

United States Department of Agriculture Natural Resources Conservation Service

Ecological Site Description

Site Type: Rangeland

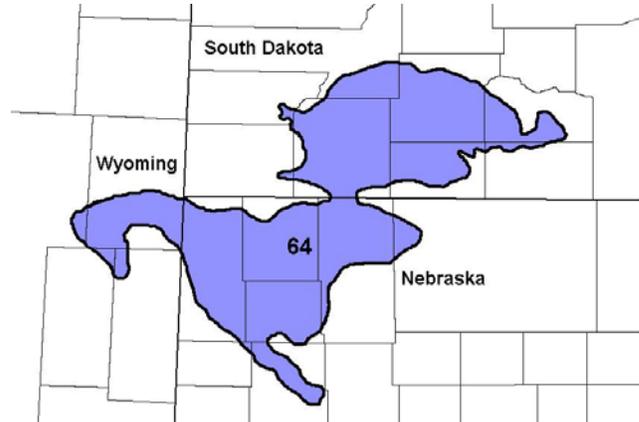
Site Name: Loamy Overflow

Site ID: R064XY026NE

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

Physiographic Features

This site occurs on nearly level areas that receive additional water from overflow of intermittent streams or runoff from adjacent slopes.



Landform: flood plain, stream terrace, and swale

Aspect: N/A

	<u>Minimum</u>	<u>Maximum</u>
Elevation (feet):	2900	4000
Slope (percent):	0	5
Water Table Depth (inches):	42	>72
Flooding:		
Frequency:	Rare	Frequent
Duration:	Very brief	Brief
Ponding:		
Depth (inches):	None	None
Frequency:	None	None
Duration:	None	None
Runoff Class:	Negligible	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, SD) to about 25° F (Hemingford, NE). July is the warmest month with temperatures averaging from about 70° F (Keeline 3 W, WY) to about 76° F (Wood, SD). The range of normal average monthly temperatures between the coldest and warmest months is about 55° F. This large annual range attests to the continental nature of this area's climate. Hourly winds average about 11 miles per hour annually, ranging from about 13 miles per hour during the spring to about 10 miles per hour during the summer. Daytime winds are generally stronger than nighttime and occasional strong storms may bring brief periods of high winds with gusts to more than 50 miles per hour.

Growth of cool season plants begins in early to mid March, slowing or ceasing in late June. Warm season plants begin growth about mid May and continue to early or mid September. Green up of cool season plants may occur in September and October when adequate soil moisture is present.

	<u>Minimum</u>	<u>Maximum</u>
Frost-free period (days):	115	143
Freeze-free period (days):	137	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

Stream Type: B6, C6
(Rosgen System)

Representative Soil Features

The soils of this site are very deep, moderately well to well drained soils that formed in alluvium. These soils have slow to moderate permeability. The surface layer will vary from 3 to 15 inches deep and have one of the following textures: very fine sandy loam, loam, silt loam, and silty clay loam. These areas receive additional water from overflow of intermittent streams or runoff from adjacent slopes. Available water capacity is typically high. The general fertility level and organic content of these soils is medium to high. 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. Sub-surface soil layers are not restrictive to water movement and root penetration.

These soils are mainly susceptible to water erosion. Headcuts may develop if adequate vegetative cover is not maintained. A drastic loss of the soil surface layer 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 USDA Service Center for soil survey reports that include more detail specific to your location.

Parent Material Kind: alluvium
Parent Material Origin: mixed
Surface Texture: silt loam, silty clay loam, loam
Surface Texture Modifier: none
Subsurface Texture Group: loamy
Surface Fragments $\leq 3''$ (% Cover): 0
Surface Fragments $> 3''$ (%Cover): 0
Subsurface Fragments $\leq 3''$ (% Volume): 0-10
Subsurface Fragments $> 3''$ (% Volume): 0-5

	<u>Minimum</u>	<u>Maximum</u>
Drainage Class:	moderately well	well
Permeability Class:	slow	moderate
Depth (inches):	>72	>72
Electrical Conductivity (mmhos/cm)*:	0	8
Sodium Absorption Ratio*:	0	10
Soil Reaction (1:1 Water)*:	6.1	9.0
Soil Reaction (0.1M CaCl₂)*:	NA	NA
Available Water Capacity (inches)*:	6	8
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:

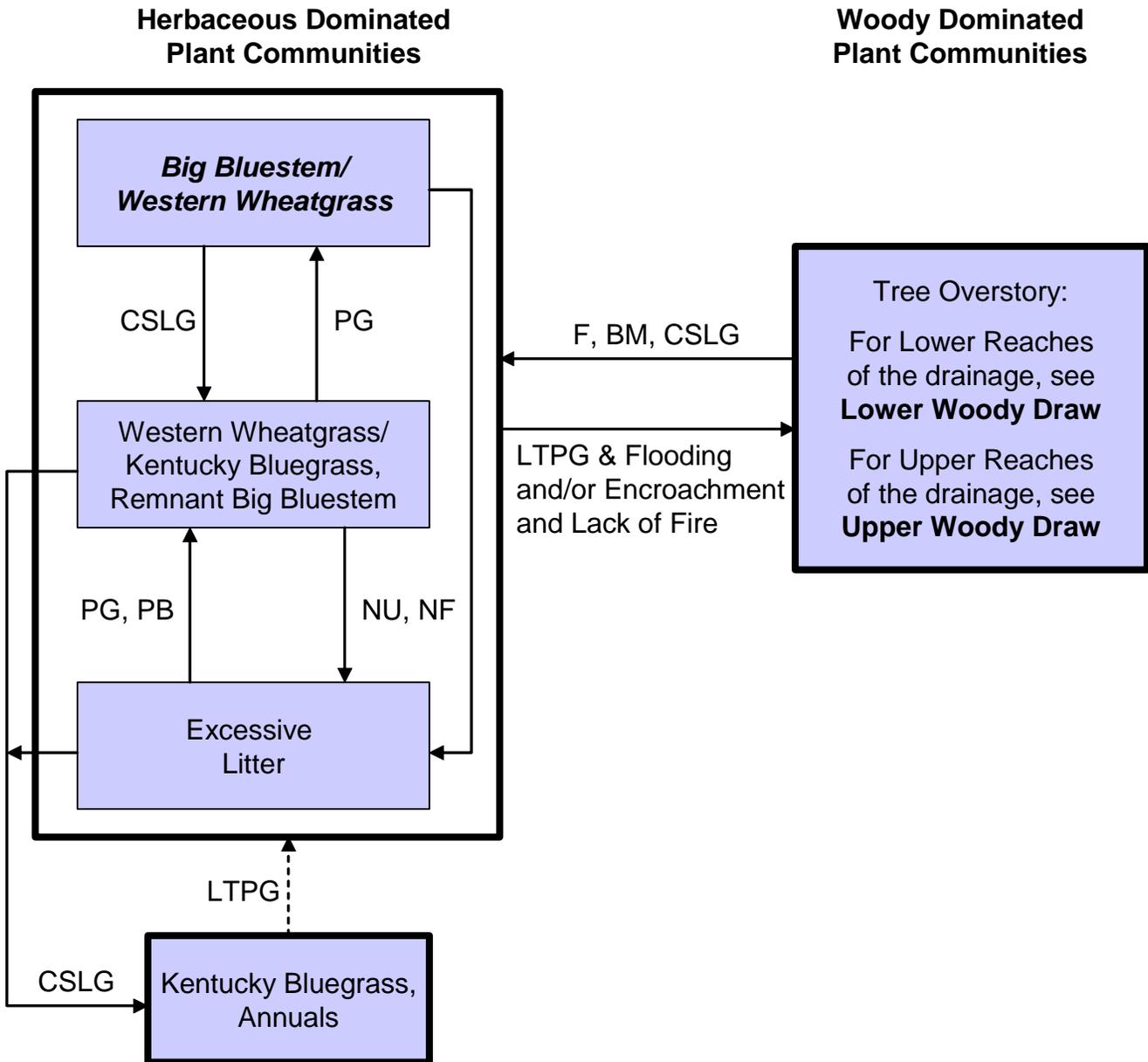
This site developed under Northern Great Plains climatic conditions, light to severe grazing by bison and other large herbivores, sporadic natural or man-caused wildfire (often of light intensities), and other biotic and abiotic factors that typically influence soil/site development. Changes will occur 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 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.

Continuous season-long grazing (during the typical growing season of May through October) and/or repeated seasonal grazing (e.g., every spring, every summer) without adequate recovery periods following each grazing occurrence causes this site to depart from the Big Bluestem/Western Wheatgrass Plant Community. Western wheatgrass increases initially and will eventually decrease with continuous grazing. Grasses such as big bluestem, prairie cordgrass and switchgrass will decrease in frequency and production. Introduced species such as Kentucky bluegrass, cheatgrass and smooth brome grass invade the site as a result of inadequate recovery periods between grazing events and overstocking. Where trees dominate the site, woody regeneration will decline and grasses and forbs will become dominant in the understory. It is thought that the climax is an herbaceous dominated site on higher landscape positions where trees encroach from the adjacent Thin Breaks site, and flooding events are infrequent. Loamy Overflow sites occupying lower landscape positions or plant communities adjacent to riparian areas will typically be dominated by a mixed hardwood overstory.

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

The following is a diagram that illustrates the common plant communities that can occur on the site and the transition pathways between communities. The ecological processes will be discussed in more detail in the plant community descriptions following the diagram.

Plant Communities and Transitional Pathways



BM - Brush management (fire, chemical, mechanical); **CSLG** - Continuous season-long grazing (grazing a unit for an entire growing season); **F** - Fire; **LTPG** - Long-term prescribed grazing; **NF** - No fire; **NU** - Non use; **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	Big Bluestem/Western Wheatgrass			Western Wheatgrass/Kentucky Bluegrass, Big Bluestem Remnant			Kentucky Bluegrass, Annuals			Excessive Litter			
		Grp	lbs./acre	% Comp	Grp	lbs./acre	% Comp	Grp	lbs./acre	% Comp	Grp	lbs./acre	% Comp	
GRASSES & GRASS-LIKES			2550 - 2850	85 - 95		1840 - 2185	80 - 95		750 - 900	75 - 90		1280 - 1520	80 - 95	
WHEATGRASS		1	600 - 900	20 - 30	1	690 - 920	30 - 40	1	20 - 50	2 - 5	1	80 - 240	5 - 15	
western wheatgrass	PASM	1	600 - 900	20 - 30	1	690 - 920	30 - 40	1	20 - 50	2 - 5	1	80 - 240	5 - 15	
slender wheatgrass	ELTRT	1	0 - 150	0 - 5	1	0 - 69	0 - 3							
NEEDLEGRASS		2	150 - 300	5 - 10	2	23 - 115	1 - 5	2	0 - 10	0 - 1	2	16 - 48	1 - 3	
green needlegrass	NAV4	2	60 - 150	2 - 5	2	0 - 115	0 - 5				2	16 - 48	1 - 3	
needleandthread	HECOC8	2	150 - 300	5 - 10	2	23 - 115	1 - 5	2	0 - 10	0 - 1	2	0 - 48	0 - 3	
TALL WARM-SEASON GRASSES		3	900 - 1200	30 - 40	3	115 - 345	5 - 15	3	10 - 20	1 - 2	3	32 - 160	2 - 10	
big bluestem	ANGE	3	900 - 1350	30 - 45	3	115 - 345	5 - 15	3	10 - 20	1 - 2	3	32 - 160	2 - 10	
prairie cordgrass	SPPE	3	0 - 30	0 - 1										
switchgrass	PAV12	3	150 - 450	5 - 15	3	0 - 115	0 - 5				3	16 - 80	1 - 5	
NATIVE GRASSES/GRASS-LIKES		4	150 - 300	5 - 10	4	23 - 115	1 - 5	4	10 - 50	1 - 5	4	16 - 80	1 - 5	
blue grama	BOGR2	4	30 - 150	1 - 5	4	23 - 46	1 - 2				4	0 - 32	0 - 2	
buffalograss	BUDA	4	30 - 150	1 - 5	4	0 - 46	0 - 2				4	0 - 32	0 - 2	
Canada wildrye	ELCA4	4	60 - 150	2 - 5	4	0 - 115	0 - 5				4	0 - 48	0 - 3	
little bluestem	SCSC	4	0 - 150	0 - 5	4	0 - 115	0 - 5				4	0 - 32	0 - 2	
prairie junegrass	KOMA	4	0 - 60	0 - 2	4	0 - 23	0 - 1							
sand dropseed	SPCR	4	30 - 90	1 - 3	4	23 - 69	1 - 3	4	10 - 30	1 - 3	4	32 - 80	2 - 5	
sedge	CAREX	4	150 - 300	5 - 10	4	23 - 115	1 - 5	4	10 - 50	1 - 5	4	16 - 80	1 - 5	
sideoats grama	BOCU	4	0 - 60	0 - 2	4	0 - 46	0 - 2				4	0 - 16	0 - 1	
fall dropseed	SPCOC2	4	30 - 150	1 - 5	4	23 - 69	1 - 3	4	10 - 20	1 - 2	4	32 - 80	2 - 5	
green muhly	MURA	4	0 - 120	0 - 4										
Sandberg bluegrass	POSE	4	0 - 90	0 - 3	4	0 - 46	0 - 2				4	0 - 32	0 - 2	
other perennial grasses	2GP	4	0 - 90	0 - 3	4	0 - 46	0 - 2	4	0 - 30	0 - 3	4	0 - 48	0 - 3	
NON-NATIVE GRASSES		5			5	230 - 460	10 - 20	5	350 - 500	35 - 50	5	240 - 400	15 - 25	
Kentucky bluegrass	POPR				5	230 - 460	10 - 20	5	350 - 500	35 - 50	5	240 - 400	15 - 25	
smooth bromegrass	BRIN2				5	0 - 115	0 - 5	5	20 - 150	2 - 15	5	16 - 80	1 - 5	
cheatgrass	BRTE				5	23 - 115	1 - 5	5	20 - 100	2 - 10	5	32 - 160	2 - 10	
FORBS		6	150 - 300	5 - 10	6	115 - 230	5 - 10	6	100 - 200	10 - 20	6	80 - 160	5 - 10	
American licorice	GLLE3	6	30 - 90	1 - 3	6	23 - 115	1 - 5	6	0 - 50	0 - 5	6	0 - 48	0 - 3	
American vetch	VIAM	6	30 - 90	1 - 3	6	23 - 69	1 - 3							
aster	ASTER	6	30 - 90	1 - 3	6	0 - 69	0 - 3	6	20 - 50	2 - 5	6	16 - 48	1 - 3	
burdock	ARCTI				6	0 - 46	0 - 2	6	0 - 30	0 - 3	6	0 - 48	0 - 3	
common mullein	VETH				6	23 - 115	1 - 5	6	10 - 80	1 - 8	6	16 - 160	1 - 10	
cutweed sagewort	ARLU	6	30 - 90	1 - 3	6	23 - 69	1 - 3	6	20 - 50	2 - 5	6	16 - 48	1 - 3	
curly dock	RUCR				6	0 - 46	0 - 2	6	0 - 50	0 - 5	6	0 - 48	0 - 3	
false boneset	BREU	6	0 - 90	0 - 3	6	0 - 23	0 - 1				6	0 - 32	0 - 2	
false Solomon's-seal	MAST4	6	0 - 90	0 - 3	6	0 - 23	0 - 1							
giant ragweed	AMTR	6	0 - 90	0 - 3	6	0 - 23	0 - 1							
goldenrod	SOLID	6	30 - 90	1 - 3	6	23 - 69	1 - 3	6	10 - 50	1 - 5	6	16 - 48	1 - 3	
nettle	URTIC	6	0 - 90	0 - 3	6	0 - 46	0 - 2	6	0 - 30	0 - 3	6	0 - 48	0 - 3	
prairie coneflower	RACO3	6	0 - 90	0 - 3	6	23 - 69	1 - 3				6	16 - 48	1 - 3	
scarlet gaura	GACO5	6	0 - 90	0 - 3	6	23 - 69	1 - 3	6	0 - 30	0 - 3	6	0 - 16	0 - 1	
scurfpea	PSORA2	6	0 - 90	0 - 3	6	23 - 69	1 - 3	6	20 - 50	2 - 5	6	16 - 48	1 - 3	
verbena	VERBE	6	0 - 90	0 - 3	6	23 - 69	1 - 3	6	10 - 30	1 - 3	6	16 - 48	1 - 3	
western ragweed	AMPS	6	0 - 60	0 - 2	6	23 - 115	1 - 5	6	50 - 150	5 - 15	6	32 - 80	2 - 5	
western yarrow	ACMI2	6	0 - 90	0 - 3	6	23 - 69	1 - 3	6	10 - 50	1 - 5	6	16 - 48	1 - 3	
other annual forbs	2FA	6	0 - 90	0 - 3	6	23 - 115	1 - 5	6	20 - 50	2 - 5	6	32 - 160	2 - 10	
other perennial forbs	2FP	6	0 - 90	0 - 3	6	23 - 115	1 - 5	6	10 - 50	1 - 5	6	32 - 80	2 - 5	
SHRUBS		7	30 - 150	1 - 5	7	23 - 230	1 - 10	7	10 - 50	1 - 5	7	16 - 160	1 - 10	
American plum	PRAM	7	0 - 150	0 - 5	7	0 - 46	0 - 2	7	10 - 30	1 - 3	7	0 - 32	0 - 2	
chokecherry	PRVI	7	0 - 150	0 - 5	7	0 - 46	0 - 2				7	0 - 32	0 - 2	
golden currant	RIAU	7	0 - 90	0 - 3	7	0 - 23	0 - 1				7	0 - 16	0 - 1	
leadplant	AMCA6	7	0 - 90	0 - 3	7	0 - 23	0 - 1							
rose	ROSA5	7	30 - 90	1 - 3	7	23 - 115	1 - 5	7	10 - 50	1 - 5	7	16 - 80	1 - 5	
silver buffaloberry	SHAR	7	0 - 150	0 - 5	7	0 - 69	0 - 3				7	0 - 32	0 - 2	
western snowberry	SYOC	7	30 - 150	1 - 5	7	23 - 115	1 - 5	7	10 - 50	1 - 5	7	16 - 112	1 - 7	
other shrubs	2SHRUB	7	0 - 90	0 - 3	7	0 - 46	0 - 2	7	0 - 20	0 - 2	7	0 - 32	0 - 2	
TREES		8	0 - 30	0 - 1	8			8			8	0 - 16	0 - 1	
American elm	ULAM	8	0 - 30	0 - 1							8	0 - 16	0 - 1	
boxelder	ACNE2	8	0 - 30	0 - 1							8	0 - 16	0 - 1	
bur oak	QUMA2	8	0 - 30	0 - 1							8	0 - 16	0 - 1	
green ash	FRPE	8	0 - 30	0 - 1							8	0 - 16	0 - 1	
hackberry	CEOC	8	0 - 30	0 - 1							8	0 - 16	0 - 1	
hawthorn	CRATA	8	0 - 30	0 - 1							8	0 - 16	0 - 1	
plains cottonwood	PODEM	8	0 - 30	0 - 1							8	0 - 16	0 - 1	
other trees	2TREE	8	0 - 30	0 - 1							8	0 - 16	0 - 1	
Annual Production lbs./acre			LOW	RV	HIGH	LOW	RV	HIGH	LOW	RV	HIGH	LOW	RV	HIGH
GRASSES & GRASS-LIKES			2030	2670	2885	1670	2001	2200	400	820	1140	810	1384	1850
FORBS			145	225	325	110	173	250	95	150	205	75	120	165
SHRUBS			25	90	155	20	127	250	5	30	55	15	88	165
TREES			0	15	35							0	8	20
TOTAL			2200	3000	3400	1800	2300	2700	500	1000	1400	900	1600	2200

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 are 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”. According to the USDA NRCS National Range and Pasture Handbook, Desired Plant Communities (DPC’s) 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.

Big Bluestem/Western Wheatgrass Plant Community

Interpretations are based primarily on the Big Bluestem/Western Wheatgrass Plant Community (this is also considered to be climax). Potential vegetation is about 85% grasses or grass-like plants, 10% forbs, and 5% shrubs. The plant community is dominated by both warm and cool season grasses. The major grasses include big bluestem and western wheatgrass. Other grasses and grass-likes include switchgrass and sedges. Forbs consist of American licorice, American vetch, aster species, and goldenrod. Woody species included in the plant community are western snowberry and rose. The potential is relatively low for tree establishment or regeneration.

This plant community is productive and diverse. The diversity in plant species allows for high drought tolerance. This is a sustainable plant community in regards to site/soil stability, watershed function, and biologic integrity.

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: NE6408

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

Growth curve description: Cool-season, warm-season co-dominant, lowland.

JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
0	0	5	12	20	25	19	11	5	3	0	0

Transitions or pathways leading to other plant communities are as follows:

- Continuous season-long grazing will shift this plant community toward the *Western Wheatgrass/Kentucky Bluegrass, Remnant Big Bluestem Plant Community*.
- Flooding, long-term prescribed grazing and lack of fire are necessary to shift this plant community to the *Cottonwood, Prunus/Snowberry Midstory Plant Community* on the lower reaches of the drainage. Flooding reduces herbaceous competition through scouring of the soil surface, and provides a site for regeneration to occur. Once a flooding event occurs during the proper time, a long-term period of prescribed grazing is necessary to establish and maintain a woody plant community. Grazing during the mid-summer growing season typically has an adverse affect on woody regeneration.
- Encroachment and no fire will typically shift this plant community to the *Prunus/Snowberry, Grasses & Forbs, and Tree Seedlings Plant Community* on the upper reaches of the drainage. The woody shrubs often provide a microclimate for tree establishment, and prescribed grazing will allow for tree establishment.
- Prescribed grazing that allows for adequate recovery opportunity following each grazing event and proper stocking will maintain the *Big Bluestem/Western Wheatgrass Plant Community*.
- Non-use and/or no fire will move this plant community to the *Excessive Litter Plant Community*.

Western Wheatgrass/Kentucky Bluegrass, Remnant Big Bluestem Plant Community

This plant community is a result continuous season-long grazing. Western wheatgrass has increased. Big bluestem has decreased but remains in remnant amounts. Other grasses and grass-likes include switchgrass, sand dropseed, tall dropseed and sedges. The potential is low for any woody regeneration. Kentucky bluegrass has invaded and is beginning to dominate the plant community.

Production and diversity has declined compared to the Big Bluestem/Western Wheatgrass Plant Community. Loss of warm season grasses has negatively impacted energy flow and nutrient cycling. Water infiltration can be reduced due to the shallow root system, characteristic of Kentucky bluegrass.

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: NE6407

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

Growth curve description: Cool-season dominant, warm-season sub-dominant, lowland.

JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
0	0	5	8	25	30	15	10	2	5	0	0

Transitional pathways leading to other plant communities are as follows.

- Prescribed grazing and proper stocking may eventually return this plant community to the *Big Bluestem, Western Wheatgrass Plant Community*.
- Flooding and long-term prescribed grazing and/or encroachment and lack of fire are necessary to shift this plant community to the *Cottonwood, Prunus/Snowberry Midstory Plant Community* on the lower reaches of the drainage. Flooding reduces herbaceous competition through scouring of the soil surface, and provides a site for regeneration to occur. Once a flooding event occurs during the proper time, a long-term period of prescribed grazing is necessary to establish and maintain a woody plant community. Grazing during the mid-summer growing season typically has an adverse affect on woody regeneration.
- Encroachment and no fire will typically shift this plant community to the *Prunus/Snowberry, Grasses & Forbs, and Tree Seedlings Plant Community* on the upper reaches of the drainage. The woody shrubs often provide a microclimate for tree establishment, and prescribed grazing will allow for tree establishment.
- Continuous season-long grazing will shift this plant community toward the *Kentucky Bluegrass, Annuals Plant Community*.
- Non-use and/or no fire will move this plant community to the *Excessive Litter Plant Community*.

Excessive Litter Plant Community

This plant community developed under extended periods of non-use and no fire. Initially, the dominant grasses include western wheatgrass and big bluestem. Other grasses and grass-likes may include switchgrass, dropseeds, and sedges. With continued non-use and no fire, the plant community becomes dominated by Kentucky bluegrass, western wheatgrass and annual grasses. Forbs include common mullein, western ragweed, scurfpeas, cudweed sagewort, and verbenas. Shrubs in this community include rose and western snowberry.

Warm season grasses have decreased along with production and vigor. Soil erosion is low.

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: NE6406

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

Growth curve description: Cool-season dominant, lowland.

JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
0	0	5	13	28	28	12	5	6	3	0	0

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

- With prescribed grazing, or prescribed burning followed by prescribed grazing this plant community will move toward the *Western Wheatgrass/Kentucky Bluegrass, Remnant Big Bluestem Plant Community*. Managed high stock densities and stocking rates during the growing season, or burning, will remove heavy buildup of litter.

Kentucky Bluegrass, Annuals Plant Community

This plant community developed under continuous season-long grazing. It is dominated by Kentucky bluegrass, annual brome and other annual grasses and forbs. The dominant forbs include common mullein, western ragweed, scurpeas, cudweed sagewort, and verbenas. Dominant shrubs in this community include snowberry, and rose. Compared to the Western Wheatgrass/Kentucky Bluegrass, Remnant Big Bluestem Plant Community, Kentucky bluegrass increases significantly and western wheatgrass and big bluestem has decreased significantly. Plant diversity and productivity has declined.

This plant community is resistant to change, and if disturbed, it is resilient. Bluegrass will increase under grazing pressure. Cool, moist climatic conditions will also tend to increase bluegrass production. Soil erosion is low. Compared to the Big Bluestem/Western Wheatgrass Plant Community, infiltration is reduced, and runoff increases. Once this plant community is reached, time and external resources will be needed to see any immediate recovery in the diversity.

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: NE6406

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

Growth curve description: Cool-season dominant, lowland.

JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
0	0	5	13	28	28	12	5	6	3	0	0

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

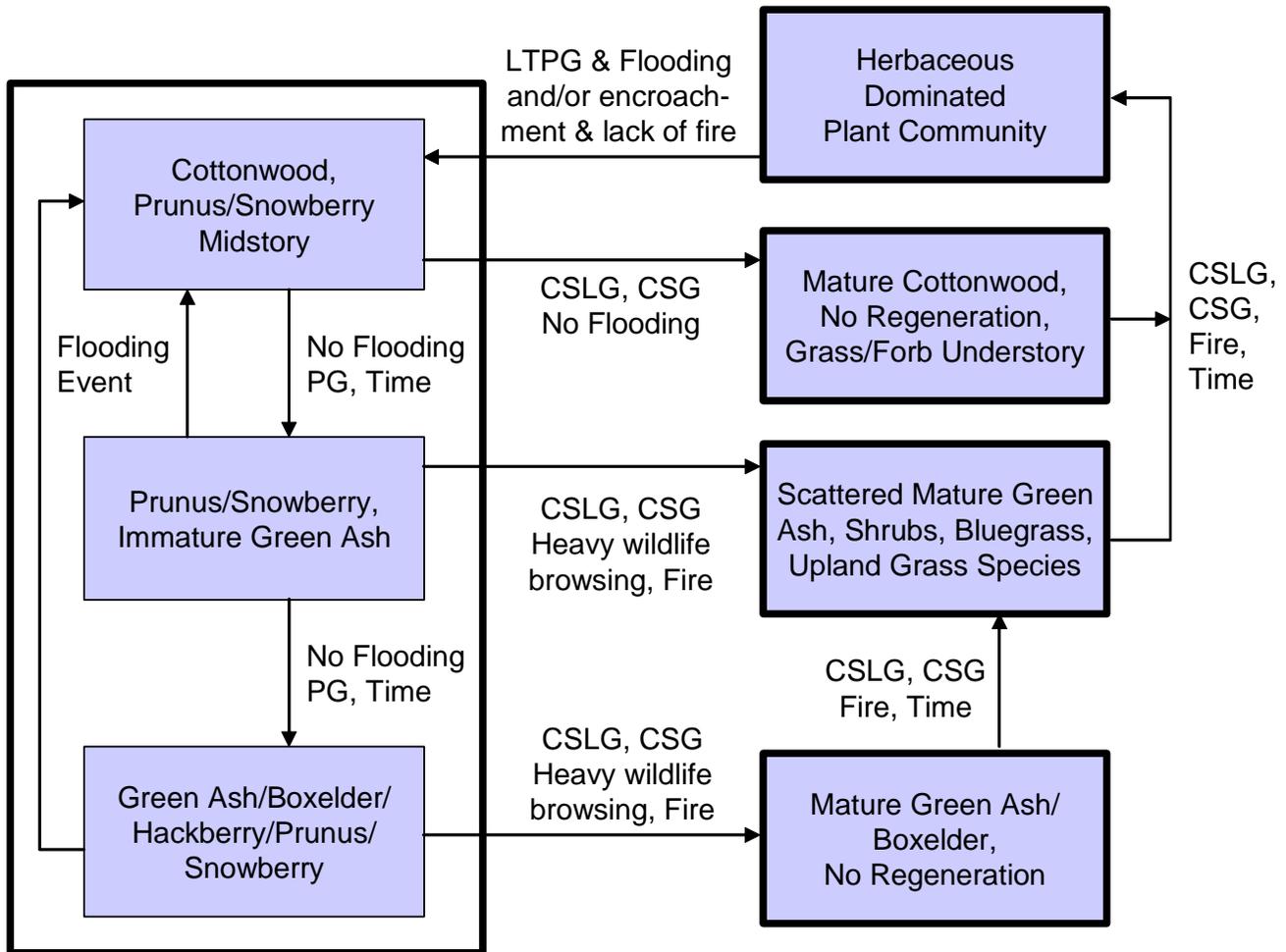
- Long-term prescribed grazing with adequate recovery periods following each grazing event and proper stocking over long periods of time may move this plant community toward the *Western Wheatgrass/Kentucky Bluegrass, Remnant Big Bluestem Plant Community* and will eventually return to the *Big Bluestem/Western Wheatgrass Plant Community* or associated successional plant community stages assuming an adequate seed/vegetative source is available. Managed high stock densities and stocking rates during the early growing season may be necessary to affect this change.

Tree Overstory

Woody shrubs, and especially trees can establish and/or encroach on this site. The succession will take different paths depending on where on the drainage this occurs. For lower reaches of the drainage, refer to the Lower Woody Draw descriptions. For upper reaches of the drainage, refer to the Upper Woody Draw descriptions.

Lower Woody Draw

The following diagram depicts the successional changes that can occur on lower reaches of the drainage when trees encroach onto the site. Following the diagram are descriptions of each of the plant communities in the diagram.



Cottonwood, Prunus/Snowberry Midstory Plant Community – This plant community typically occurs after a flooding event, and with prescribed grazing. Flooding reduces herbaceous competition through scouring of the soil surface, and provides a site for establishment and regeneration to occur. Prescribed grazing is necessary for this plant community to establish in order to prevent grazing of sapling cottonwood trees. Trees will be from seedling to immature stages, and the herbaceous understory will still be productive as a result of the filtered canopy of the deciduous trees. Understory shrubs, primarily plum and/or chokecherry, and snowberry will be most likely to establish. However, other species, including silver buffaloberry and currants can establish and dominate the shrub layer.

Prunus/Snowberry, Immature Green Ash Plant Community – If the cottonwood trees remain intact, and green ash establishes on the site, prescribed grazing will allow this plant community to develop. The cottonwood trees and woody shrubs provide a suitable microclimate for establishment of other deciduous trees such as green ash. Green ash is typically the first tree to establish, but other species such as boxelder and hackberry will often become established as well. Cottonwood trees will be from the immature to young mature stage, and green ash will be from the sapling to immature stages. The herbaceous plant community will remain relatively productive, but will be reduced somewhat from the Big Bluestem/Western Wheatgrass Plant Community. This is due mainly to the competition from the woody shrub understory.

Green Ash/Boxelder/Hackberry/Prunus/Snowberry Plant Community – This plant community develops over time, with prescribed grazing and no flooding. Cottonwood trees will likely remain in lesser numbers, but the dominant trees will normally be green ash, boxelder and/or hackberry. At times there will be a mix of all three species. However, some areas will be dominated by one or two of these species. Woody shrubs will remain in the understory, but typically in lesser amounts than in the previous two plant communities. While somewhat reduced, the herbaceous understory will remain relatively productive. The trees will mostly be in the mature stage, but regeneration will normally be evident (i.e., seedlings and saplings should be present).

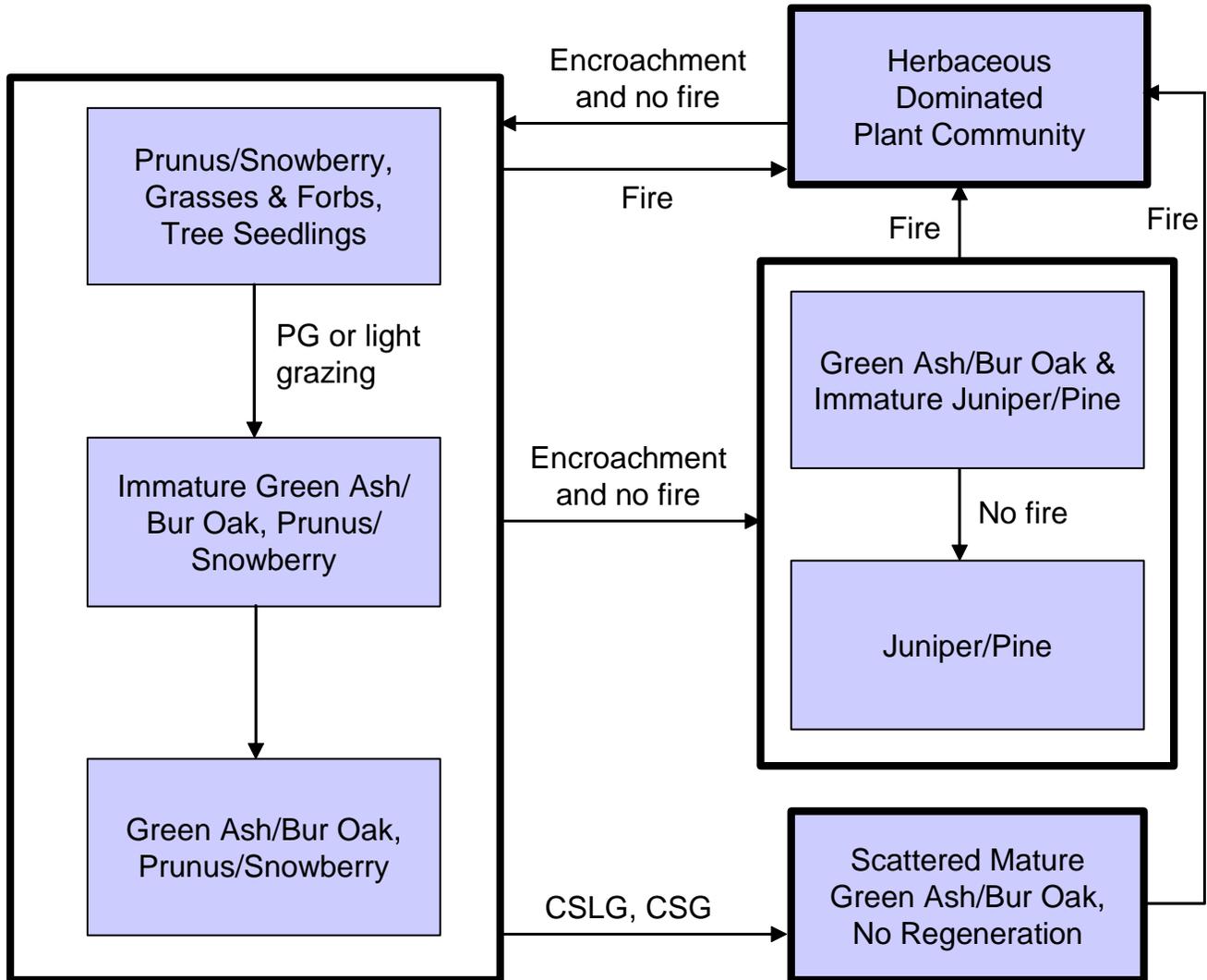
Mature Cottonwood, No Regeneration, Grass/Forb Understory Plant Community – This plant community is typically derived from the Cottonwood, Prunus/Snowberry Midstory Plant Community as a result of continuous season-long grazing or continuous seasonal grazing and no flooding. With time, the cottonwood trees that survive become mature, and little or no regeneration occurs due mainly to grazing of seedlings & saplings. The type of grazing that limits regeneration also results in a reduction of the desirable native herbaceous species, often resulting in a dominance of species such as bluegrass and/or smooth brome grass, and forbs such as American licorice, aster, cudweed sagewort, goldenrod and western ragweed. Introduced forbs such as Canada thistle, burdock, curly dock and others will likely invade the site.

Scattered Mature Green Ash, Shrubs, Bluegrass, Upland Grass Species Plant Community – This plant community is derived from the Prunus/Snowberry Immature Green Ash Plant Community or the Mature Green Ash/Boxelder, No Regeneration Plant Community as a result of continuous season-long grazing or continuous seasonal grazing and no flooding, or heavy wildlife browsing and no flooding. Fire may also be a factor in this transition. With time, the green ash trees that survive become mature, and little or no regeneration occurs due mainly to grazing of seedlings & saplings. The type of grazing that limits regeneration also results in a reduction of the desirable native herbaceous species, often resulting in a dominance of species such as bluegrass and/or smooth brome grass, and forbs such as American licorice, aster, cudweed sagewort, goldenrod and western ragweed. Introduced forbs such as Canada thistle, burdock, curly dock and others will likely invade the site. The trees are scattered, and the site may have a “park-like” appearance with few trees and reduced understory.

Mature Green Ash/Boxelder, No Regeneration Plant Community – This plant community is typically derived from the Green Ash/Boxelder/Hackberry/Prunus/Snowberry Plant Community as a result of continuous season-long grazing or continuous seasonal grazing and no flooding, or heavy wildlife browsing and no flooding. Fire may also be a factor in this transition. With time, the trees that survive become mature, and little or no regeneration occurs due mainly to grazing of seedlings & saplings. The type of grazing that limits regeneration also results in a reduction of the desirable native herbaceous species, often resulting in a dominance of species such as bluegrass and/or smooth brome grass, and forbs such as American licorice, aster, cudweed sagewort, goldenrod and western ragweed. Introduced forbs such as Canada thistle, burdock, curly dock and others will likely invade the site.

Upper Woody Draw

The following diagram depicts the successional changes that can occur on upper reaches of the drainage when trees encroach onto the site. Following the diagram are descriptions of each of the plant communities in the diagram.



Prunus/Snowberry, Grasses & Forbs, Tree Seedlings Plant Community – This plant community typically occurs when woody shrubs and trees from adjacent sites encroach, and with a lack of fire. The woody shrubs provide a suitable microclimate for the establishment of trees. Trees will be from seedling to immature stages, and the herbaceous understory will still be productive as a result of the filtered canopy of the deciduous trees. The vegetation will consist of more woody shrubs than in the Big Bluestem/Western Wheatgrass Plant Community, and the herbaceous component will be reduced slightly. Understory shrubs, primarily plum and/or chokecherry, and snowberry will be most likely to establish. However, other species, including silver buffaloberry and currants can establish and dominate the shrub layer.

Immature Green Ash/Bur Oak, Prunus/Snowberry Plant Community – With time and prescribed grazing or light grazing that allows for survival of the young trees, this plant community will develop from the Prunus/Snowberry, Grasses & Forbs, Tree Seedlings Plant Community. On the eastern portions of the MLRA, bur oak will tend to be the likely tree to establish; whereas, on the western portions of the MLRA, green ash will be more prevalent. Green ash and/or bur oak trees will be from the immature to young mature stage, and seedling and saplings will still be present in the understory. The herbaceous plant community will remain relatively productive, but will be reduced somewhat from the Big Bluestem/Western Wheatgrass Plant Community. This is due mainly to the competition from the woody shrub understory.

Green Ash/Bur Oak, Prunus/Snowberry Plant Community – A relatively full canopy of green ash, bur oak, or a combination of the two, dominates this plant community. It develops over time from the Immature Green Ash/Bur Oak, Prunus/Snowberry Plant Community, with prescribed grazing or light grazing that allows for survival of the young trees, and a healthy, productive herbaceous/shrub understory. Woody shrubs will remain in the understory, but typically in lesser amounts than in the previous two plant communities. While somewhat reduced, the herbaceous understory will remain relatively productive. The trees will mostly be in the mature stage, but regeneration will normally be evident (i.e., seedlings and saplings should be present).

Scattered Mature Green Ash/Bur Oak, No Regeneration Plant Community – This plant community is typically derived from the Immature Green Ash/Bur Oak, Prunus/Snowberry Plant Community or the Green Ash/Bur Oak, Prunus/Snowberry Plant Community as a result of continuous season-long grazing or continuous seasonal grazing. With time, the trees that survive become mature, and little or no regeneration occurs due mainly to grazing of seedlings & saplings. When this plant community comes from the more mature stages, the canopy becomes scattered as a result of tree loss by disease or old age. The type of grazing that limits regeneration also results in a reduction of the desirable native herbaceous species, often resulting in a dominance of species such as bluegrass and/or smooth brome grass, and forbs such as aster, cudweed sagewort, goldenrod and western ragweed. The trees are scattered, and the site may have a “park-like” appearance with few trees and reduced understory. With fire, this plant community may return to an herbaceous dominated plant community. Bur oak does sprout with fire, but the dominance of the herbaceous understory may result in few or no bur oak trees remaining on the site after fire.

Green Ash/Bur Oak & Immature Juniper/Pine – The next two plant communities can occur whenever this site is near a seed source for juniper and/or pine. This plant community typically develops after some amount of deciduous canopy exists, which provides a suitable microclimate for the establishment of the shade tolerant juniper and/or pine. If no fire occurs, the juniper and/or pine will continue to increase in size, and in the process, change the microclimate (soil moisture) so that it becomes less suitable for the deciduous trees. This plant community is the beginning stage of this transformation, and typically will have numerous immature juniper and/or pine under the deciduous tree canopy. The herbaceous/shrub understory will begin to decline rapidly.

Juniper/Pine Plant Community – This plant community develops over time, and with a lack of fire from the Green Ash/Bur Oak & Immature Juniper/Pine Plant Community. As the juniper and/or pine continue to gain stature and overtop the green ash and/or bur oak, they also tap much of the available soil moisture and make the site essentially inhabitable to the deciduous trees. Juniper and/or pine will dominate the vegetation, and eventually form a nearly closed canopy. The understory vegetation will be the most suppressed of all the woody dominated plant communities. Fire on this or the previous plant community will result in an herbaceous plant community. However, if this plant community persists long enough, the resultant herbaceous community may consist mostly of pioneer species with a likelihood of an abundance of cheatgrass.

Ecological Site Interpretations Animal Community – Wildlife Interpretations

-- Under Development --

Big Bluestem/Western Wheatgrass Plant Community:

Western Wheatgrass/Kentucky Bluegrass, Remnant Big Bluestem Plant Community:

Excessive Litter Plant Community:

Kentucky Bluegrass, Annuals Plant Community:

Lower Woody Draw:

Upper Woody Draw:

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

Common Name	Cattle	Sheep	Horses	Deer	Antelope	Bison	Elk
Grasses & Grass-likes							
big bluestem	U D P D	U D U U	U D P D	U D U U	U D U U	U D P D	U D P D
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
Canada wildrye	U D U U	N U N N	U D U U	N U N N	N U N N	U D U U	U D U U
cheatgrass	U D U U	N P U N	U D U U	N P U N	N P U N	U D U U	U D U U
green muhly	U D D U	N U N N	U D D U	N U N N	N U N N	U D D U	U D D U
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
Kentucky bluegrass	U D U U	U P N D	U D U U	U P N D	U P N D	U D U U	U D U U
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 cordgrass	U D D U	N N N N	U D D U	N N N N	N N N N	U D D U	U D D U
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
sand 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
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
sideoats grama	U D P U	U P D U	U D P U	U P D U	U P D U	U D P U	U D P U
slender wheatgrass	U P U U	N D U N	U P U U	N D U N	N D U N	U P U U	U P U U
smooth brome	U P U U	U P U U	U P U U	U P U U	U P U U	U P U U	U P U U
switchgrass	U D D U	U D U U	U D D U	N N N N	N N N N	U D D U	U D D U
tall 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
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							
American licorice	U U D U	N U U N	U U D U	N U U N	N U U N	U U D U	N U U N
American vetch	U D P U	U P P U	U D P U	U P P U	U P P U	U D P U	U P P U
aster	U U D U	U U D U	U U D U	U U D U	U U D U	U U D U	U U D U
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
false boneset	U U D U	N D U N	U U D U	N D U N	N D U N	U U D U	N D U N
false Solomon's-seal	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
giant ragweed	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
goldenrod	U U D U	N U U N	U U D U	N U U N	N U U N	U U D U	N U U N
nettle	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
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
scarlet gaura	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
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
verbena	U U D U	U U U U	U U D U	U U U U	U U U U	U U D U	U U U U
western ragweed	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
Shrubs							
American plum	D U U D	D U U D	D U U D	P U D D	D U U D	D U U D	D U U D
chokecherry	D T T D	D T T D	D T T D	P U D P	D U U D	D T T D	P U U P
golden currant	U D D U	U P P D	U D D U	U P P D	U U U U	U D D U	U P P D
leadplant	U P D U	U P D U	U P D U	U P D U	U P D U	U P D U	U P D U
rose	U D D U	U D D U	U D D U	U D D U	U D D U	U D D U	U D D U
silver buffaloberry	D U U U	D U U U	D U U U	P U D P	U U U U	D U U U	D U U U
western snowberry	U U U U	U U U U	U U U U	D U D D	U U U U	U U U U	D U U U
Trees							
American elm	N N N N	N N N N	N N N N	N U D N	N N N N	N N N N	N N N N
boxelder	N N N U	N N U U	N N N U	N N U U	N N U U	N N N U	N N U U
bur oak	T T T T	T T T T	N N N N	N U D U	N N N N	T T T T	N U D U
green ash	N U D U	N D D U	N U D U	N D D U	N U D U	N U D U	N D D U
hackberry	N U D U	N D D U	N U D U	N D D U	N U D U	N U D U	N D D U
hawthorn	N U U U	N D D U	N U U U	N D D U	N U D U	N U U U	N D D U
plains cottonwood	D U U D	D U U D	D U U D	D U D D	D U U D	D U U D	D U U D

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 ecological site 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)
Big Bluestem/Western Wheatgrass	3000	0.90
Western Wheatgrass/Kentucky Bluegrass, Remnant Big Bluestem	2300	0.73
Excessive Litter	1600	0.51
Kentucky Bluegrass, Annuals	1000	0.32

* Based on 790 lbs./acre (air-dry weight) per Animal Unit Month (AUM), and on 25% 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 forage production on this site. This site is dominated by soils in hydrologic group B, with localized areas in hydrologic group C. Infiltration rate is moderately to slow. 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% ground cover have the greatest potential for high infiltration and lower runoff. An example of an exception would be where rhizomatous grasses form a strong sod and dominate the site. Areas where ground cover is less than 50% 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, hiking, photography, bird watching and other opportunities. The wide varieties of plants that bloom from spring until fall have an esthetic value that appeals to visitors.

Wood Products

Local or individual fire wood can be utilized from this site.

Other Products

None noted.

Supporting Information

Associated Sites

(064XY015NE) – Loamy 14-17" P.Z.

(064XY037NE) – Thin Upland

(064XY036NE) – Loamy 17-20" P.Z.

Similar Sites

(064XY027NE) – Clayey Overflow [less bluestems; more western wheatgrass]

Inventory Data References

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

<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 Nebraska, South Dakota and Wyoming 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 68583-0728. (<http://hpccsun.unl.edu>)

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

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

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

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

USDA, NRCS, Various Published Soil Surveys.

Site Description Approval

NE, State Range Management Specialist Date _____
SD, State Range Management Specialist Date

WY, State Range Management Specialist Date