i>Oenothera</i>	0-26	-
	larkspur	DELPH	<i>Delphinium</i>	0-26	-
	stiff sunflower	HEPA19	<i>Helianthus pauciflorus</i>	0-26	-
	Cuman ragweed	AMPS	<i>Ambrosia psilostachya</i>	0-26	-
	white sagebrush	ARLU	<i>Artemisia ludoviciana</i>	0-26	-
	false boneset	BREU	<i>Brickellia eupatorioides</i>	0-26	-
	vervain	VERBE	<i>Verbena</i>	0-26	-
	upright prairie coneflower	RACO3	<i>Ratibida columnifera</i>	0-26	-
	Forb, annual	2FA	<i>Forb, annual</i>	0-26	-
Shrub/Vine					
5	Shrubs			0-130	
	Subshrub (<.5m)	2SUBS	<i>Subshrub (<.5m)</i>	0-78	-
	leadplant	AMCA6	<i>Amorpha canescens</i>	0-52	-
	rose	ROSA5	<i>Rosa</i>	0-52	-
	sand sagebrush	ARFI2	<i>Artemisia filifolia</i>	0-26	-

Table 9. Community 2.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production (Lb/Acre)	Foliar Cover (%)
Grass/Grasslike					
1	Tall & Mid Warm-Season			400–1000	
	little bluestem	SCSC	<i>Schizachyrium scoparium</i>	100–600	–
	prairie sandreed	CALO	<i>Calamovilfa longifolia</i>	100–400	–
	switchgrass	PAVI2	<i>Panicum virgatum</i>	100–200	–
	sand bluestem	ANHA	<i>Andropogon hallii</i>	100–200	–
2	Native Grasses and Grass-likes			300–900	
	needle and thread	HECOC8	<i>Hesperostipa comata ssp. comata</i>	100–300	–
	blue grama	BOGR2	<i>Bouteloua gracilis</i>	100–300	–
	sand dropseed	SPCR	<i>Sporobolus cryptandrus</i>	20–200	–
	western wheatgrass	PASM	<i>Pascopyrum smithii</i>	0–200	–
	hairy grama	BOHI2	<i>Bouteloua hirsuta</i>	0–100	–
	sedge	CAREX	<i>Carex</i>	20–100	–
	Scribner's rosette grass	DIOLS	<i>Dichanthelium oligosanthes var. scribnerianum</i>	0–100	–
	Grass, perennial	2GP	<i>Grass, perennial</i>	0–100	–
	thin paspalum	PASE5	<i>Paspalum setaceum</i>	0–40	–
	prairie Junegrass	KOMA	<i>Koeleria macrantha</i>	0–20	–
	purple lovegrass	ERSP	<i>Eragrostis spectabilis</i>	0–20	–
	sand lovegrass	ERTR3	<i>Eragrostis trichodes</i>	0–20	–
	Indiangrass	SONU2	<i>Sorghastrum nutans</i>	0–20	–
3	Non-Native Grasses			0–100	
	cheatgrass	BRTE	<i>Bromus tectorum</i>	0–100	–
	bluegrass	POA	<i>Poa</i>	0–100	–
Forb					
4	Forbs			100–200	
	white heath aster	SYER	<i>Symphotrichum ericoides</i>	0–100	–
	vervain	VERBE	<i>Verbena</i>	0–100	–
	Cuman ragweed	AMPS	<i>Ambrosia psilostachya</i>	0–100	–
	white sagebrush	ARLU	<i>Artemisia ludoviciana</i>	0–60	–
	Forb, annual	2FA	<i>Forb, annual</i>	0–40	–
	Forb, perennial	2FP	<i>Forb, perennial</i>	0–40	–
	goldenrod	SOLID	<i>Solidago</i>	0–40	–
	false boneset	BREU	<i>Brickellia eupatorioides</i>	0–20	–
	thistle	CIRSI	<i>Cirsium</i>	0–20	–
	purple prairie clover	DAPU5	<i>Dalea purpurea</i>	0–20	–
	larkspur	DELPH	<i>Delphinium</i>	0–20	–
	stiff sunflower	HEPA19	<i>Helianthus pauciflorus</i>	0–20	–
	dotted blazing star	LIPU	<i>Liatris punctata</i>	0–20	–
	lacy tansyaster	MAPI	<i>Machaeranthera pinnatifida</i>	0–20	–
	evening primrose	OENOT	<i>Oenothera</i>	0–20	–

	beardtongue	PENST	<i>Penstemon</i>	0–20	–
	upright prairie coneflower	RACO3	<i>Ratibida columnifera</i>	0–20	–
Shrub/Vine					
5	Shrubs			0–200	
	Subshrub (<.5m)	2SUBS	<i>Subshrub (<.5m)</i>	0–100	–
	rose	ROSA5	<i>Rosa</i>	0–60	–
	sand sagebrush	ARFI2	<i>Artemisia filifolia</i>	0–40	–
	pricklypear	OPUNT	<i>Opuntia</i>	0–40	–
	leadplant	AMCA6	<i>Amorpha canescens</i>	0–20	–

Table 10. Community 3.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production (Lb/Acre)	Foliar Cover (%)
Grass/Grasslike					
1	Tall & Mid Warm-Season			0–80	
	prairie sandreed	CALO	<i>Calamovilfa longifolia</i>	0–80	–
	little bluestem	SCSC	<i>Schizachyrium scoparium</i>	0–80	–
2	Native Grasses and Grass-likes			320–1280	
	blue grama	BOGR2	<i>Bouteloua gracilis</i>	80–400	–
	needle and thread	HECOC8	<i>Hesperostipa comata ssp. comata</i>	80–400	–
	sand dropseed	SPCR	<i>Sporobolus cryptandrus</i>	80–320	–
	western wheatgrass	PASM	<i>Pascopyrum smithii</i>	16–160	–
	sedge	CAREX	<i>Carex</i>	16–160	–
	Scribner's rosette grass	DIOLS	<i>Dichanthelium oligosanthes var. scribnerianum</i>	0–80	–
	hairy grama	BOHI2	<i>Bouteloua hirsuta</i>	0–80	–
	Grass, perennial	2GP	<i>Grass, perennial</i>	0–80	–
	prairie Junegrass	KOMA	<i>Koeleria macrantha</i>	16–80	–
	thin paspalum	PASE5	<i>Paspalum setaceum</i>	0–80	–
3	Non-Native Grasses			0–240	
	cheatgrass	BRTE	<i>Bromus tectorum</i>	0–240	–
	bluegrass	POA	<i>Poa</i>	0–240	–
Forb					
4	Forbs			80–240	
	Cuman ragweed	AMPS	<i>Ambrosia psilostachya</i>	0–240	–
	white sagebrush	ARLU	<i>Artemisia ludoviciana</i>	0–80	–
	thistle	CIRSI	<i>Cirsium</i>	0–80	–
	white heath aster	SYER	<i>Symphyotrichum ericoides</i>	0–80	–
	vervain	VERBE	<i>Verbena</i>	0–80	–
	Forb, annual	2FA	<i>Forb, annual</i>	0–48	–
	Forb, perennial	2FP	<i>Forb, perennial</i>	0–32	–
	goldenrod	SOLID	<i>Solidago</i>	0–32	–
	false boneset	BREU	<i>Brickellia eupatorioides</i>	0–16	–
	purple prairie clover	DAPU5	<i>Dalea purpurea</i>	0–16	–
	larkspur	DELPH	<i>Delphinium</i>	0–16	–
	dotted blazing star	LIPU	<i>Liatris punctata</i>	0–16	–
	lacy tansyaster	MAPI	<i>Machaeranthera pinnatifida</i>	0–16	–
	evening primrose	OENOT	<i>Oenothera</i>	0–16	–
Shrub/Vine					
5	Shrubs			0–160	
	sand sagebrush	ARFI2	<i>Artemisia filifolia</i>	0–160	–
	pricklypear	OPUNT	<i>Opuntia</i>	0–160	–
	rose	ROSA5	<i>Rosa</i>	0–80	–
	Subshrub (<.5m)	2SUBS	<i>Subshrub (<.5m)</i>	0–80	–

Hydrological functions

Moisture conditions are ideal for forage production on this site. Soils on this site are in Hydrologic Soil Group A and B. Although most of these soils are very permeable, water tables provide subirrigation of grasses and other vegetation. Surrounding upland areas tend to also have permeable soils and surface inflow peaks on these sites are often muted. These sites are rarely to occasionally flooded. Refer to Section 4, NRCS National Engineering Handbook for runoff quantities and hydrologic curves.

Recreational uses

This site provides hunting, hiking, photography, bird watching and other opportunities. The wide varieties of plants that 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 data and other inventory data. Field observations from range-trained personnel were also used. Those involved in developing this site include: Stan Boltz, Range Management Specialist, NRCS; Jill Epley, Range Management Specialist, NRCS; Rick Peterson, Range Management Specialist, NRCS; David Steffen, Range Management Specialist, NRCS; Jeff Vander Wilt; Range Management Specialist, NRCS; Phil Young, Soil Scientist, NRCS.

Other references

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

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USDA, NRCS, Various Published Soil Surveys.

Contributors

SCB

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	03/31/2004
Approved by	Stan Boltz
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 typically less than 5 percent.

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):** Litter falls in place.

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. Surface organic matter adheres to the soil surface.

9. **Soil surface structure and SOM content (include type of structure and A-horizon color and thickness):** A-horizon should be 4 to 8 inches thick with dark gray colors when moist. Structure typically is medium to fine granular in the upper A-horizon.

10. **Effect of community phase composition (relative proportion of different functional groups) and spatial distribution on infiltration and runoff:** Deep rooted species (mid and tall rhizomatous cool- and warm-season grasses and grass-like) 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: Tall, warm-season rhizomatous grasses >> mid, warm-season bunchgrasses >

Sub-dominant: Mid, cool-season grasses >

Other: Forbs = short, warm-season grasses > grass-like species = shrubs

Additional: Other grasses in other functional groups occur in minor amounts.

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.
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14. **Average percent litter cover (%) and depth (in):** Litter cover is typically 80 to 90 percent, and depth of litter ranges from 0.5 to 1 inches.
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15. **Expected annual annual-production (this is TOTAL above-ground annual-production, not just forage annual-production):** Total annual production ranges from 2,200 to 3,200 pounds/acre, with the reference values being 2,600 pounds/acre (air-dry basis).
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16. **Potential invasive (including noxious) species (native and non-native). List species which BOTH characterize degraded states and have the potential to become a dominant or co-dominant species on the ecological site if their future establishment and growth is not actively controlled by management interventions. Species that become dominant for only one to several years (e.g., short-term response to drought or wildfire) are not invasive plants. Note that unlike other indicators, we are describing what is NOT expected in the reference state for the ecological site:** State and local noxious weeds; Kentucky bluegrass may be prevalent during dry cycles, but will typically not dominate the site.
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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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