

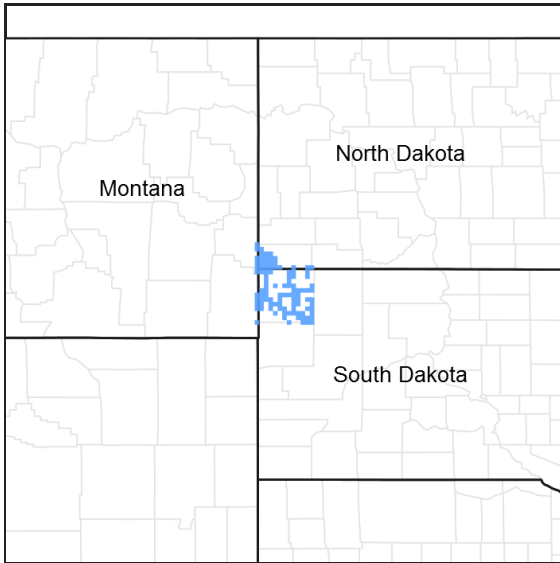
# Ecological site R058DY002SD

## Wet Land

Accessed: 05/20/2024

### 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: 43e – Sagebrush Steppe.

### Associated sites

R058DY004SD	<b>Wet Meadow</b>
R058DY007SD	<b>Saline Lowland</b>

### Similar sites

R058DY004SD	<b>Wet Meadow</b> Wet Meadow [more prairie cordgrass; more upland grasses]
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**Table 1. Dominant plant species**

Tree	Not specified
Shrub	Not specified

Herbaceous	(1) <i>Spartina pectinata</i> (2) <i>Calamagrostis canadensis</i>
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## Physiographic features

This site occurs on nearly level river valleys and uplands.

**Table 2. Representative physiographic features**

Landforms	(1) Depression (2) Oxbow (3) Slough
Flooding duration	Long (7 to 30 days)
Flooding frequency	None to frequent
Ponding duration	Brief (2 to 7 days) to very long (more than 30 days)
Ponding frequency	Frequent
Elevation	701–1,219 m
Slope	0–3%
Ponding depth	0–30 cm
Water table depth	0–46 cm
Aspect	Aspect is not a significant factor

## Climatic features

The climate in this MLRA is typical of the drier portions of the Northern Great Plains where sagebrush steppes to the west yield to grassland to the east. Annual precipitation ranges from 14 to 16 inches. Most of the rainfall occurs as frontal storms early in the growing season. Some high intensity, convective thunderstorms occur in the summer. Precipitation in winter occurs as snow. Temperatures show a wide range between summer and winter and between daily maximums and minimums, due to the high elevation and dry air, which permits rapid incoming and outgoing radiation. Outbreaks of cold air from Canada in winter move rapidly from northwest to southeast and account for extreme minimum temperatures. Extreme storms may occur during the winter, but most severely affect ranch operations during late winter and spring. The normal average annual temperature is about 44°F. January is the coldest month with average temperatures ranging from about 12°F (Marmarth, North Dakota (ND)), to about 20°F (Baker, Montana (MT)). July is the warmest month with temperatures averaging from about 70°F (Marmarth, ND), to about 76°F (Baker, MT). The range of normal average monthly temperatures between the coldest and warmest months is about 55°F. Hourly winds are estimated to average about 11 miles per hour (mph) annually, ranging from about 13 mph during the spring to about 10 mph during the summer. Daytime winds are generally stronger than nighttime and strong storms may bring brief periods of high winds with gusts to more than 50 mph.

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 can continue to early or mid-September. Greenup 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)	123 days
Freeze-free period (average)	140 days
Precipitation total (average)	406 mm

## Influencing water features

The palustrine, emergent wetland type would have a persistent sub-class designation.

## Soil features

The soils in this site are very poorly or poorly drained and formed in clayey or silty alluvium. The surface layer is five to six inches thick. The texture of the subsurface ranges from silty clay loam to silty clay. This site should show no evidence of rills, wind scoured areas, or pedestalled plants. Water flow paths are broken, irregular in appearance, or discontinuous with numerous debris dams or vegetative barriers. The soil surface is stable and intact.

Access Web Soil Survey (<http://websoilsurvey.nrcs.usda.gov/app/>) for specific local soils information.

**Table 4. Representative soil features**

Surface texture	(1) Silty clay (2) Silty clay loam
Family particle size	(1) Clayey
Drainage class	Poorly drained
Permeability class	Very slow to moderate
Soil depth	203 cm
Surface fragment cover <=3"	0%
Surface fragment cover >3"	0%
Available water capacity (0-101.6cm)	15.24–17.78 cm
Calcium carbonate equivalent (0-101.6cm)	0–30%
Electrical conductivity (0-101.6cm)	0–8 mmhos/cm
Sodium adsorption ratio (0-101.6cm)	0–13
Soil reaction (1:1 water) (0-101.6cm)	6.1–9
Subsurface fragment volume <=3" (Depth not specified)	0%
Subsurface fragment volume >3" (Depth not specified)	0%

## Ecological dynamics

This site developed under Northern Great Plains climatic conditions, natural influences of large herbivores, occasional fire, 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.

Changes will occur in the plant communities primarily due to periodic fluctuations in hydrologic cycles. As this site deteriorates, such as when excessive litter accumulates and plants become decadent, species such as spikerush and Baltic rush increase. Grasses and grass-likes such as Nebraska sedge, northern reedgrass, and bluejoint reedgrass will decrease in frequency and production. When this occurs, the plant composition will be similar to the Spikerush/Bulrush/Cattail Plant Community, but the total production will be significantly reduced.

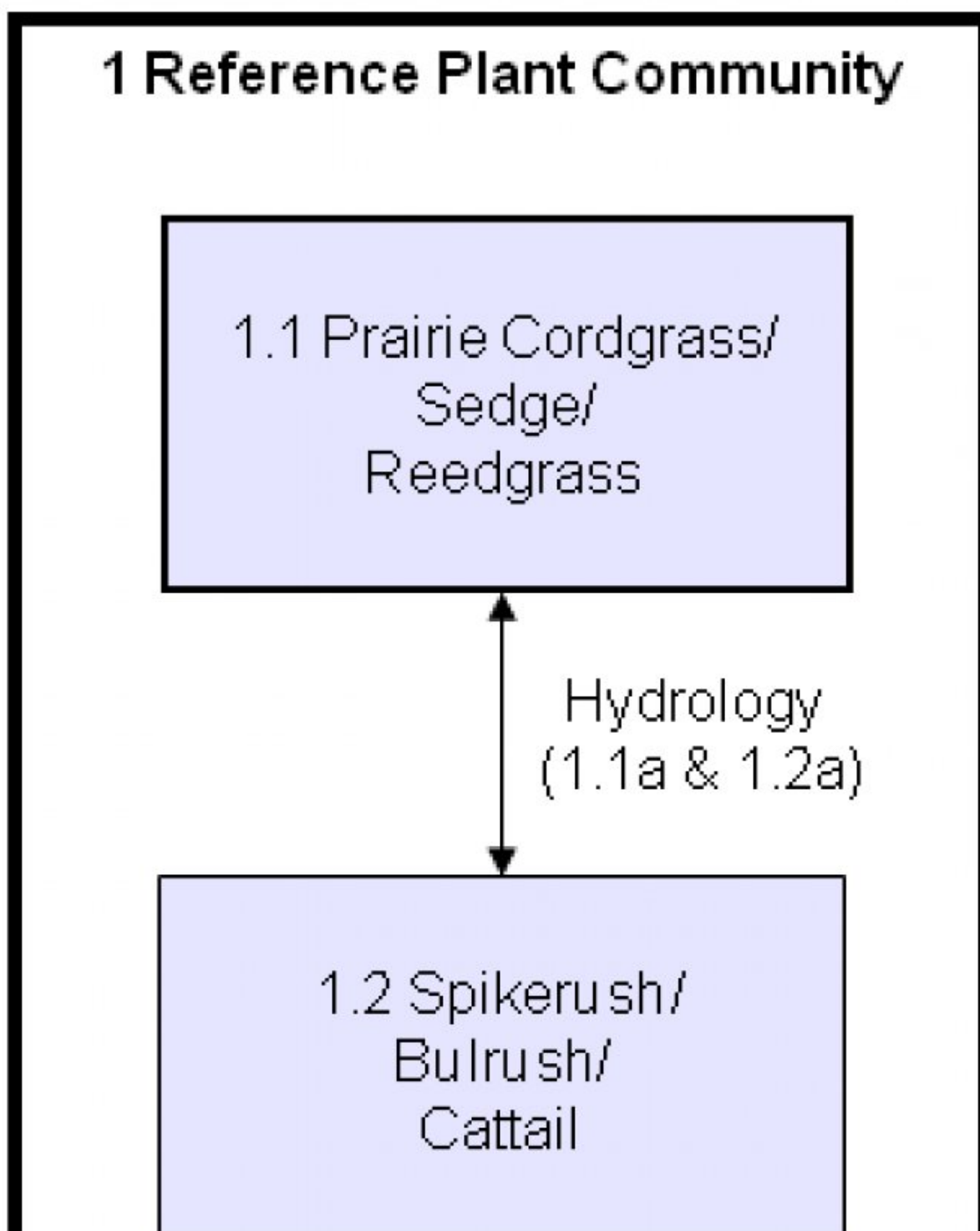
This site can be significantly impacted when used as primary watering sources by livestock and to a lesser degree, wildlife. Compaction can occur, which can lead to pedestalling and increased bare ground. This does not significantly affect composition, but can lead to reduced production.

The plant community upon which interpretations are primarily based is the Reference Plant Community. This plant

community has been determined by studying 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.

Following the state and transition diagram are narratives for each of the described states and community phases. These may not represent every possibility, but they are the most prevalent and repeatable states/community phases. The plant composition tables shown below have been developed from the best available knowledge at the time of this revision. As more data are collected, some of these community phases and/or states may be revised or removed, and new ones may be added. The main purpose for including the descriptions here is to capture the current knowledge and experience at the time of this revision.

### State and transition model



# Hydrology – Natural wet and dry cycles.

## State 1 Reference

The plant community upon which interpretations are primarily based is the Reference Plant Community. It is actually made up of two distinct plant communities, which are described further below. Potential vegetation is about 10 to 75 percent grasses, 20 to 60 percent grass-likes, 5 to 35 percent forbs, and 0 to 5 percent shrubs and/or trees. Major grasses and grass-likes include prairie cordgrass, sedge, bluejoint reedgrass, spikerush, cattail, and bulrush. Grasses and grass-likes of lesser importance are bluegrass, slender wheatgrass, Baltic rush and low-growing, unpalatable sedges, rushes and other grass-likes. The plant community is well adapted to the Northern Great Plains climatic conditions. It is a critical plant community providing water and habitat for the surrounding area. The diversity in plant species provides a variety of habitats for wildlife. It is resistant to drought due to a dependable water supply. Community dynamics, nutrient cycle, water cycle and energy flow are functioning properly. Plant litter is properly distributed with very little movement offsite and natural plant mortality is very low.

## Community 1.1 Prairie Cordgrass/Sedge/Reedgrass

This plant community occurs during the more normal to drier precipitation/hydrology cycles. During these periods, grasses become more dominant in the plant community. Grasses will make up about 50 to 75 percent, with grass-likes at 20 to 35 percent, forbs 5 to 10 percent and shrubs and/or trees at 0 to 5 percent. Dominant species are prairie cordgrass, bluejoint reedgrass, rough banyardgrass, sedge, and dock.

Table 5. Annual production by plant type

Plant Type	Low (Kg/Hectare)	Representative Value (Kg/Hectare)	High (Kg/Hectare)
Grass/Grasslike	4780	5549	6193
Forb	263	461	740
Shrub/Vine	–	155	353
<b>Total</b>	<b>5043</b>	<b>6165</b>	<b>7286</b>

Figure 5. Plant community growth curve (percent production by month). SD5808, Northern Rolling High Plains, lowland cool-season/warm-season codominant. Cool-season, Warm-season codominant, Lowland.

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0	0	4	11	19	23	20	12	6	5	0	0

## Community 1.2

## Spikerush/Bulrush/Cattail

This plant community occurs during the wetter precipitation/hydrology cycles that naturally occur on this site. During these periods, the species composition shifts to being more dominated by the grass-like species. The plant community is made up of about 10 to 35 percent grasses, 40 to 60 percent grass-likes, 15 to 35 percent forbs, and 0 to 5 percent shrubs and/or trees. Dominant species include bulrush, Baltic rush, Spikerush, and cattail.

Table 6. Annual production by plant type

Plant Type	Low (Kg/Hectare)	Representative Value (Kg/Hectare)	High (Kg/Hectare)
Grass/Grasslike	2522	3348	4579
Forb	841	1541	1793
Shrub/Vine	–	155	353
<b>Total</b>	<b>3363</b>	<b>5044</b>	<b>6725</b>

Figure 7. Plant community growth curve (percent production by month).  
SD5808, Northern Rolling High Plains, lowland cool-season/warm-season  
codominant. Cool-season, Warm-season codominant, Lowland.

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0	0	4	11	19	23	20	12	6	5	0	0

### Pathway 1.1a

#### Community 1.1 to 1.2

Hydrology cycles will shift the Reference Plant Community between the Prairie Cordgrass/Sedge/Reedgrass Plant Community and the Spikerush/Bulrush/Cattail Plant Community.

### Pathway 1.2a

#### Community 1.2 to 1.1

Hydrology cycles will shift the Reference Plant Community between the Prairie Cordgrass/Sedge/Reedgrass Plant Community and the Spikerush/Bulrush/Cattail Plant Community.

## Additional community tables

Table 7. Community 1.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production (Kg/Hectare)	Foliar Cover (%)
<b>Grass/Grasslike</b>					
1	<b>Tall Grasses</b>			3391–4007	
	prairie cordgrass	SPPE	<i>Spartina pectinata</i>	2466–3391	–
	bluejoint	CACA4	<i>Calamagrostis canadensis</i>	616–1541	–
	rough barnyardgrass	ECMU2	<i>Echinochloa muricata</i>	308–925	–
	northern reedgrass	CASTI3	<i>Calamagrostis stricta</i> ssp. <i>inexpansa</i>	123–616	–
	slimstem reedgrass	CASTS5	<i>Calamagrostis stricta</i> ssp. <i>stricta</i>	123–616	–
2	<b>Other Native Grasses</b>			308–616	
	Graminoid (grass or grass-like)	2GRAM	<i>Graminoid (grass or grass-like)</i>	0–308	–
	switchgrass	PAVI2	<i>Panicum virgatum</i>	0–308	–
	reed canarygrass	PHAR3	<i>Phalaris arundinacea</i>	0–308	–
	bluegrass	POA	<i>Poa</i>	0–308	–

	slender wheatgrass	ELIR/	<i>Elymus trachycaulus</i>	0-308	-
	foxtail barley	HOJU	<i>Hordeum jubatum</i>	0-308	-
	western wheatgrass	PASM	<i>Pascopyrum smithii</i>	0-185	-
	saltgrass	DISP	<i>Distichlis spicata</i>	0-62	-
3	<b>Grass-Likes</b>			1233-2158	
	wheat sedge	CAAT2	<i>Carex atherodes</i>	308-925	-
	Nebraska sedge	CANE2	<i>Carex nebrascensis</i>	308-925	-
	sedge	CAREX	<i>Carex</i>	308-616	-
	spikerush	ELEOC	<i>Eleocharis</i>	308-616	-
	bulrush	SCHOE6	<i>Schoenoplectus</i>	308-616	-
	rush	JUNCU	<i>Juncus</i>	0-308	-
	Grass-like (not a true grass)	2GL	<i>Grass-like (not a true grass)</i>	0-308	-
<b>Forb</b>					
4	<b>Forbs</b>			308-616	
	dock	RUMEX	<i>Rumex</i>	0-308	-
	Forb, native	2FN	<i>Forb, native</i>	62-308	-
	wild mint	MEAR4	<i>Mentha arvensis</i>	0-185	-
	stinging nettle	URDI	<i>Urtica dioica</i>	0-185	-
	broadleaf cattail	TYLA	<i>Typha latifolia</i>	0-123	-
	swamp smartweed	POHY2	<i>Polygonum hydropiperoides</i>	0-123	-
	Pennsylvania smartweed	POPE2	<i>Polygonum pensylvanicum</i>	0-123	-
	cinquefoil	POTEN	<i>Potentilla</i>	0-123	-
	white water crowfoot	RAAQ	<i>Ranunculus aquatilis</i>	0-123	-
	pale dock	RUAL4	<i>Rumex altissimus</i>	0-123	-
	swamp milkweed	ASIN	<i>Asclepias incarnata</i>	0-123	-
	aster	ASTER	<i>Aster</i>	0-123	-
	spotted water hemlock	CIMA2	<i>Cicuta maculata</i>	0-123	-
	smooth horsetail	EQLA	<i>Equisetum laevigatum</i>	0-123	-
	American licorice	GLLE3	<i>Glycyrrhiza lepidota</i>	0-123	-
<b>Shrub/Vine</b>					
5	<b>Shrubs/Trees</b>			0-308	
	willow	SALIX	<i>Salix</i>	0-247	-
	Shrub (>.5m)	2SHRUB	<i>Shrub (&gt;.5m)</i>	0-185	-
	false indigo bush	AMFR	<i>Amorpha fruticosa</i>	0-123	-
	cottonwood	POPUL	<i>Populus</i>	0-123	-

Table 8. Community 1.2 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production (Kg/Hectare)	Foliar Cover (%)
<b>Grass/Grasslike</b>					
1	<b>Tall Grasses</b>			308-1233	
	prairie cordgrass	SPPE	<i>Spartina pectinata</i>	308-925	-
	bluejoint	CACA4	<i>Calamagrostis canadensis</i>	0-616	-
	northern reedgrass	CASTI3	<i>Calamagrostis stricta</i> ssp. <i>inexpansa</i>	0-308	-

	slimstem reedgrass	CASTS5	<i>Calamagrostis stricta ssp. stricta</i>	0-308	-
	rough barnyardgrass	ECMU2	<i>Echinochloa muricata</i>	0-308	-
2	<b>Other Native Grasses</b>			308-925	
	Graminoid (grass or grass-like)	2GRAM	<i>Graminoid (grass or grass-like)</i>	0-308	-
	slender wheatgrass	ELTR7	<i>Elymus trachycaulus</i>	0-308	-
	foxtail barley	HOJU	<i>Hordeum jubatum</i>	0-308	-
	reed canarygrass	PHAR3	<i>Phalaris arundinacea</i>	0-308	-
	bluegrass	POA	<i>Poa</i>	0-308	-
	western wheatgrass	PASM	<i>Pascopyrum smithii</i>	0-62	-
	switchgrass	PAVI2	<i>Panicum virgatum</i>	0-62	-
	saltgrass	DISP	<i>Distichlis spicata</i>	0-62	-
3	<b>Grass-Likes</b>			2466-3699	
	spikerush	ELEOC	<i>Eleocharis</i>	616-1541	-
	bulrush	SCHOE6	<i>Schoenoplectus</i>	616-1233	-
	wheat sedge	CAAT2	<i>Carex atherodes</i>	308-925	-
	Nebraska sedge	CANE2	<i>Carex nebrascensis</i>	308-925	-
	rush	JUNCU	<i>Juncus</i>	308-925	-
	sedge	CAREX	<i>Carex</i>	308-616	-
	Grass-like (not a true grass)	2GL	<i>Grass-like (not a true grass)</i>	0-616	-
<b>Forb</b>					
4	<b>Forbs</b>			925-2158	
	broadleaf cattail	TYLA	<i>Typha latifolia</i>	616-1233	-
	smooth horsetail	EQLA	<i>Equisetum laevigatum</i>	123-616	-
	American licorice	GLLE3	<i>Glycyrrhiza lepidota</i>	0-308	-
	Forb, native	2FN	<i>Forb, native</i>	62-308	-
	swamp smartweed	POHY2	<i>Polygonum hydropiperoides</i>	0-308	-
	Pennsylvania smartweed	POPE2	<i>Polygonum pensylvanicum</i>	0-308	-
	dock	RUMEX	<i>Rumex</i>	0-308	-
	stinging nettle	URDI	<i>Urtica dioica</i>	0-308	-
	spotted water hemlock	CIMA2	<i>Cicuta maculata</i>	0-185	-
	pale dock	RUAL4	<i>Rumex altissimus</i>	0-185	-
	cinquefoil	POTEN	<i>Potentilla</i>	0-185	-
	swamp milkweed	ASIN	<i>Asclepias incarnata</i>	0-185	-
	wild mint	MEAR4	<i>Mentha arvensis</i>	0-185	-
	aster	ASTER	<i>Aster</i>	0-123	-
	white water crowfoot	RAAQ	<i>Ranunculus aquatilis</i>	0-123	-
<b>Shrub/Vine</b>					
5	<b>Shrubs/Trees</b>			0-308	
	willow	SALIX	<i>Salix</i>	0-247	-
	Shrub (>.5m)	2SHRUB	<i>Shrub (&gt;.5m)</i>	0-185	-
	false indigo bush	AMFR	<i>Amorpha fruticosa</i>	0-123	-
	cottonwood	POPUL	<i>Populus</i>	0-123	-



## **Animal community**

### **Animal Community – Wildlife Interpretations**

Major Land Resource Area (MLRA) 58D lies within the drier portion of Northern mixed-grass prairie ecosystem where sagebrush steppes to the west yield to grassland steppes to the east. Prior to European settlement, this area consisted of diverse grass/shrub land habitats interspersed with varying densities of depressional, in-stream wetlands, and woody riparian corridors. These habitats provided critical life cycle components for many of its users. Many species of grassland birds, small mammals, reptiles, amphibians, and herds of roaming bison, elk, and pronghorn were among the inhabitants adapted to this semi-arid region. Roaming herbivores, as well as, several small mammal and insect species, were the primary consumers linking the grassland resources to predators such as the wolf, mountain lion, and grizzly bear, as well as, smaller carnivores such as the coyote, bobcat, fox, and raptors. The black-tailed prairie dog was once abundant; however, the species remains a keystone species within its range. The black-footed ferret, burrowing owl, ferruginous hawk, mountain plover, and swift fox were associated with prairie dog complexes.

Historically, the Northern mixed-grass prairie was a disturbance-driven ecosystem with fire, herbivory, and climate functioning as the primary disturbance factors either singly or in combination. Following European settlement, livestock grazing, cropland conversion, elimination of fire, energy development, and other anthropogenic factors influenced species composition and abundance. Introduced and invasive species further impacted plant and animal communities. The bison was a historical keystone species but have been extirpated as a free-ranging herbivore. The loss of the bison, reduction of prairie dog colonies, and fire as ecological drivers greatly influenced the character of the remaining native plant communities and altered wildlife habitats. Human development has reduced habitat quality for area-sensitive species.

Within MLRA 58D, the Wet Land Ecological Site (ES) provides upland/wetland complex cover with an associated forb component. It was typically part of an expansive grassland landscape that included combinations of Shallow Loamy, Shallow Clayey, Thin Loamy, Thin Claypan, Sandy, Sandy Claypan, Loamy, Loamy Terrace, Sandy Terrace, and Clayey ESs.

The Wet Land ES has remained relatively intact but may be subject to haying under drier conditions. This site has sufficient hydrology to support hydrophytic vegetation and wildlife species associated with ponded or saturated soil conditions. This site receives surface and subsurface water from adjacent upland sites during precipitation events. The site provides important wetland habitat for birds, small rodents, bats, mammalian predators, reptiles, amphibians, and insects. These sites may provide forage sites for greater sage-grouse broods.

### **Prairie Cordgrass/Sedge/Reedgrass and Spikerush/Bulrush/Cattail:**

The dominate plant community is dependent on the hydrologic cycle (wetter or drier). The predominance of hydrophytic vegetation, including a high diversity of sedges and other grass-like species, favors shorebirds, wading birds (e.g. egrets, bitterns, and herons), waterfowl (e.g. ducks and geese), and wetland associated songbirds. This plant community provides habitat for salamanders, various frog and toad species, and various snake species. Invertebrates are an important component of the food web. Raptors such as northern harrier, short-eared owl, Swainson's hawk, and American kestrel will use this site. Prey populations are limited to small mammals such as water shrew and meadow vole and invertebrates. When associated with ecological sites dominated by big sagebrush, greater sage-grouse will use the site for brood rearing/foraging habitat.

### **Animal Community – Grazing Interpretations**

Grazing by domestic livestock is one of the major income-producing industries in the area. Rangeland in this area may provide yearlong forage. During the dormant period, the forage for livestock will likely be lacking protein to meet livestock requirements, and added protein will allow ruminants to better utilize the energy stored in grazed plant materials. A forage quality test (either directly or through fecal sampling) should be used to determine the level of supplementation needed.

## **Hydrological functions**

Water is the principal factor limiting forage production on this site. This site is dominated by soils in hydrologic groups C and D. Infiltration and runoff potential for this site varies from moderate to high depending on soil hydrologic group, slope, and ground cover. In many cases, areas with greater than 75 percent ground cover have the greatest potential for high infiltration and lower runoff. An exception would be where shortgrasses form a strong

sod and dominate the site. Normally, areas where ground cover is less than 50 percent 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 varieties of plants which bloom from spring until fall have an esthetic value that appeals to visitors.

## Wood products

No appreciable wood products are typically present on this 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 and experience were also used. Those involved in developing this site description include: Ryan Beer, Range Management Specialist (RMS), NRCS; Stan Boltz, RMS, NRCS; Dave Dewald, Wildlife Biologist, NRCS; Jody Forman, RMS, NRCS; Dennis Froemke, RMS, NRCS; Cheryl Nielsen, RMS, NRCS; Jeff Printz, RMS, NRCS; Mike Stirling, RMS, NRCS; and Darrell Vanderbusch, Soil Scientist, NRCS.

## Other references

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

USDA, NRCS. National Water and Climate Center, 101 SW Main, Suite 1600, Portland, OR 97204-3224.  
(<http://www.wcc.nrcs.usda.gov/>)

USDA, NRCS. National Range and Pasture Handbook, September 1997

USDA, NRCS. National Soil Information System, Information Technology Center, 2150 Centre Avenue, Building A, Fort Collins, CO 80526. (<http://nasis.nrcs.usda.gov>)

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

USDA, NRCS, Various Published Soil Surveys

## Contributors

Stan Boltz  
Travis Patient

## 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	05/07/2010
Approved by	Stan Boltz
Approval date	
Composition (Indicators 10 and 12) based on	Annual Production

## Indicators

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

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

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

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4. **Bare ground from Ecological Site Description or other studies (rock, litter, lichen, moss, plant canopy are not bare ground):** 0 to 5 percent is typical. During periods of above average precipitation and run-on, this site may be ponded for longer than normal durations, and typical vegetation may be temporarily reduced, creating areas of bare ground for relatively short periods of time.

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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):** Litter falls in place.

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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. This site typically has an O-horizon (roots and partly decomposed stems and leaves of plants) that is 0-3 inches thick. Surface organic matter adheres to the soil surface. 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):** A-horizon should be 12 to 24 inches thick with dark gray or gray colors when moist. Structure typically is medium to fine angular blocky in the A-horizon.

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10. **Effect of community phase composition (relative proportion of different functional groups) and spatial distribution on infiltration and runoff:** Deep rooted species (tall rhizomatous cool- and warm-season grasses and grass-likes) with fine and coarse roots positively influences infiltration. Infiltration is somewhat limited naturally due to poor drainage and relatively low permeability.

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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 – when dry, B horizons can be hard and appear to be compacted, but no platy structure will be present.
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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: Grass-likes >

Sub-dominant: Forbs > tall warm-season rhizomatous grasses > tall cool-season rhizomatous grasses >

Other: Short/mid cool-season grasses = shrubs/trees

Additional:

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13. **Amount of plant mortality and decadence (include which functional groups are expected to show mortality or decadence):** Little evidence of decadence or mortality.
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14. **Average percent litter cover (%) and depth ( in):**
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15. **Expected annual annual-production (this is TOTAL above-ground annual-production, not just forage annual-production):** Production ranges from 4,500-6,500 lbs./acre air-dry weight. Normal annual production is 5,500 lbs./acre air-dry weight.
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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. Most invasive species will occupy the perimeter of this 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 and grass-likes should have vigorous rhizomes or tillers.
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