USDA Natural Resources Conservation Service

Ecological site R058DY002SD
Wet Land

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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.

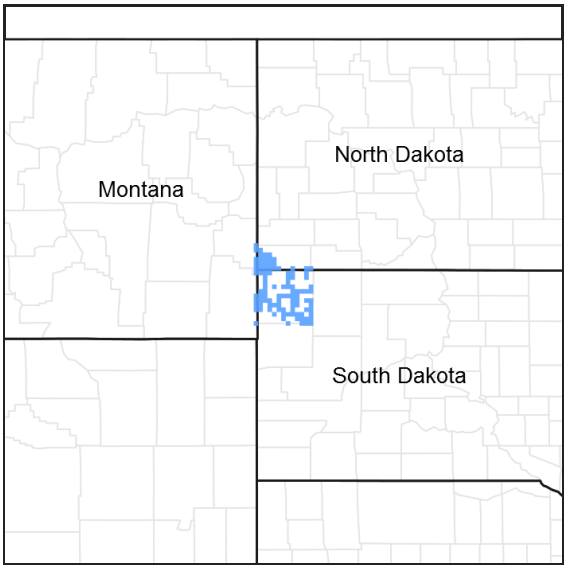

Figure 1. Mapped extent

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.

MLRA notes

Major Land Resource Area (MLRA): 058D–Northern Rolling High Plains, Eastern Part

The Northern Rolling High Plains, Eastern Part (MLRA 58D) is shared between South Dakota (65 percent), Montana (21 percent), and North Dakota (14 percent). The MLRA is approximately 2,755 square miles. The small towns of Buffalo and Camp Crook, South Dakota, and Marmarth, North Dakota, are all within the boundary of this MLRA, and Baker, Montana, is on the northern most edge. Portions of the Little Missouri National Grassland and Custer National Forest are also in the MLRA. Portions of the Little Missouri River and the headwaters of major tributaries that eventually form the Grand and Moreau Rivers in South Dakota are also in this area.

The Northern Rolling High Plains, Eastern Part consists of Cretaceous marine and continental sediments of shale, siltstone, and sandstone. The continental and marine Hell Creek Formation is under approximately 85 percent of the MLRA, and the Fox Hills Sandstone forms the southern boundary of the MLRA. Tertiary deposits are in scattered areas throughout the MLRA. These deposits consist of the Paleocene Ludlow and Tongue River Formations, the Oligocene White River Group, and the Miocene Arikaree Group. These Tertiary deposits are resistant and positioned above the Cretaceous beds. Ponderosa pine growing in areas of these Tertiary formations further distinguishes these formations from the other formations in the MLRA. Pleistocene and Holocene river sand and gravel deposits are also on the valley floors and on the terraces along the larger rivers in the area. A large Quaternary eolian deposit is directly south of the town of Buffalo.

The average elevation of MLRA 58D ranges from 2,300 feet to 4,000 feet, increasing gradually from east to west. Harding Peak is the highest point at 4,019 feet. In places, flat-topped, steep-sided buttes rise sharply above the gently rolling plains below.

The dominant soil orders in this MLRA are Alfisols, Entisols, Inceptisols, and Mollisols. The soils in the area dominantly have a frigid soil temperature regime, an ustic soil moisture regime that borders on aridic, and mixed mineralogy. They are shallow to very deep, generally well drained, and loamy or clayey.

Annual precipitation is 14 to 17 inches and can fluctuate widely from year to year. Most rainfall occurs early in the growing season. Some high-intensity thunderstorms occur mid to late summer. The native vegetation in this MLRA consists primarily of grasses and forbs with a small component of trees and shrubs along streams. Ponderosa pine grow on the upper slopes and on the top of some of the higher buttes. Open grasslands are characterized by western wheatgrass, green needlegrass, blue grama, and buffalograss. Wyoming big sagebrush grows on clayey soils in the western part of the MLRA.

More than four-fifths of the MLRA is privately owned ranches running cattle, sheep, or both. Less than 5 percent of the area is federally owned. The major resource concerns are water quality, wind erosion, and water erosion (USDA, NRCS. 2006. Ag Handbook 296).

Classification relationships

USDA
Land Resource Region G—Western Great Plains Range and Irrigated Region:
Major Land Resource Area (MLRA) 58D—Northern Rolling High Plains, Eastern Part.

US Environmental Protection Agency (EPA)
Level IV Ecoregions of the Conterminous United States:
Northwestern Great Plains—43:
Forested Buttes—43d.
Sagebrush Steppe—43e.

USDA Forest Service
Ecological Subregions: Sections and Subsections of Conterminous United States:
Great Plains - Palouse Dry Steppe Province—331:
Missouri Plateau Section—331M.
Sagebrush Steppe Subsection—334Mi.

Ecological site concept

The Wet Land ecological site is found throughout MLRA 58D. It’s a run-in site on drainageways, oxbows, and flood plains. Slopes range from 0 to 3 percent. The soils are very deep, very poorly to poorly drained, and formed in clayey or silty alluvium. The surface layer is 5 to 6 inches in depth with silty clay to silty clay loam textures. A permanent water table will fluctuate between the surface and a depth of 18 inches.

Vegetation in Reference State (1.0) consists of grass, sedge, and rush species that are classified as wetland obligate or facultative wet.

Associated sites

R058DY007SD	**Saline Lowland** The Saline Lowland ecological site is on low terraces above the Wet Land ecological site. The plant communities in the Saline Lowland will be more sodium tolerant.
R058DY004SD	**Wet Meadow** The Wet Meadow ecological site is found adjacent to or intermixed with the Wet Land ecological site. The Wet Land ecological site will have a permanent water table within 18 inches of the soil surface, the Wet Meadow will have a permanent water table within 72 inches of the soil surface.

Similar sites

R058DY004SD	**Wet Meadow** The Wet Meadow ecological site will have more prairie cordgrass; and more upland grasses than the Wet Land ecological site.

Table 1. Dominant plant species

Tree	Not specified
Shrub	Not specified
Herbaceous	(1) *Spartina pectinata* (2) *Calamagrostis canadensis*

Physiographic features

The Wet Land ecological site is found in level or nearly level river valleys, near springs, seeps, and sloughs. A permanent water table generally occurs at or within 18 inches of the surface.

Table 2. Representative physiographic features

Landforms	(1) Drainageway (2) Oxbow (3) Slough
Runoff class	Negligible to medium
Flooding duration	Long (7 to 30 days)
Flooding frequency	Occasional to frequent
Ponding duration	Brief (2 to 7 days) to very long (more than 30 days)
Ponding frequency	Frequent
Elevation	2,300–4,000 ft
Slope	0–3%
Ponding depth	0–12 in
Water table depth	0–18 in
Aspect	Aspect is not a significant factor

Climatic features

The climate in MLRA 58D is typical of the drier portions of the Northern Great Plains where sagebrush steppes to the west yield to grassland to the east. Average annual precipitation ranges from 14 to 17 inches with most falling in the early 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. This wide range is due to the high elevation and dry air, which permit 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 have the most severe effect on ranching operations during late winter and in 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) to about 20 °F (Baker, Montana). July is the warmest month with temperatures averaging from about 70 °F (Marmarth, North Dakota) to about 76 °F (Baker, Montana). The range of normal average monthly temperatures between the coldest and warmest months is about 55 °F. Wind speeds 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 winds. Strong storms may bring brief periods of high winds with gusts of 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 continue to early or mid-September. Cool-season plants may green-up in September and October if adequate soil moisture is present.

Table 3. Representative climatic features

Frost-free period (characteristic range)	97-111 days
Freeze-free period (characteristic range)	121-129 days
Precipitation total (characteristic range)	15-17 in
Frost-free period (actual range)	93-115 days
Freeze-free period (actual range)	120-132 days
Precipitation total (actual range)	14-17 in
Frost-free period (average)	104 days
Freeze-free period (average)	125 days
Precipitation total (average)	16 in

Climate stations used

- (1) BAKER 1 E [USC00240412], Baker, MT
- (2) LADNER 9SW [USC00394671], Camp Crook, SD
- (3) CAMP CROOK [USC00391294], Camp Crook, SD
- (4) BUFFALO ASOS [USW00094037], Buffalo, SD
- (5) BUFFALO 13 ESE [USW00094081], Reva, SD
- (6) REDIG 11 NE [USC00397062], Buffalo, SD
- (7) HOOVER [USC00393945], Newell, SD

Influencing water features

The Wet Land ecological site has a combination of physical and hydrological features that: (1) provides season-long ground water within 18 inches of the surface, (2) allows relatively free movement of water and air in the upper part of the soil, and (3) results in occasional or frequent flooding.

Wetland description

System: Palustrine
Subsystem: N/A
Class: Emergent Wetland
Subclass: Persistent
(Cowardin et al., 1979)

Soil features

Soils common o the Wet Land ecological site have a silty clay to silty clay loam surface layer that is 5 to 6 inches thick. Slopes range from 0 to 3 percent. Soils are deep (greater than 20 inches) and formed in alluvium weathered from siltstone and mudstone. The texture of the subsurface layer’s ranges from silty clay loam to silty clay. Subsurface layers are nonrestrictive to water movement and root penetration. The soils in this site are poorly or very poorly drained and have a moderate to very slow infiltration rate.

Rills and gullies are not typically present. Water flow patterns are barely distinguishable if present. Litter typically falls in place, and signs of movement are not common. Chemical and physical crusts are rare to nonexistent.

The major Soil correlated to the Wet Land ecological site is Lallie.

Lallie is also correlated to the Wet Meadow ecological site when the site is ponded for 4 to 8 weeks.

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 area of interest, or use the internet to access USDA's Web Soil Survey.

Table 4. Representative soil features

Parent material	(1) Alluvium–siltstone (2) Alluvium–mudstone
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	80 in
Surface fragment cover <=3"	0%
Surface fragment cover >3"	0%
Available water capacity (0-40in)	6–7 in
Calcium carbonate equivalent (0-40in)	0–30%
Electrical conductivity (0-40in)	0–8 mmhos/cm
Sodium adsorption ratio (0-40in)	0–13
Soil reaction (1:1 water) (0-40in)	6.1–9
Subsurface fragment volume <=3" (Depth not specified)	0%
Subsurface fragment volume >3" (Depth not specified)	0%

Ecological dynamics

The Wet Land ecological site developed under the Northern Great Plains climatic conditions; light to severe grazing by bison and other large herbivores; sporadic, natural or human-caused wildfire (often of light intensities); and other biotic and abiotic factors that typically influence soil and site development. Changes occur in the plant communities due to short-term weather variations, effects of native and exotic plant and animal species, and management actions. While the following plant community descriptions are typical of the transitions between communities, severe disturbances, such as periods of well below average precipitation and the introduction of non-native cool-season grasses, can cause significant shifts in plant communities and 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 mountain rush (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 (1.2), 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 Prairie Cordgrass-Reedgrass/Sedge Plant Community (1.1). 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.

The following state-and-transition diagram illustrates the common plant communities 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

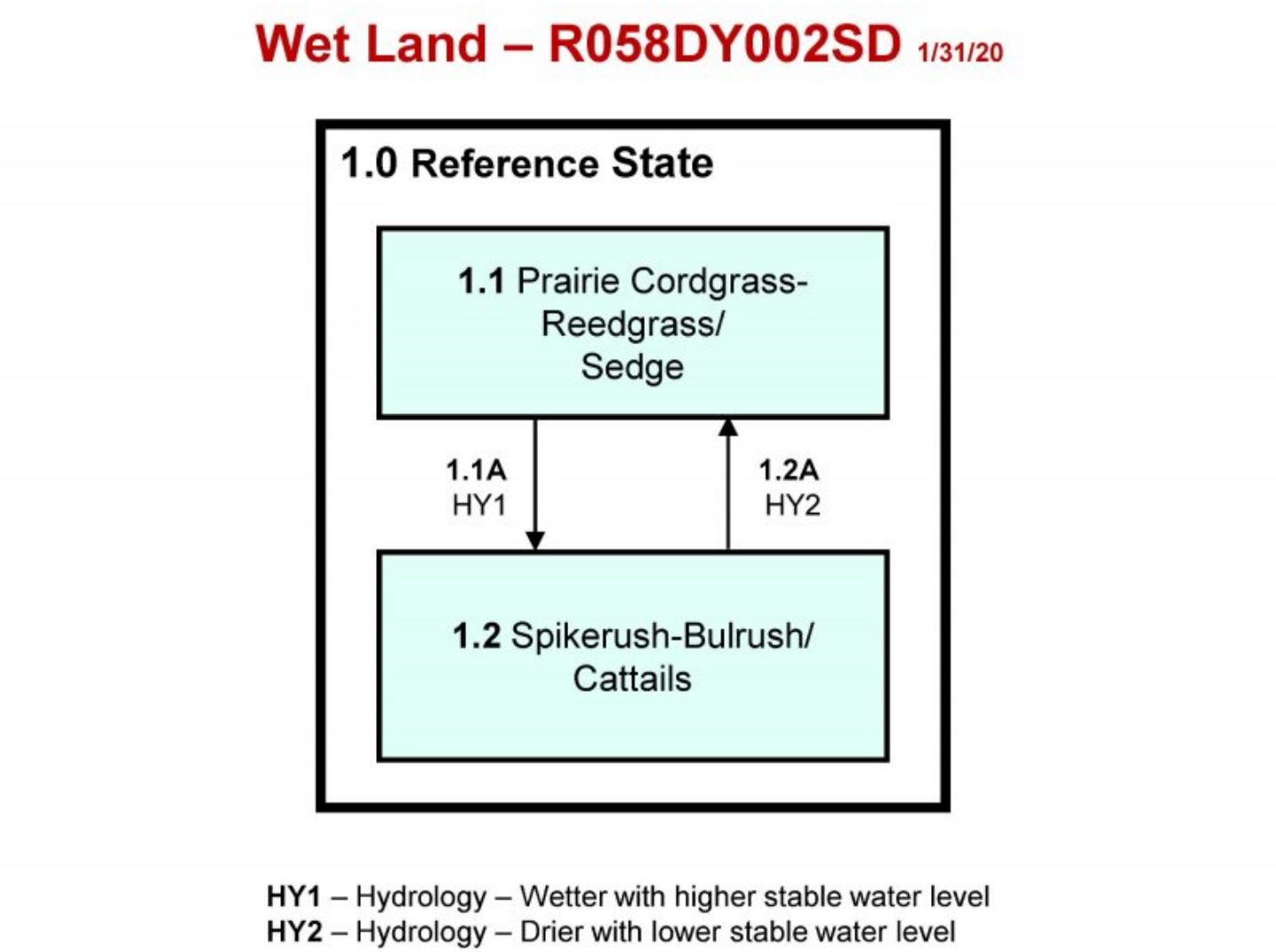

Diagram Legend: Wet Land - R058DY002SD

1.1A	1.1 to 1.2	Change to a wetter hydrologic cycle with a higher stable water level.
1.2A	1.2 to 1.1	Return to a normal or slightly drier hydrologic cycle with lower stable water level.

State 1
Reference State

The Reference State (1.0) represents what is believed to show the natural range of variability that dominated the dynamics of this ecological site prior to European settlement. This site, in the Reference State (1.0), is dominated by grasses, grass-like species, forbs, and shrubs. Variations in annual precipitation and in length of time the site is ponded greatly influence the species composition from year to year. During wet years, the plant community responds to higher surface water levels. Grass-like species and forbs increase in abundance. During drier years,

the plant community is dominated by grasses and obligate sedges and rushes. Grazing pressure on this site and surrounding sites also influence the plant community dynamics. Hoof action during wet periods can cause soil compaction and reduce rooting depth and soil saturation levels. Heavy animal concentrations or cropping on the surrounding landscapes can increase runoff and sedimentation. In pre-European settlement times, the primary disturbances included grazing by large ungulates, occasional fire, and drought. Favorable growing conditions occurred during the spring and the warm months of June through August. Today, a similar state can be found in areas where proper livestock management occurs.

Dominant plant species

- prairie cordgrass (*Spartina pectinata*), grass
- reedgrass (*Calamagrostis*), grass
- common spikerush (*Eleocharis palustris*), grass
- bulrush (*Schoenoplectus*), grass
- sedge (*Carex*), grass
- cattail (*Typha*), grass

Community 1.1
Prairie Cordgrass-Reedgrass/Sedges

Interpretations are based primarily on the Prairie Cordgrass-Reedgrass/Sedge Plant Community. This is also considered to be the Reference Plant Community (1.1). Potential vegetation is about 50 to 75 percent grasses, 20 to 35 percent sedges and rushes, 5 to 10 percent forbs, and 0 to 5 percent shrubs and trees. The major grasses and grass-like species include prairie cordgrass, Nebraska sedge, bluejoint reedgrass, and northern reedgrass. Grasses and grass-like species of lesser importance are mountain rush (Baltic rush) and low-growing, unpalatable sedges. 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. This is a sustainable plant community in terms of 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	4280	4895	5485
Forb	220	412	600
Shrub/Vine	0	138	300
Tree	0	55	115
Total	**4500**	**5500**	**6500**

Figure 9. 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 develops during a wetter cycle of precipitation and hydrology. This plant community is approximately 10 to 30 percent grasses, 40 to 60 percent grass-like species, 15 to 35 percent forbs, and 0 to 5 percent shrubs and trees. The plant community becomes dominated by grass-like species such as Nebraska sedge, various obligate and facultative wet sedges, spikerush, and mountain rush (Baltic rush). Forbs include Pennsylvania smartweed, swamp smartweed, and cattail. When compared to the Prairie Cordgrass-Reedgrass/Sedge Plant Community (1.1), the abundance of prairie cordgrass, northern reedgrass, bluejoint reedgrass, and Nebraska sedge is decreased in Plant Community 1.2. Low growing unpalatable sedges, mountin rush (Baltic rush), and cattails have increased in abundance. The abundant production and proximity to water make

Plant Community 1.2 important for livestock and wildlife such as birds, mule deer, and antelope. The plant community is stable and protected from excessive erosion. The biotic integrity of this plant community is intact. The watershed is usually functioning. Although plant diversity has been reduced, the soil is still stable. The water cycle, nutrient cycle, and energy flow are slightly reduced but continue to function adequately.

Table 6. Annual production by plant type

Plant Type	Low (Lb/Acre)	Representative Value (Lb/Acre)	High (Lb/Acre)
Grass/Grasslike	2780	3105	4075
Forb	220	1238	1600
Shrub/Vine	0	112	230
Tree	0	45	95
Total	**3000**	**4500**	**6000**

Figure 11. 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

A wetter hydrology cycles will shift the Prairie Cordgrass-Reedgrass/Sedge Plant Community (1.1) to the Spikerush-Bulrush/Cattail Plant Community (1.2).

Pathway 1.2A
Community 1.2 to 1.1

A return to a normal or slightly drier cycle of precipitation and hydrology, shift Plant Community 1.2 to the Prairie Cordgrass-Reedgrass/Sedge Plant Community (1.1).

Additional community tables

Table 7. Community 1.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production (Lb/Acre)	Foliar Cover (%)
Grass/Grasslike					
1	**Tall Warm-Season Grasses**			2200–3025	
	prairie cordgrass	SPPE	*Spartina pectinata*	2200–3025	–
	rough barnyardgrass	ECMU2	*Echinochloa muricata*	275–825	–
2	**Cool-Season Grasses**			550–1650	
	bluejoint	CACA4	*Calamagrostis canadensis*	550–1375	–
	northern reedgrass	CASTI3	*Calamagrostis stricta ssp. inexpansa*	110–550	–
	slimstem reedgrass	CASTS5	*Calamagrostis stricta ssp. stricta*	110–550	–
3	**Other Native Grasses**			275–550	
	foxtail barley	HOJU	*Hordeum jubatum*	0–275	–
	reed canarygrass	PHAR3	*Phalaris arundinacea*	0–275	–
	slender wheatgrass	ELTR7	*Elymus trachycaulus*	0–275	–
	switchgrass	PAVI2	*Panicum virgatum*	0–275	–

	Grass, perennial	2GP	*Grass, perennial*	0–275	–
	western wheatgrass	PASM	*Pascopyrum smithii*	0–165	–
	fowl mannagrass	GLST	*Glyceria striata*	0–110	–
	saltgrass	DISP	*Distichlis spicata*	0–55	–
4	**Grass-Likes**			1100–1925	
	wheat sedge	CAAT2	*Carex atherodes*	275–825	–
	Nebraska sedge	CANE2	*Carex nebrascensis*	275–825	–
	sedge	CAREX	*Carex*	275–550	–
	bulrush	SCHOE6	*Schoenoplectus*	275–550	–
	spikerush	ELEOC	*Eleocharis*	275–550	–
	Grass-like (not a true grass)	2GL	*Grass-like (not a true grass)*	0–275	–
	rush	JUNCU	*Juncus*	0–275	–
5	**Non-Native Cool-Season Grasses**			0	
Forb					
6	**Forbs**			275–550	
	dock	RUMEX	*Rumex*	0–275	–
	Forb, native	2FN	*Forb, native*	55–275	–
	wild mint	MEAR4	*Mentha arvensis*	0–165	–
	stinging nettle	URDI	*Urtica dioica*	0–165	–
	swamp milkweed	ASIN	*Asclepias incarnata*	0–110	–
	swamp smartweed	POHY2	*Polygonum hydropiperoides*	0–110	–
	white water crowfoot	RAAQ	*Ranunculus aquatilis*	0–110	–
	smooth horsetail	EQLA	*Equisetum laevigatum*	0–110	–
	pale dock	RUAL4	*Rumex altissimus*	0–110	–
	Pennsylvania smartweed	POPE2	*Polygonum pensylvanicum*	0–110	–
	spotted water hemlock	CIMA2	*Cicuta maculata*	0–110	–
	American licorice	GLLE3	*Glycyrrhiza lepidota*	0–110	–
	aster	ASTER	*Aster*	0–110	–
	broadleaf cattail	TYLA	*Typha latifolia*	0–110	–
	cinquefoil	POTEN	*Potentilla*	0–110	–
Shrub/Vine					
7	**Shrubs**			0–275	
	willow	SALIX	*Salix*	0–220	–
	Shrub (>.5m)	2SHRUB	*Shrub (>.5m)*	0–165	–
	false indigo bush	AMFR	*Amorpha fruticosa*	0–110	–
Tree					
8	**Trees**			0–110	
	cottonwood	POPUL	*Populus*	0–110	–
	Tree	2TREE	*Tree*	0–55	–

Table 8. Community 1.2 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production (Lb/Acre)	Foliar Cover (%)
Grass/Grasslike					

1	**Tall Warm-Season Grasses**			225–900	
	prairie cordgrass	SPPE	*Spartina pectinata*	225–675	–
	rough barnyardgrass	ECMU2	*Echinochloa muricata*	0–225	–
2	**Cool-Season Grasses**			45–450	
	bluejoint	CACA4	*Calamagrostis canadensis*	0–450	–
	northern reedgrass	CASTI3	*Calamagrostis stricta ssp. inexpansa*	0–225	–
	slimstem reedgrass	CASTS5	*Calamagrostis stricta ssp. stricta*	0–225	–
3	**Other Native Grasses**			225–675	
	foxtail barley	HOJU	*Hordeum jubatum*	0–225	–
	reed canarygrass	PHAR3	*Phalaris arundinacea*	0–225	–
	slender wheatgrass	ELTR7	*Elymus trachycaulus*	0–225	–
	Grass, perennial	2GP	*Grass, perennial*	0–225	–
	switchgrass	PAVI2	*Panicum virgatum*	0–45	–
	western wheatgrass	PASM	*Pascopyrum smithii*	0–45	–
	saltgrass	DISP	*Distichlis spicata*	0–45	–
	fowl mannagrass	GLST	*Glyceria striata*	0–45	–
4	**Grass-Likes**			1800–2700	
	spikerush	ELEOC	*Eleocharis*	450–1125	–
	bulrush	SCHOE6	*Schoenoplectus*	450–900	–
	Nebraska sedge	CANE2	*Carex nebrascensis*	225–675	–
	rush	JUNCU	*Juncus*	225–675	–
	wheat sedge	CAAT2	*Carex atherodes*	225–675	–
	sedge	CAREX	*Carex*	225–450	–
	Grass-like (not a true grass)	2GL	*Grass-like (not a true grass)*	0–450	–
5	**Non-Native Cool-Season Grasses**			0	
Forb					
6	**Forbs**			675–1575	
	broadleaf cattail	TYLA	*Typha latifolia*	450–900	–
	smooth horsetail	EQLA	*Equisetum laevigatum*	90–450	–
	dock	RUMEX	*Rumex*	0–225	–
	Pennsylvania smartweed	POPE2	*Polygonum pensylvanicum*	0–225	–
	stinging nettle	URDI	*Urtica dioica*	0–225	–
	swamp smartweed	POHY2	*Polygonum hydropiperoides*	0–225	–
	Forb, native	2FN	*Forb, native*	45–225	–
	American licorice	GLLE3	*Glycyrrhiza lepidota*	0–225	–
	swamp milkweed	ASIN	*Asclepias incarnata*	0–135	–
	spotted water hemlock	CIMA2	*Cicuta maculata*	0–135	–
	pale dock	RUAL4	*Rumex altissimus*	0–135	–
	cinquefoil	POTEN	*Potentilla*	0–135	–
	wild mint	MEAR4	*Mentha arvensis*	0–135	–
	white water crowfoot	RAAQ	*Ranunculus aquatilis*	0–90	–
	aster	ASTER	*Aster*	0–90	–

Shrub/Vine					
7	**Shrubs**			0–225	
	willow	SALIX	*Salix*	0–180	–
	Shrub (>.5m)	2SHRUB	*Shrub (>.5m)*	0–135	–
	false indigo bush	AMFR	*Amorpha fruticosa*	0–90	–
Tree					
8	**Trees**			0–90	
	cottonwood	POPUL	*Populus*	0–90	–
	Tree	2TREE	*Tree*	0–45	–

Animal community

Wildlife Interpretations
MLRA 58D lies within the drier portion of the 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- and shrubland habitats interspersed with varying densities of depressional instream wetlands and woody riparian corridors. These habitats provided critical life cycle components for many 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 gray wolf, mountain lion, and grizzly bear, and smaller carnivores such as the coyote, bobcat, fox, and raptors. The 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 had been extirpated in this area as a free-ranging herbivore. The loss of the bison and reduction of prairie dog populations 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 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 ecological sites.

This site provided habitat for species requiring unfragmented grassland. Important habitat features, and components found commonly or exclusively on this site may include sharp-tailed grouse leks; upland nesting habitat for grassland birds, forbs and insects for brood habitat; and a forage source for small and large herbivores. Many grassland and shrub steppe nesting bird populations are declining. Extirpated species include free-ranging American bison, grizzly bear, gray wolf, black-footed ferret, mountain plover, Rocky Mountain locust, and swift fox.

The majority of the Wet Land ecological site 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-Reedgrass/Sedge (1.1) and Spikerush-Bulrush/Cattail (1.2):
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.

Grazing Interpretations
The following list suggests annual, initial stocking rates for average growing conditions. These estimates are conservative and should be used only as guidelines in the initial stages of conservation planning. Commonly, the current plant composition does not entirely match any particular plant community (as described in this ecological site description). Therefore, a resource inventory is necessary to document plant composition and production. More accurate estimates of carrying capacity should eventually be calculated using the following stocking rate information along with animal preference data and actual stocking records, particularly when grazers other than cattle are involved. In consultation with the land manager, a more intensive grazing management program that results in improved harvest efficiencies and increased carrying capacity may be developed.

The following suggested initial stocking rates are based on 912 lb/acre (air-dry weight) per animal-unit-month (AUM) with a 25 percent harvest efficiency of preferred and desirable forage species (refer to USDA-NRCS, National Range and Pasture Handbook). An AUM is defined as the equivalent amount of forage required by a 1,000-pound cow, with or without calf, for one month.

Plant Community: Prairie Cordgrass-Reedgrass/Sedge (1.1)
Average Production (lb/acre, air-dry): 5,500*
Stocking Rate (AUM/acre): Variable*

Plant Community: Spikerush-Bulrush/Cattails (1.2)
Average Production (lb/acre, air-dry): 4,500*
Stocking Rate (AUM/acre): Variable*

* Total annual production and stocking rates are highly variable and require onsite sampling.

Total onsite annual production may contain vegetation deemed undesirable or untargeted by the grazing animal. Therefore, AUM values may need to be reduced to reflect only preferred or desirable forage species.

Grazing by domestic livestock is one of the major income-producing industries in the area. Rangeland in this area may provide yearlong forage for livestock. During the dormant period, the forage for livestock likely has insufficient protein to meet livestock requirements. Added protein allows 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

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. Refer to the USDA-NRCS National Engineering Handbook, Part 630, for hydrologic soil groups, runoff quantities, and hydrologic curves.

Recreational uses

This site provides opportunities for hunting upland game species and waterfowl. The wide variety of plants that bloom from spring until fall have aesthetic value that appeals to visitors.

Wood products

No appreciable wood products are typically present on this site.

Other products

Harvesting the seeds of native plants can provide additional income on this site.

Other information

Revision Notes: “Previously Approved” Provisional
This provisional ecological site description (ESD) has passed quality control (QC) and quality assurance (QA) to ensure the it meets the 2014 NESH standards for a provisional ecological site description.

This ESD is an updated “Previously Approved” ESD that represented a first-generation tier of documentation that, prior to the release of the 2014 National Ecological Site Handbook (NESH), met all requirements as an “Approved” ESD as laid out in the 1997 National Range and Pasture Handbook (NRPH). The document fully described the reference state and community phase in the state-and-transition model. All other alternative states are at least described in narrative form. The “Previously Approved” ESD has been field-tested for a minimum of 5 years and is a proven functional document for conservation planning. The “Previously Approved” ESD may not contain all tabular and narrative entries as required in the current “Approved” level of documentation, but continued refinement toward an “Approved” status is expected.

Site Development and Testing Plan
Future work, as described in an official project plan, is necessary to validate the information in this provisional ecological site description. The plan will include field activities for low-, medium-, and high-intensity sampling, soil correlations, and analysis of the data. Annual field reviews should be done by soil scientists and vegetation specialists. Final field review, peer review, quality control, and quality assurance reviews are required to produce the final document.

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 description include: Ryan Beer, Range Management Specialist (RMS), NRCS; Stan Boltz, RMS, NRCS; Dave Dewald, Wildlife BIO, NRCS; Mitch Faulkner, RMS, NRCS; Jody Forman, RMS, NRCS; Dennis Froemke, RMS, NRCS; Cheryl Nielsen, RMS, NRCS; Jeff Printz, RMS, NRCS; Mike Stirling, RMS, NRCS; Darrell Vanderbusch, Soil Scientist, NRCS; and Cindy Zachmeier, BIO, NRCS.

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Approval

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Acknowledgments

All ecological sites were updated by Rick L. Peterson, ESS, Rapid City, SSO in FY20.

The ESDs were available for QC review by Mark Hayek, Emily Helms, Ryan Beer, and Mitch Faulkner.

All ecological sites were then reviewed and approved at the Provisional Level by David Kraft, Regional ESS, Salina, KS in September 2020.

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.

Author(s)/participant(s)	Stan Boltz, Mitch Iverson, Thad Berrett, Cheryl Nielsen
Contact for lead author	stanley.boltz@sd.usda.gov, 605-352-1236
Date	05/07/2010
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):** 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.

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. 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.

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.

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.
