

United States Department of Agriculture Natural Resources Conservation Service

Ecological Site Description

Site Type: Rangeland

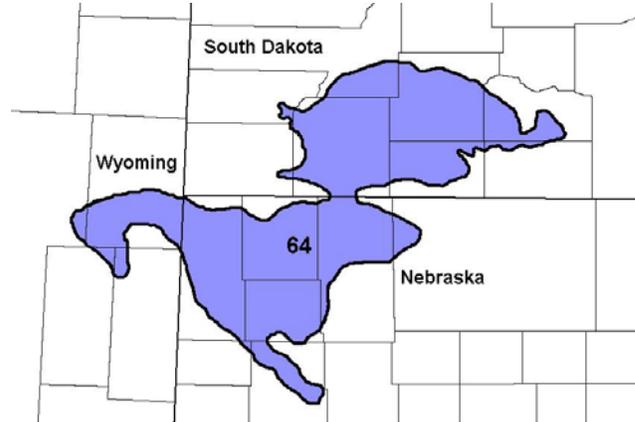
Site Name: Thin Claypan

Site ID: R064XY046NE

Major Land Resource Area (MLRA): 64 – Mixed Sandy and Silty Tableland

Physiographic Features

This site occurs on nearly level to gently undulating or rolling sedimentary uplands.



Landform: alluvial fan, alluvial flat, hill

Aspect: N/A

	<u>Minimum</u>	<u>Maximum</u>
Elevation (feet):	2,900	4,000
Slope (percent):	0	6
Water Table Depth (inches):	48	80
Flooding:		
Frequency:	None	None
Duration:	None	None
Ponding:		
Depth (inches):	None	None
Frequency:	None	None
Duration:	None	None
Runoff Class:	High	Very high

Climatic Features

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

Annual precipitation ranges from 14 to 20 inches per year. The normal average annual temperature is about 47°F. January is the coldest month with average temperatures ranging from about 21°F (Wood, South Dakota (SD)), to about 25°F (Hemingford, Nebraska (NE)). July is the warmest month with temperatures averaging from about 70°F (Keeline 3 W, Wyoming (WY)), to about 76°F (Wood, SD). The range of normal average monthly temperatures between the coldest and warmest months is about 55°F. This large annual range attests to the continental nature of this area's climate. Hourly winds average about 11 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 continue to early or mid-September. Greenup of cool-season plants may occur in September and October when adequate soil moisture is present.

	<u>Minimum</u>	<u>Maximum</u>
Frost-free period (days):	138	143
Freeze-free period (days):	161	163
Mean Annual Precipitation (inches):	14	20

Average Monthly Precipitation (inches) and Temperature (°F):

	Precip. Min.	Precip. Max	Temp. Min.	Temp. Max.
January	0.42	0.52	9.0	35.8
February	0.48	0.61	14.6	40.7
March	0.90	1.22	21.0	47.5
April	1.83	2.15	28.9	61.3
May	2.22	3.38	38.3	72.2
June	2.05	3.27	47.3	82.1
July	1.63	2.73	53.9	90.1
August	1.09	1.96	52.3	89.3
September	1.09	1.58	42.4	79.5
October	0.80	1.38	32.6	66.6
November	0.56	0.65	20.4	49.0
December	0.42	0.50	13.4	38.4

Climate Stations		Period	
Station ID	Location or Name	From	To
NE3755	Hemingford, NE	1964	1999
WY5085	Keeline 3 W, WY	1953	1986
SD9442	Wood, SD	1948	1999

For local climate stations that may be more representative, refer to <http://www.wcc.nrcs.usda.gov>.

Riparian and Wetland Features

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

Representative Soil Features

The common features of soils in this site are the very fine sandy loam to clay textured subsoils and slopes of zero to six percent. The soils in this site are moderately well to well-drained and formed in alluvium or residuum derived from soft sandstone, siltstone, or shale. The silt loam to loam surface layer is one to four inches thick. The extremely hard clayey Btn horizon has round-topped or “bun shaped” columnar or prismatic structured subsoil. These Btn horizons are high in sodium. The soils have a moderate to slow infiltration rate and very slow saturated hydraulic conductivity. Wet surface compaction can occur with heavy traffic. This site should show slight to 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.

These soils are mainly susceptible to water erosion. The hazard of water erosion increases on slopes greater than about four percent. Loss of 30 percent or more of the surface layer of the soils on this site can result in a shift in species composition and/or production.

More information can be found in the various soil survey reports. Contact the local United States Department of Agriculture (USDA) Service Center for soil survey reports that include more detail specific to your location.

Parent Material Kind: alluvium and residuum
 Parent Material Origin: sandstone, shale
 Surface Texture: silt loam, loam, very fine sandy loam
 Surface Texture Modifier: none
 Subsurface Texture Group: clayey
 Surface Fragments ≤3” (% Cover): 0
 Surface Fragments >3” (%Cover): 0
 Subsurface Fragments ≤3” (% Volume): 0-20
 Subsurface Fragments >3” (% Volume): 0-10

	<u>Minimum</u>	<u>Maximum</u>
Drainage Class:	moderately well	well
Permeability Class:	very slow	very slow
Depth (inches):	20	80
Electrical Conductivity (mmhos/cm)*:	0	30
Sodium Absorption Ratio*:	0	30
Soil Reaction (1:1 Water)*:	5.6	9.6
Soil Reaction (0.1M CaCl ₂)*:	NA	NA
Available Water Capacity (inches)*:	4	6
Calcium Carbonate Equivalent (percent)*:	0	25

*These attributes represent from 0-40 inches or to the first restrictive layer.

Plant Communities

Ecological Dynamics of the Site

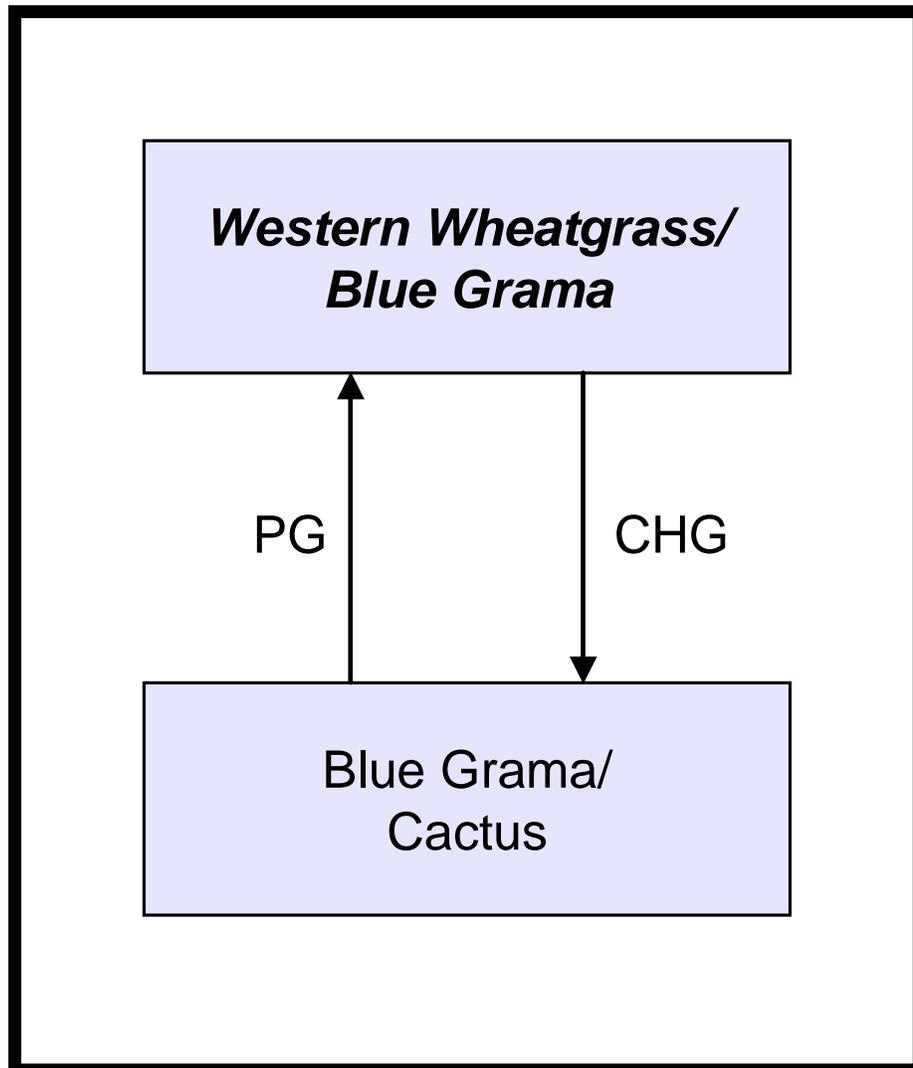
This site developed under Northern Great Plains climatic conditions, light to severe grazing by bison and other large herbivores, sporadic natural or man-caused wildfire (often of light intensities), and other biotic and abiotic factors that typically influence soil/site development. Changes will occur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

In association with this site are also areas of slick spots that usually have considerably more bare ground and are typically dominated by cactus. Slick spots are bare ground areas that are affected by high sodium concentrations. The soil factors are the dominant influence and grazing management is not necessarily the primary influence of these areas. These areas can occur as a complex with this site sometimes being difficult to differentiate between the two.

Interpretations are primarily based on the Western Wheatgrass/Blue Grama Plant Community. It has been determined by study of rangeland relic areas, areas protected from excessive disturbance, and areas under long-term rotational grazing regimes. Trends in plant community dynamics ranging from heavily grazed to lightly grazed areas, seasonal use pastures, and historical accounts also have been used. Plant communities, states, transitional pathways, and thresholds have been determined through similar studies and experience.

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

Plant Communities and Transitional Pathways



CHG – Continuous heavy grazing (heavy levels of grazing of a unit during most or all of the growing season); **PG** – Prescribed grazing (planned, controlled harvest of vegetation with grazing or browsing animals – see FOTG, Section IV, 528).

Plant Community Composition and Group Annual Production

COMMON/GROUP NAME	SYMBOL	Western Wheatgrass/Blue Grama			Blue Grama/Cactus			
		Group	lbs./acre	% Comp	Group	lbs./acre	% Comp	
GRASSES & GRASS-LIKES			800 - 900	80 - 90		350 - 425	70 - 85	
RHIZOMATOUS WHEATGRASSES		1	200 - 400	20 - 40	1	25 - 50	5 - 10	
western wheatgrass	PASM	1	200 - 400	20 - 40	1	25 - 50	5 - 10	
thickspike wheatgrass	ELLAL	1	0 - 100	0 - 10	1	0 - 25	0 - 5	
SHORT WARM-SEASON GRASSES		2	150 - 250	15 - 25	2	125 - 225	25 - 45	
blue grama	BOGR2	2	150 - 250	15 - 25	2	125 - 225	25 - 45	
buffalograss	BUDA	2	0 - 50	0 - 5	2	0 - 50	0 - 10	
COOL-SEASON GRASSES		3	50 - 200	5 - 20	3	0 - 50	0 - 10	
green needlegrass	NAVI4	3	10 - 100	1 - 10	3	0 - 15	0 - 3	
needleandthread	HECOC8	3	10 - 100	1 - 10	3	0 - 15	0 - 3	
Sandberg bluegrass	POSE	3	0 - 50	0 - 5	3	0 - 25	0 - 5	
prairie junegrass	KOMA	3	10 - 50	1 - 5	3	0 - 25	0 - 5	
NATIVE GRASSES & GRASS-LIKES		4	50 - 150	5 - 15	4	25 - 125	5 - 25	
prairie sandreed	CALO	4	0 - 20	0 - 2				
inland saltgrass	DISP	4	0 - 30	0 - 3	4	0 - 25	0 - 5	
tumblegrass	SCPA	4	0 - 20	0 - 2	4	0 - 15	0 - 3	
dropseed	SPORO	4	0 - 20	0 - 2	4	5 - 25	1 - 5	
little bluestem	SCSC	4	0 - 50	0 - 5	4	0 - 15	0 - 3	
threeawn	ARIST				4	5 - 25	1 - 5	
sedge	CAREX	4	20 - 100	2 - 10	4	15 - 75	3 - 15	
other perennial grasses	2GP	4	10 - 50	1 - 5	4	0 - 25	0 - 5	
other annual grasses	2GA	4	0 - 10	0 - 1	4	0 - 5	0 - 1	
NON-NATIVE GRASSES		5			5	10 - 25	2 - 5	
cheatgrass	BRTE				5	10 - 25	2 - 5	
FORBS		6	50 - 100	5 - 10	6	25 - 75	5 - 15	
cudweed sagewort	ARLU	6	0 - 10	0 - 1	6	5 - 15	1 - 3	
curlycup gumweed	GRSQ				6	0 - 25	0 - 5	
heath aster	SYER	6	10 - 20	1 - 2	6	5 - 15	1 - 3	
Hood's phlox	PHHO	6	0 - 10	0 - 1	6	5 - 10	1 - 2	
Lambert crazyweed	OXL3	6	10 - 20	1 - 2	6	5 - 10	1 - 2	
Nuttall's violet	VINU2	6	0 - 10	0 - 1				
prairie coneflower	RACO3	6	10 - 20	1 - 2	6	5 - 15	1 - 3	
rose pussytoes	ANRO2	6	0 - 10	0 - 1	6	5 - 10	1 - 2	
rush skeletonweed	LYJU	6	0 - 10	0 - 1	6	0 - 10	0 - 2	
salsify	TRAGO				6	5 - 15	1 - 3	
scarlet globemallow	SPCO	6	0 - 10	0 - 1	6	0 - 10	0 - 2	
silverleaf scurfpea	PEAR6	6	10 - 20	1 - 2	6	5 - 15	1 - 3	
sticky cinquefoil	POGL9	6	0 - 10	0 - 1	6	0 - 5	0 - 1	
sweetclover	MELIL				6	0 - 40	0 - 8	
wavyleaf thistle	CIUN	6	0 - 10	0 - 1	6	5 - 15	1 - 3	
western yarrow	ACMI2	6	10 - 20	1 - 2	6	5 - 15	1 - 3	
wild onion	ALLIU	6	0 - 10	0 - 1	6	0 - 15	0 - 3	
wild parsley	MUDI	6	0 - 10	0 - 1				
woolly Indianwheat	PLPA2	6	0 - 10	0 - 1	6	0 - 10	0 - 2	
other perennial forbs	2FP	6	0 - 20	0 - 2	6	0 - 10	0 - 2	
other annual forbs	2FA	6	0 - 20	0 - 2	6	0 - 20	0 - 4	
SHRUBS		7	20 - 100	2 - 10	7	25 - 75	5 - 15	
big sagebrush	ARTR2	7	0 - 20	0 - 2	7	0 - 15	0 - 3	
brittle cactus	OPFR	7	10 - 20	1 - 2	7	5 - 30	1 - 6	
broom snakeweed	GUSA2	7	0 - 20	0 - 2	7	5 - 25	1 - 5	
fringed sagewort	ARFR4	7	10 - 30	1 - 3	7	5 - 25	1 - 5	
plains pricklypear	OPPO	7	0 - 30	0 - 3	7	0 - 25	0 - 5	
rubber rabbitbrush	ERNA10	7	0 - 20	0 - 2	7	0 - 25	0 - 5	
saltbush	ATRIIP	7	0 - 20	0 - 2				
silver sagebrush	ARCA13	7	0 - 30	0 - 3	7	0 - 25	0 - 5	
winterfat	KRLA2	7	0 - 10	0 - 1				
other shrubs	2SHRUB	7	0 - 20	0 - 2	7	0 - 10	0 - 2	
Annual Production lbs./acre			LOW	RV	HIGH	LOW	RV	HIGH
GRASSES & GRASS-LIKES			440	865	1290	260	400	740
FORBS			45	75	105	20	50	80
SHRUBS			15	60	105	20	50	80
TOTAL			500	1000	1500	300	500	900

This list of plants and their relative proportions are based on near normal years. Fluctuations in species composition and relative production may change from year to year dependent upon precipitation or other climatic factors. RV = Representative value. Refer to PLANTS database for scientific names and codes: <http://plants.usda.gov>

Plant Community and Vegetation State Narratives

Following are the narratives for each of the described plant communities. These plant communities may not represent every possibility but they are the most prevalent and repeatable plant communities. The plant composition tables shown above have been developed from the best available knowledge at the time of this revision. As more data is collected, some of these plant communities may be revised or removed, and new ones may be added. None of these plant communities should necessarily be thought of as “Desired Plant Communities” (DPCs). According to the USDA Natural Resources Conservation Service (NRCS) National Range and Pasture Handbook, DPCs will be determined by the decision makers and will meet minimum quality criteria established by the NRCS. The main purpose for including any description of a plant community here is to capture the current knowledge and experience at the time of this revision.

Western Wheatgrass/Blue Grama Plant Community

Interpretations are based primarily on the Western Wheatgrass/Blue Grama Plant Community (this is also considered to be climax). This site evolved with grazing by large herbivores and occasional prairie fires. This plant community can be found on areas having a history of proper grazing management, including adequate recovery periods between grazing events. The potential vegetation is about 80 percent grasses or grass-like plants, 10 percent forbs, and 10 percent shrubs. The rhizomatous wheatgrasses dominate the plant community, while blue grama is also prevalent. Other grasses and grass-like plants occurring on the site include green needlegrass, needleandthread, buffalograss, Sandberg bluegrass, and sedges. Significant forbs include scarlet globemallow, cudweed sagewort, and heath aster. Shrubs occurring in this plant community include cactus, big sagebrush, saltbush, and fringed sagewort. Refer to the plant community composition and group annual production table for species composition and production.

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. Low to moderate available water capacity coupled with high accumulations of sodium and slow permeability strongly influences the soil-water-plant relationships.

The following growth curve is an estimate of the monthly percentages of total annual growth of the dominant species expected during an average year:

Growth curve number: NE6402

Growth curve name: Pine Ridge/Badlands, cool-season dominant, warm-season subdominant.

Growth curve description: Cool-season dominant, warm-season subdominant.

JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
0	0	5	10	25	30	15	5	5	5	0	0

Transitional pathways and/or community pathways leading to other plant communities are as follows:

- Heavy, continuous grazing will convert the plant community to the *Blue Grama/Cactus Plant Community*.

Blue Grama/Cactus Plant Community

This plant community can develop from the adverse effects of heavy continuous grazing and/or annual, spring seasonal grazing. Short grasses and cactus increase to dominate the site and annual production decreases dramatically. Lack of litter and short plant heights result in higher soil temperatures, poor water infiltration rates, and high evaporation, which gives blue grama a competitive advantage over cool-season midgrasses. This plant community can occur throughout the pasture, on spot grazed areas, and around water sources where season-long grazing patterns occur.

Blue grama and cactus are the dominant species. Other grasses and grass-likes occurring include western wheatgrass, sedge, buffalograss, inland saltgrass, needleandthread, prairie Junegrass, and annual grasses. Forbs such as brome snakeweed, cudweed sagewort, heath aster, and western yarrow may also be present. Some nonnative species will begin to invade this plant community including salsify, sweet clover, and annual bromes. There is usually more than 25 percent bare ground. Refer to the plant community composition and group annual production table for species composition and production.

This plant community is quite resilient. The thick sod and competitive advantage prevents other species from establishing. This plant community is less productive than the Western Wheatgrass/Blue Grama Plant Community. Runoff increases and infiltration will decrease. Soil erosion will be minimal due to the sod forming habit of blue grama.

The following growth curve is an estimate of the monthly percentages of total annual growth of the dominant species expected during an average year:

Growth curve number: NE6405

Growth curve name: Pine Ridge/Badlands, warm-season dominant.

Growth curve description: Warm-season dominant.

JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
0	0	3	7	15	20	30	15	5	5	0	0

Transitional pathways and/or community pathways leading to other plant communities are as follows:

- Prescribed grazing can shift this plant community back to the *Western Wheatgrass/Blue Grama Plant Community*.

Ecological Site Interpretations

Animal Community – Wildlife Interpretations

MLRA 64 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 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 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 64, the Thin Claypan Ecological Site (ES) provides upland grassland cover with an associated forb, shrub, and tree component. It was typically part of an expansive grassland landscape that included combinations of Badlands, Thin Breaks, Clayey, Claypan, Dense Clay, Loamy, Saline, Sandy, Shallow, Overflow, Subirrigated, and Terrace ESs. 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 Thin Claypan ES remains intact and provides increasingly important habitat for grassland and shrub steppe nesting birds, small rodents, coyotes, and a variety of reptiles, amphibians, and insects. Invasive species such as annual bromegrasses and crested wheatgrass have impacted the biological integrity of the site for some grassland birds. Changes in historic fire regime and domestic grazing have impacted the forb/shrub/grass percentages.

Western Wheatgrass/Blue Grama (HCPC): The predominance of grasses plus high diversity of forbs and shrubs in this community favors grazers and mixed-feeders, such as deer and pronghorn. Insects, such as pollinators, play a large role in maintaining the forb community and provide a forage base for grassland birds and other species. The complex plant structural diversity provides habitat for a wide array of migratory and resident birds. Grasshopper sparrow, lark bunting, western meadowlark, and sharp-tailed grouse are common and benefit from the structure and composition this plant community provides. This site provides important breeding habitat for the loggerhead shrike. This site provides excellent nesting and brood rearing habitat for sharp-tailed grouse. Diverse prey populations are available for grassland raptors such as northern harrier, ferruginous hawk, Swainson's hawk, golden eagle, and prairie falcon.

The diversity of grasses, forbs, and shrubs provide high nutrition levels for small and large herbivores including voles, mice, spotted ground squirrels, white- and black-tailed jackrabbit, and deer. This ES provides excellent wintering habitat for pronghorn. The moderate stature of this plant community provides suitable thermal, protective, and escape cover for small herbivores and grassland birds. Predators utilizing this plant community including coyote, American badger, red fox, and long-tailed weasel. This plant community provides habitat for spade foot toad, Great Plains toad, bull snake, and prairie rattlesnake.

Blue Grama/Cactus: Resulting from heavy continuous grazing and/or annual, spring seasonal grazing, blue grama, and cactus will dominate. Forb diversity decreases and abundance has remained relatively unchanged. Shrub abundance significantly increases, especially cacti and, to a lesser extent, big sagebrush.

A shift to shorter plant structure will favor prairie dog expansion and associate species such as ferruginous hawk, burrowing owl, and swift fox. Species such as horned lark, long-billed curlew, upland sandpiper, and white- and black-tailed jackrabbit may be present, while species such as desert cotton tail will increase. This plant community may provide areas suitable for sharp-tailed grouse lek site development.

The short stature of this plant community limits suitable thermal, protective, and escape cover. Predators utilizing this plant community include the coyote, American badger, red fox, and long-tailed weasel. This plant community provides habitat for spade foot toad, Great Plains toad, bull snake, and prairie rattlesnake.

Animal Preferences (Quarterly – 1,2,3,4[†])

Common Name	Cattle	Sheep	Horses	Deer	Antelope	Bison	Elk
Grasses & Grass-likes							
blue grama	U D P U	D P P D	U D P U	D P P D	D P P D	U D P U	U D P U
buffalograss	U U D U	N U D U	U U D U	N U D U	N U D U	U U D U	U U D U
dropseed	N U N N	N U N N	N U N N	N U N N	N U N N	N U N N	N U N N
green needlegrass	U P U D	N P N P	U P U D	N P N P	N P N P	U P U D	U P U D
inland saltgrass	N U U N	N N N N	N U U N	N N N N	N N N N	N U U N	N U U N
little bluestem	U D D U	N D N N	U D D U	N D N N	N D N N	U D D U	U D D U
needleandthread	U D U D	N D N U	U D U D	N D N U	N D N U	U D U D	U D U D
prairie junegrass	U D U D	N D N U	U D U D	N D N U	N D N U	U D U D	U D U D
prairie sandreed	U D D U	U D U U	U D D U	U U D U	U U D U	U D D U	U D D U
Sandberg bluegrass	N U N N	N D N N	N U N N	N D N N	N D N N	N U N N	N U N N
sedge	U D U D	U P N D	U D U D	U D U D	U D U D	U D U D	U D U D
thickspike wheatgrass	U D D U	N D N N	U D D U	N D N N	N D N N	U D D U	U D D U
tumblegrass	N N N N	N N N N	N N N N	N N N N	N N N N	N N N N	N N N N
western wheatgrass	U P D U	N D N N	U P D U	N D N N	N D N N	U P D U	U P D U
Forbs							
cudweed sagewort	U U U U	U U D U	U U U U	U U D U	U U D U	U U U U	U U D U
heath aster	U U D U	U U P U	U U D U	U U P U	U U P U	U U D U	U U P U
Hood's phlox	U D U U	U P P U	U D U U	U P P U	U P P U	U D U U	U P P U
Lambert crazyweed	T T T T	T T T T	T T T T	T T T T	T T T T	T T T T	T T T T
Nuttall's violet	U D U U	U P P U	U D U U	U P P U	U P P U	U D U U	U P P U
prairie coneflower	U U D U	U P P U	U U D U	U P P U	U P P U	U U D U	U P P U
rose pussytoes	U U U U	U U U U	U U U U	U U U U	U U U U	U U U U	U U U U
rush skeletonweed	U U U U	N N N N	U U U U	N N N N	N N N N	U U U U	N N N N
scarlet globemallow	U U D U	U D D U	U U D U	U D D U	U D D U	U U D U	U D D U
silverleaf scurfpea	U U U U	N U U N	U U U U	N U U N	N U U N	U U U U	N U U N
sticky cinquefoil	U U U U	U U D U	U U U U	U U D U	U U D U	U U U U	U U D U
wavyleaf thistle	U U U U	N N N N	U U U U	N N N N	N N N N	U U U U	N N N N
western yarrow	U U U U	N U U N	U U U U	N U U N	N U U N	U U U U	N U U N
wild onion	U D U U	U D D U	U D U U	U D D U	U D D U	U D U U	U D D U
wild parsley	U D U U	U D D U	U D U U	U D D U	U D D U	U D U U	U D D U
woolly Indianwheat	U U U U	N U U N	U U U U	N U U N	N U U N	U U U U	N U U N
Shrubs							
big sagebrush	U N U U	D U U D	U N U U	P U D P	P P P P	U N U U	D U U U
brittle cactus	N N N N	N N N N	N N N N	N N N N	N N N N	N N N N	N N N N
broom snakeweed	N N N N	U U U U	N N N N	U U U U	U U U U	N N N N	U U U U
fringed sagewort	U U U U	U U U U	U U U U	U D D U	U P P D	U U U U	U U U D
plains pricklypear	N N N N	N N N N	N N N N	N N N N	N N N N	N N N N	N N N N
rubber rabbitbrush	N N N N	D U U D	N N N N	D U U D	U D D U	N N N N	D U U U
saltbush	P D D P	P D D P	P D D P	P D D P	P D D P	P D D P	P D D P
silver sagebrush	D U U D	D U U D	D U U D	P D D P	P P P P	D U U D	D U U D
winterfat	P P P P	P P P P	P P P P	P P P P	P P P P	P P P P	P P P P

N = not used; **U** = undesirable; **D** = desirable; **P** = preferred; **T** = toxic

[†] Quarters: 1 – Jan., Feb., Mar.; 2 – Apr., May, Jun.; 3 – Jul., Aug., Sep.; 4 – Oct., Nov., Dec.

Animal Community – Grazing Interpretations

The following table lists annual, suggested initial stocking rates with average growing conditions. These are conservative estimates that should be used only as guidelines in the initial stages of conservation planning. Often, the current plant composition does not entirely match any particular plant community (as described in this ES description). Because of this, a resource inventory is necessary to document plant composition and production. More accurate carrying capacity estimates 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. With consultation of the land manager, more intensive grazing management may result in improved harvest efficiencies and increased carrying capacity.

Plant Community	Average Annual Production (lbs./acre, air-dry)	Stocking Rate* (AUM/acre)
Western Wheatgrass/Blue Grama	1,000	0.32
Blue Grama/Cactus	500	0.15

*Based on 790 lbs./acre (air-dry weight) per Animal Unit Month (AUM) and on 25 percent harvest efficiency (refer to USDA NRCS, National Range and Pasture Handbook).

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.

Hydrology Functions

Water is the principal factor limiting herbage production on this site. The site is dominated by soils in hydrologic group D. Infiltration varies from moderate to very slow and runoff potential varies from medium to very high depending on soil hydrologic group, 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 a dense sod of short grasses dominates the site. 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).

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 present on the site.

Other Products

Seed harvest of native plant species can provide additional income on this site.

Supporting Information

Associated Sites

(064XY014NE) – Clayey 14-17" P.Z.
(064XY044NE) – Claypan

(064XY035NE) – Clayey 17-20" P.Z.
(064XY045NE) – Dense Clay

Similar Sites

(064XY014NE & 064XY035NE) – Clayey 14-17” P.Z. & Clayey 17-20” P.Z. [more green needlegrass; higher production]

(064XY044NE) – Claypan [more production; more western wheatgrass and green needlegrass]

Inventory Data References

Information presented here has been derived from NRCS clipping data and other inventory data. Field observations from range-trained personnel were also used. Those involved in developing this site include: Stan Boltz, Range Management Specialist (RMS), NRCS; Jill Epley, RMS, NRCS; Rick Peterson, RMS, NRCS; David Steffen, RMS, NRCS; Jeff Vander Wilt; RMS, NRCS; and Phil Young, Soil Scientist, NRCS.

<u>Data Source</u>	<u>Number of Records</u>	<u>Sample Period</u>	<u>State</u>	<u>County</u>
SCS-RANGE-417				

State Correlation

This site has been correlated with NE, SD, and WY in MLRA 64.

Field Offices/Counties

Alliance, NE	Box Butte	Kadoka, SD	Jackson	Rushville, NE	Sheridan
Bridgeport, NE	Morrill	Lusk, WY	Niobrara	Scottsbluff, NE	Scottsbluff
Chadron, NE	Dawes/Sioux	Martin, SD	Bennett/Shannon	Torrington, WY	Goshen
Custer, SD	Custer	Pine Ridge, SD	Pine Ridge IR	Valentine, NE	Cherry
Douglas, WY	Converse	Rapid City, SD	Pennington	Wall, SD	East Pennington
Hot Springs, SD	Fall River	Rosebud, SD	Rosebud IR	Wheatland, WY	Platte
White River, SD	Mellette/Todd				

Relationship to Other Established Classifications

Level IV Ecoregions of the Conterminous United States: 25a – Pine Ridge Escarpment, 43h – White River Badlands, and 43i – Keya Paha Tablelands.

Other References

High Plains Regional Climate Center, University of Nebraska, 830728 Chase Hall, Lincoln, NE 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://soils.usda.gov/technical/nasis/>)

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.

Site Description Approval

NE, State Range Management Specialist

Date

SD, State Range Management Specialist

Date

WY, State Range Management Specialist

Date