USDA Natural Resources Conservation Service

Ecological site R058DY007SD
Saline Lowland

Accessed: 05/06/2024

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.

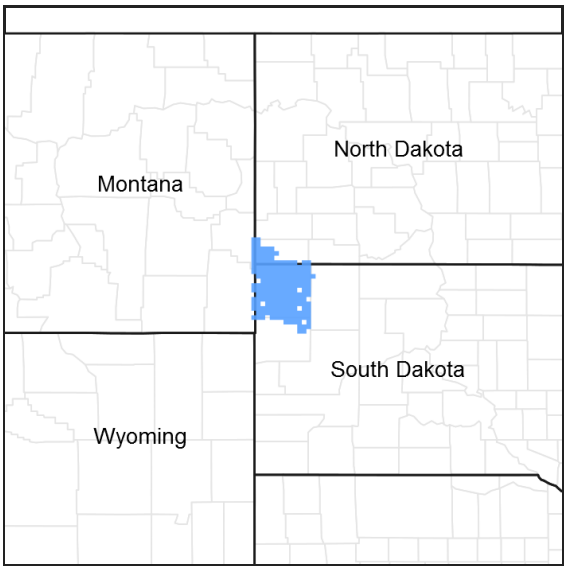


Figure 1. Mapped extent

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	**Wet Meadow**
R058DY013SD	**Claypan**
R058DY020SD	**Loamy Overflow**

Similar sites

R058DY020SD	**Loamy Overflow** Loamy Overflow [big bluestem dominant; less salts; no water table]

Table 1. Dominant plant species

Tree	Not specified
Shrub	Not specified

Herbaceous	(1) *Pascopyrum smithii* (2) *Puccinellia nuttalliana*

Physiographic features

This site occurs on nearly level to gently sloping drainages.

Table 2. Representative physiographic features

Landforms	(1) Swale (2) Flood plain
Flooding duration	Very brief (4 to 48 hours) to brief (2 to 7 days)
Flooding frequency	Occasional
Ponding frequency	None
Elevation	701–1,219 m
Slope	0–3%
Water table depth	61–91 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 occasional 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

No significant water features influence this site.

Soil features

The soils of this site are deep and poorly drained and formed in alluvium. These soils have very slow to moderately slow permeability and are moderately to strongly saline. Higher soluble salt concentrations may be found in the subsoil. The surface soil varies from three to five inches in thickness. The surface texture is loam or fine sandy loam. A fluctuating water table occurs in these areas and ranges from one to three feet. The water table is within reach of plants during most of the growing season. These areas are subject to occasional overflow. This site could show slight to moderate evidence of rills and/or pedestalled plants. Water flow paths are somewhat continuous, but irregular in appearance with few debris dams or vegetative barriers.

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

Table 4. Representative soil features

Surface texture	(1) Fine sandy loam (2) Loam
Family particle size	(1) Loamy
Drainage class	Poorly drained
Permeability class	Very slow to moderately slow
Soil depth	203 cm
Surface fragment cover <=3"	0–5%
Surface fragment cover >3"	0%
Available water capacity (0-101.6cm)	10.16–12.7 cm
Calcium carbonate equivalent (0-101.6cm)	0–25%
Electrical conductivity (0-101.6cm)	8–32 mmhos/cm
Sodium adsorption ratio (0-101.6cm)	0–5
Soil reaction (1:1 water) (0-101.6cm)	5.1–9
Subsurface fragment volume <=3" (Depth not specified)	0–5%
Subsurface fragment volume >3" (Depth not specified)	0%

Ecological dynamics

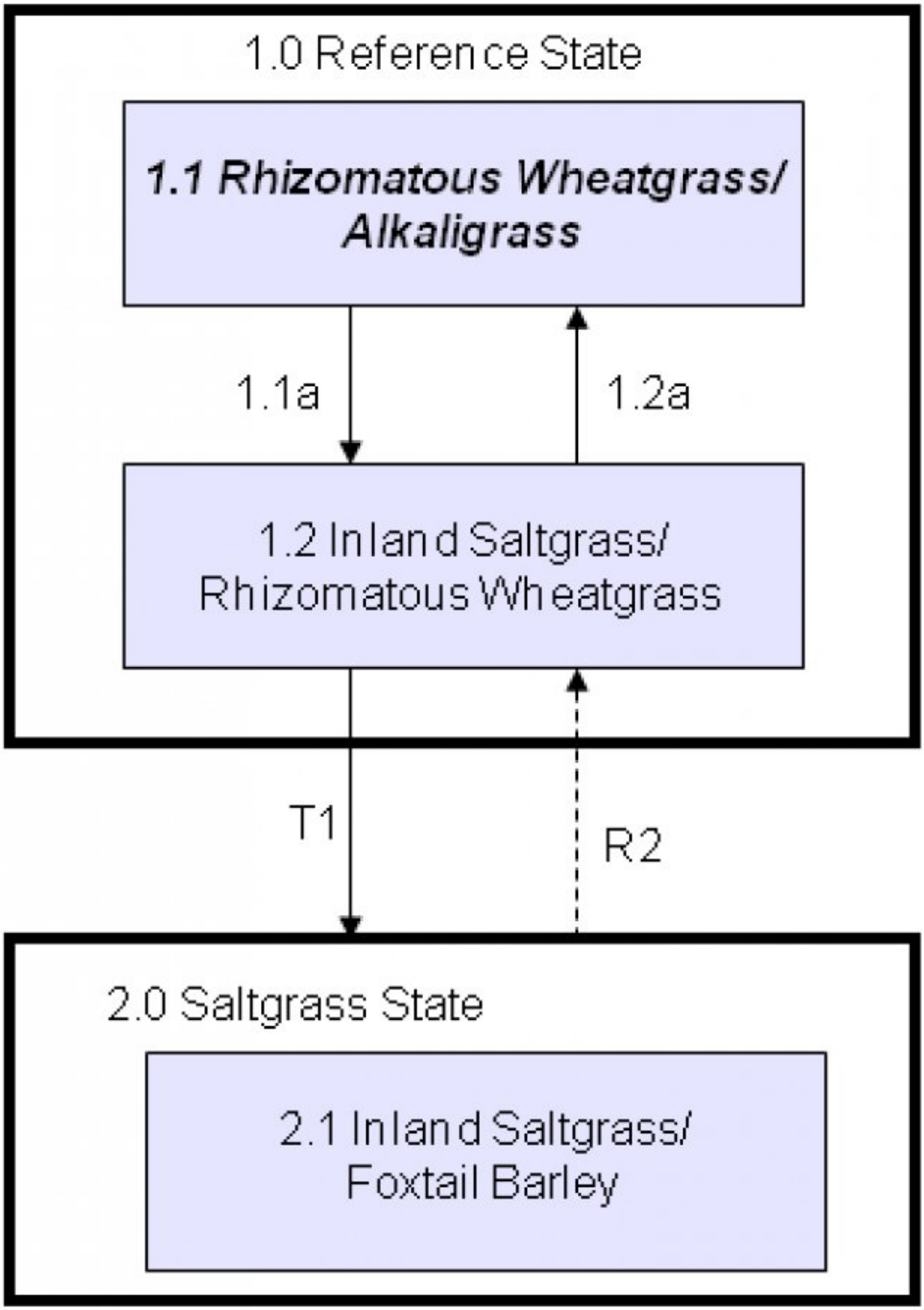
This site developed under Northern Great Plains climatic conditions, natural influences of large herbivores, occasional fire, and other biotic and abiotic factors that typically influence soil/site development. Changes will occur in the plant communities due to short-term weather variations, impacts 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.

The plant community upon which interpretations are primarily based is the Rhizomatous Wheatgrass/Alkaligrass 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.

As this site deteriorates, species such as inland saltgrass and foxtail barley increase, and annual species may invade the site. Grasses such as alkali sacaton, rhizomatous wheatgrasses, and Nuttall's alkaligrass will decrease in frequency and production. The high salt content of the soils greatly influences the plant species present. Plant vigor can vary on a year-to-year basis in relation to current precipitation amounts, which influences the translocation of salts in the soil profile. Typically, only salt tolerant plants are found on this site.

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 are discussed in more detail in the plant community descriptions following the diagram.

State and transition model



State 1
Reference

The State narrative is under development.

Community 1.1
Rhizomatous Wheatgrass/Nuttall's Alkaligrass

The interpretive plant community for this site is the Rhizomatous Wheatgrass/Alkaligrass Plant Community. This is also considered to be climax. Potential vegetation is about 80 to 90 percent grasses or grass-like plants, 1 to 5 percent forbs, and 5 to 15 percent shrubs. Saline tolerant grasses dominate the plant community. Major grasses include rhizomatous wheatgrasses, alkali sacaton, Nuttall’s alkaligrass, and alkali and/or prairie cordgrass. Other grasses or grass-like species occurring on the site include inland saltgrass, thickspike wheatgrass, plains bluegrass, foxtail barley, and sedges. Significant forbs include povertyweed, alkali plantain, and seepweed. The significant shrubs that occur include black greasewood, fourwing saltbush, Gardner’s saltbush, and rubber rabbitbrush. 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 at the sites potential. Plant litter is properly distributed with some movement offsite and natural plant mortality is low. The diversity in plant species allows for high drought tolerance.

Table 5. Annual production by plant type

Plant Type	Low (Kg/Hectare)	Representative Value (Kg/Hectare)	High (Kg/Hectare)
Grass/Grasslike	1423	2438	3267
Shrub/Vine	123	280	499
Forb	22	84	157
Total	**1568**	**2802**	**3923**

Figure 5. Plant community growth curve (percent production by month). SD5807, Northern Rolling High Plains, cool-season dominant, warm-season subdominant. Cool-season dominant, Warm-season subdominant, Lowland.

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0	0	5	13	20	25	18	11	5	3	0	0

Community 1.2
Inland Saltgrass/Rhizomatous Wheatgrass

This plant community occurs as a result of moderate, continuous season-long grazing. Grasses comprise about 80 to 90 percent, forbs 5 to 10 percent, and shrubs 5 to 10 percent. Dominant grasses include inland saltgrass, western wheatgrass, foxtail barley, and thickspike wheatgrass. Other grasses and grass-like plants include Nuttall’s alkaligrass, alkali sacaton, alkali and/or prairie cordgrass, and sedge. Forbs include povertyweed, alkali plantain, seepweed and saltwort, while nonnative forbs such as cocklebur may invade. When compared to the Rhizomatous Wheatgrass/Alkaligrass Plant Community, saltgrass has increased, while Nuttall’s alkaligrass, alkali sacaton, and alkaligrass and/or prairie cordgrass have been greatly diminished.

Table 6. Annual production by plant type

Plant Type	Low (Kg/Hectare)	Representative Value (Kg/Hectare)	High (Kg/Hectare)
Grass/Grasslike	1065	1524	2062
Shrub/Vine	84	135	202
Forb	84	135	202
Total	**1233**	**1794**	**2466**

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

Moderate, continuous season-long grazing will convert this plant community to the Inland Saltgrass/Rhizomatous Wheatgrass Plant Community.

Pathway 1.2a
Community 1.2 to 1.1

Prescribed grazing will convert this plant community to the Rhizomatous Wheatgrass/Alkaligrass Plant Community.

Conservation practices

Prescribed Grazing

State 2
Saltgrass

The State narrative is under development.

Community 2.1
Inland Saltgrass/Foxtail Barley

This plant community is the result of heavy continuous grazing over a long period of time. Inland saltgrass and foxtail barley dominate this plant community. Other grasses and grass-likes that occur include mat muhly, alkali muhly, western wheatgrass, and sedges. Forbs common in this plant community are seepweed, red saltwort, and povertyweed. Bare ground has increased and production has decreased. The soils of this plant community are not well protected. The biotic integrity is compromised by introduced species, loss of the dominant climax species, and bare ground. Excessive runoff may occur.

Table 7. Annual production by plant type

Plant Type	Low (Kg/Hectare)	Representative Value (Kg/Hectare)	High (Kg/Hectare)
Grass/Grasslike	729	1079	1519
Forb	56	123	207
Shrub/Vine	–	31	67
Total	**785**	**1233**	**1793**

Figure 9. Plant community growth curve (percent production by month). SD5809, Northern Rolling High Plains, warm-season dominant, cool-season subdominant. Warm-season dominant, cool-season subdominant, lowland..

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0	0	3	10	16	22	23	14	7	5	0	0

Transition T1
State 1 to 2

Heavy continuous grazing will convert this plant community to the Inland Saltgrass/Foxtail Barley Plant Community.

Restoration pathway R2

State 2 to 1

Long-term prescribed grazing may eventually lead this plant community to the Inland Saltgrass/Rhizomatous Wheatgrass Plant Community.

Conservation practices

Prescribed Grazing

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	**Wheatgrasses**			560–1121	
	western wheatgrass	PASM	*Pascopyrum smithii*	420–981	–
	thickspike wheatgrass	ELLAL	*Elymus lanceolatus ssp. lanceolatus*	140–420	–
	Montana wheatgrass	ELAL7	*Elymus albicans*	0–280	–
	slender wheatgrass	ELTR7	*Elymus trachycaulus*	0–140	–
2	**Cool-Season Bunch Grasses**			280–701	
	Nuttall's alkaligrass	PUNU2	*Puccinellia nuttalliana*	280–560	–
	foxtail barley	HOJU	*Hordeum jubatum*	28–140	–
	plains bluegrass	POAR3	*Poa arida*	0–140	–
	Grass, perennial	2GP	*Grass, perennial*	0–140	–
	squirreltail	ELEL5	*Elymus elymoides*	0–84	–
3	**Warm-Season Grasses**			140–560	
	alkali sacaton	SPAI	*Sporobolus airoides*	140–420	–
	alkali cordgrass	SPGR	*Spartina gracilis*	0–420	–
	prairie cordgrass	SPPE	*Spartina pectinata*	0–420	–
	Grass, perennial	2GP	*Grass, perennial*	0–140	–
4	**Short-Warm Season Grasses**			140–280	
	saltgrass	DISP	*Distichlis spicata*	140–280	–
	scratchgrass	MUAS	*Muhlenbergia asperifolia*	0–84	–
	mat muhly	MURI	*Muhlenbergia richardsonis*	0–84	–
5	**Grass-Likes**			0–84	
	Grass-like (not a true grass)	2GL	*Grass-like (not a true grass)*	0–84	–
	sedge	CAREX	*Carex*	0–84	–
	rush	JUNCU	*Juncus*	0–84	–
Forb					
7	**Forbs**			28–140	
	Forb, native	2FN	*Forb, native*	0–140	–
	povertyweed	IVAX	*Iva axillaris*	28–84	–
	redwool plantain	PLER	*Plantago eriopoda*	0–56	–
	seepweed	SUAED	*Suaeda*	0–56	–
	western dock	RUAQ	*Rumex aquaticus*	0–56	–

	red swampfire	SARU	*Salicornia rubra*	0–28	–
	cinquefoil	POTEN	*Potentilla*	0–28	–
	saltbush	ATRIP	*Atriplex*	0–28	–
	bighead pygmycudweed	EVPR	*Evax prolifera*	0–28	–
Shrub/Vine					
8	**Shrubs**			140–420	
	greasewood	SAVE4	*Sarcobatus vermiculatus*	0–224	–
	Shrub (>.5m)	2SHRUB	*Shrub (>.5m)*	0–140	–
	fourwing saltbush	ATCA2	*Atriplex canescens*	28–140	–
	Gardner's saltbush	ATGA	*Atriplex gardneri*	28–140	–
	rubber rabbitbrush	ERNA10	*Ericameria nauseosa*	0–140	–

Table 9. Community 1.2 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production (Kg/Hectare)	Foliar Cover (%)
Grass/Grasslike					
1	**Wheatgrasses**			269–448	
	western wheatgrass	PASM	*Pascopyrum smithii*	179–359	–
	thickspike wheatgrass	ELLAL	*Elymus lanceolatus ssp. lanceolatus*	18–179	–
	Montana wheatgrass	ELAL7	*Elymus albicans*	0–72	–
	slender wheatgrass	ELTR7	*Elymus trachycaulus*	0–36	–
2	**Cool-Season Bunch Grasses**			179–448	
	foxtail barley	HOJU	*Hordeum jubatum*	90–269	–
	Nuttall's alkaligrass	PUNU2	*Puccinellia nuttalliana*	0–126	–
	Grass, perennial	2GP	*Grass, perennial*	0–90	–
	squirreltail	ELEL5	*Elymus elymoides*	0–36	–
	plains bluegrass	POAR3	*Poa arida*	0–36	–
3	**Warm-Season Grasses**			0–90	
	alkali sacaton	SPAI	*Sporobolus airoides*	0–90	–
	alkali cordgrass	SPGR	*Spartina gracilis*	0–90	–
	prairie cordgrass	SPPE	*Spartina pectinata*	0–90	–
	Grass, perennial	2GP	*Grass, perennial*	0–36	–
4	**Short-Warm Season Grasses**			179–448	
	saltgrass	DISP	*Distichlis spicata*	179–359	–
	scratchgrass	MUAS	*Muhlenbergia asperifolia*	0–90	–
	mat muhly	MURI	*Muhlenbergia richardsonis*	0–90	–
5	**Grass-Likes**			0–90	
	Grass-like (not a true grass)	2GL	*Grass-like (not a true grass)*	0–90	–
	sedge	CAREX	*Carex*	0–90	–
	rush	JUNCU	*Juncus*	0–90	–
6	**Non-Native Grasses**			0–90	
	cheatgrass	BRTE	*Bromus tectorum*	0–90	–
	bluegrass	POA	*Poa*	0–90	–

Forb					
7	**Forbs**			90–179	
	Forb, introduced	2FI	*Forb, introduced*	0–90	–
	Forb, native	2FN	*Forb, native*	0–90	–
	seepweed	SUAED	*Suaeda*	0–54	–
	povertyweed	IVAX	*Iva axillaris*	18–54	–
	redwool plantain	PLER	*Plantago eriopoda*	0–54	–
	red swampfire	SARU	*Salicornia rubra*	0–36	–
	saltbush	ATRIP	*Atriplex*	0–18	–
	bighead pygmycudweed	EVPR	*Evax prolifera*	0–18	–
Shrub/Vine					
8	**Shrubs**			90–179	
	rubber rabbitbrush	ERNA10	*Ericameria nauseosa*	0–126	–
	Shrub (>.5m)	2SHRUB	*Shrub (>.5m)*	0–54	–
	fourwing saltbush	ATCA2	*Atriplex canescens*	0–36	–
	Gardner's saltbush	ATGA	*Atriplex gardneri*	0–36	–
	greasewood	SAVE4	*Sarcobatus vermiculatus*	0–36	–

Table 10. Community 2.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production (Kg/Hectare)	Foliar Cover (%)
Grass/Grasslike					
1	**Wheatgrasses**			0–62	
	western wheatgrass	PASM	*Pascopyrum smithii*	0–62	–
	thickspike wheatgrass	ELLAL	*Elymus lanceolatus ssp. lanceolatus*	0–37	–
2	**Cool-Season Bunch Grasses**			185–370	
	foxtail barley	HOJU	*Hordeum jubatum*	185–370	–
	Grass, perennial	2GP	*Grass, perennial*	0–62	–
4	**Short-Warm Season Grasses**			308–616	
	saltgrass	DISP	*Distichlis spicata*	308–555	–
	scratchgrass	MUAS	*Muhlenbergia asperifolia*	0–62	–
	mat muhly	MURI	*Muhlenbergia richardsonis*	0–62	–
5	**Grass-Likes**			0–62	
	Grass-like (not a true grass)	2GL	*Grass-like (not a true grass)*	0–62	–
	sedge	CAREX	*Carex*	0–62	–
	rush	JUNCU	*Juncus*	0–62	–
6	**Non-Native Grasses**			0–37	
	cheatgrass	BRTE	*Bromus tectorum*	0–37	–
	bluegrass	POA	*Poa*	0–37	–
Forb					
7	**Forbs**			62–185	
	Forb, introduced	2FI	*Forb, introduced*	37–148	–
	Forb, native	2FN	*Forb, native*	0–62	–
	seepweed	SUAED	*Suaeda*	0–49	–
	povertyweed	IVAX	*Iva axillaris*	12–37	–
	redwool plantain	PLER	*Plantago eriopoda*	0–37	–
	red swampfire	SARU	*Salicornia rubra*	0–25	–
	saltbush	ATRIP	*Atriplex*	0–12	–
	bighead pygmycudweed	EVPR	*Evax prolifera*	0–12	–
Shrub/Vine					
8	**Shrubs**			0–62	
	rubber rabbitbrush	ERNA10	*Ericameria nauseosa*	0–62	–
	Shrub (>.5m)	2SHRUB	*Shrub (>.5m)*	0–25	–

Animal community

Animal Community – Wildlife Interpretations
The 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 loss of 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 Saline Lowland Ecological Site (ES) provides upland/wetland complex cover with an associated shrub/forb component. It is 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 Saline Lowland ES has remained relatively intact. This site may have sufficient hydrology to support hydrophytic vegetation and wildlife species associated with saturated saline soil conditions. Due to high salinity concentrations, both plant and wildlife species diversity is limited.

Rhizomatous Wheatgrass/Alkaligrass, Inland Saltgrass/Rhizomatous Wheatgrass, and Inland Saltgrass/Foxtail Barley: The predominance of saline tolerant hydrophytic vegetation, including shrubs, does not favor any particular wildlife group. However, the site may receive limited shorebird use. This plant community provides habitat for limited invertebrate populations. Herptile use is either extremely limited or nonexistent. 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.

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 group B or 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; Chuck Berdan, Biologist (BIO), Bureau of Land Management (BLM); Stan Boltz, RMS, NRCS; Dave Dewald, Wildlife BIO, NRCS; Jody Forman, RMS, NRCS; Dennis Froemke, RMS, NRCS; Tom Juntti, BIO, United States Forest Service (USFS); Cheryl Nielsen, RMS, NRCS; Jeff Printz, RMS, NRCS; Mike Stirling, RMS, NRCS; Dan Svingen, BIO, USFS; Darrell Vanderbusch, Soil Scientist, NRCS; Cindy Zachmeier, BIO, NRCS; and Tim Zachmeier, BIO, BLM.

There are 3 SCS-RANGE-417's collected between 1981 and 1982 from Harding County, South Dakota.

Other references

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Contributors

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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.

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):** 0 to 10 percent is typical.

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 greater than 3. Surface organic matter adheres to the soil surface. Soil surface fragments will typically retain structure at least for short periods when dipped in distilled water. Some fragments will dissolve in less than 1 minute.

9. **Soil surface structure and SOM content (include type of structure and A-horizon color and thickness):** A-horizon should be 3 to 19 inches thick with dark grayish brown colors when moist. Structure typically is coarse sub-angular blocky in the 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-likes) 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 – when dry, B horizons can be hard and appear to be compacted, but no platy structure will be present.

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 >> Cool-season bunchgrasses >

    Sub-dominant: Tall warm-season rhizomatous grasses > Shrubs >

    Other: Short warm-season grasses > Forbs > Grass-likes

Additional:

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.

14. **Average percent litter cover (%) and depth (in):**

15. **Expected annual annual-production (this is TOTAL above-ground annual-production, not just forage annual-production):** Production ranges from 1,400-3,500 lbs./acre (air-dry weight). Reference value production is 2,500 lbs./acre (air-dry weight).

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; Russian olive can dominate this site in localized areas

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.