

# United States Department of Agriculture Natural Resources Conservation Service

## Ecological Site Description

**Site Type:** Rangeland

**Site Name:** Clayey (Cy) 15-19” Northern Plains Precipitation Zone,

**Site ID:** 043BY404WY

**Major Land Resource Area:** 43B – Central Rocky Mountains

### Physiographic Features

This site occurs on nearly level to 30% slopes.

**Landform:** Hill sides, alluvial fans, ridges & stream terraces

**Aspect:** N/A

	<u>Minimum</u>	<u>Maximum</u>
<b>Elevation (feet):</b>	3700	7500
<b>Slope (percent):</b>	0	30
<b>Water Table Depth (inches):</b>	None within 60 inches	
<b>Flooding:</b>		
<b>Frequency:</b>	None	None
<b>Duration:</b>	None	None
<b>Ponding:</b>		
<b>Depth (inches):</b>	0	0
<b>Frequency:</b>	None	None
<b>Duration:</b>	None	None
<b>Runoff Class:</b>	very low	very high

### Climatic features

Annual precipitation ranges from 15" to 19" per year. May is generally the wettest month. July, August and September are somewhat drier with daily amounts rarely exceeding one inch. Snowfall is quite heavy in the mountainous area. Annual snowfall averages close to 70 inches.

Sunshine is abundant in the latter part of the summer, the greatest amount being in July and August. Sunshine possibility during these two months averages 70 to 75% possibility with only a 65% possibility for June and September. Winter averages about 40% sunshine.

Because of the varied topography, the wind will vary considerably for different parts of the area. The wind is usually much lighter at the lower elevations and in the valleys as compared with the higher terrain. The average winter wind velocity is 8.5 mph, while the summer wind velocity averages 7.5 mph. Winds during storms and on ridges may exceed 45 mph.

Temperatures show a wide range between summer and winter, and between daily maximums and minimums. Summer nights are cool and temperatures drop into the forties at most places before sunrise. Summer daytime temperatures are usually in the seventies and occasionally reach eighty, but rarely reach the mid nineties. Winters are cold with daily lows below freezing most of the time. January

has the coldest temperatures with a range of near 10 deg. F at night to the mid thirties in the afternoon. Temperatures of well below zero to –30 deg. F are not uncommon in the winter months.

The growing season for the cool season plants will generally start about April 15 to May 1 and continue to about October 10.

The following information is from the “Sheridan Airport” climate station:

Frost-free period (32 °F): 95-156 days; (5 yrs. out of 10, these days will occur between May 21 – September 19)

Freeze-free period 28 °F): 116-187 days; (5 yrs. out of 10, these days will occur between May 4 – September 29)

Mean annual precipitation: 14.7 inches

Mean annual air temperature: 45.0 °F (31.2 °F Avg. Min. – 58.8 °F Avg. Max.)

For detailed information visit the Natural Resources Conservation Service National Water and Climate Center at <http://www.wcc.nrcs.usda.gov/> website. Other climate station(s) representative of this precipitation zone include: “Parkman 5 WNW”

## Influencing Water Features

Wetland Description:	<u>System</u>	<u>Subsystem</u>	<u>Class</u>	<u>Sub-class</u>
None	None	None	None	None

Stream Type: None

## Representative Soil Features

The soils of this site are deep (greater than 20”to bedrock), well-drained, moderately to slowly permeable and usually occur on slopes less than 10%. The topsoil must be at least 2-5 inches deep and one of the following textures: silty clay, the finer portions of sandy clay loam, silty clay loam and clays which do not develop severe cracks or become extremely hard when dry and very sticky when wet.

**Parent Material Kind:** alluvium and residuum

**Parent Material Origin:** shale, calcareous

**Surface Texture:** clay loam, silty clay loam, clays, silty clay

**Surface Texture Modifier:** none is most common but gravelly or cobbly may occur

**Subsurface Texture Group:** clay

**Surface Fragments ≤ 3” (% Cover):** 0

**Surface Fragments > 3” (%Cover):** typically 0, occasionally up to 10

**Subsurface Fragments ≤ 3” (% Volume):** typically 0, occasionally up to 15

**Subsurface Fragments > 3” (% Volume):** typically 0, occasionally up to 10

	<u>Minimum</u>	<u>Maximum</u>
<b>Drainage Class:</b>	moderately well drained	well drained
<b>Permeability Class:</b>	slow	moderately slow
<b>Depth (inches):</b>	20	>60
<b>Electrical Conductivity (mmhos/cm) ≤20”:</b>	0	4
<b>Sodium Absorption Ratio ≤20”:</b>	0	5
<b>Soil Reaction (1:1 Water) ≤20”:</b>	6.6	8.4
<b>Soil Reaction (0.1M CaCl2) ≤20”:</b>	NA	NA
<b>Available Water Capacity (inches) ≤30”:</b>	2.8	5.7
<b>Calcium Carbonate Equivalent (percent) ≤20”:</b>	0	5

## Plant Communities

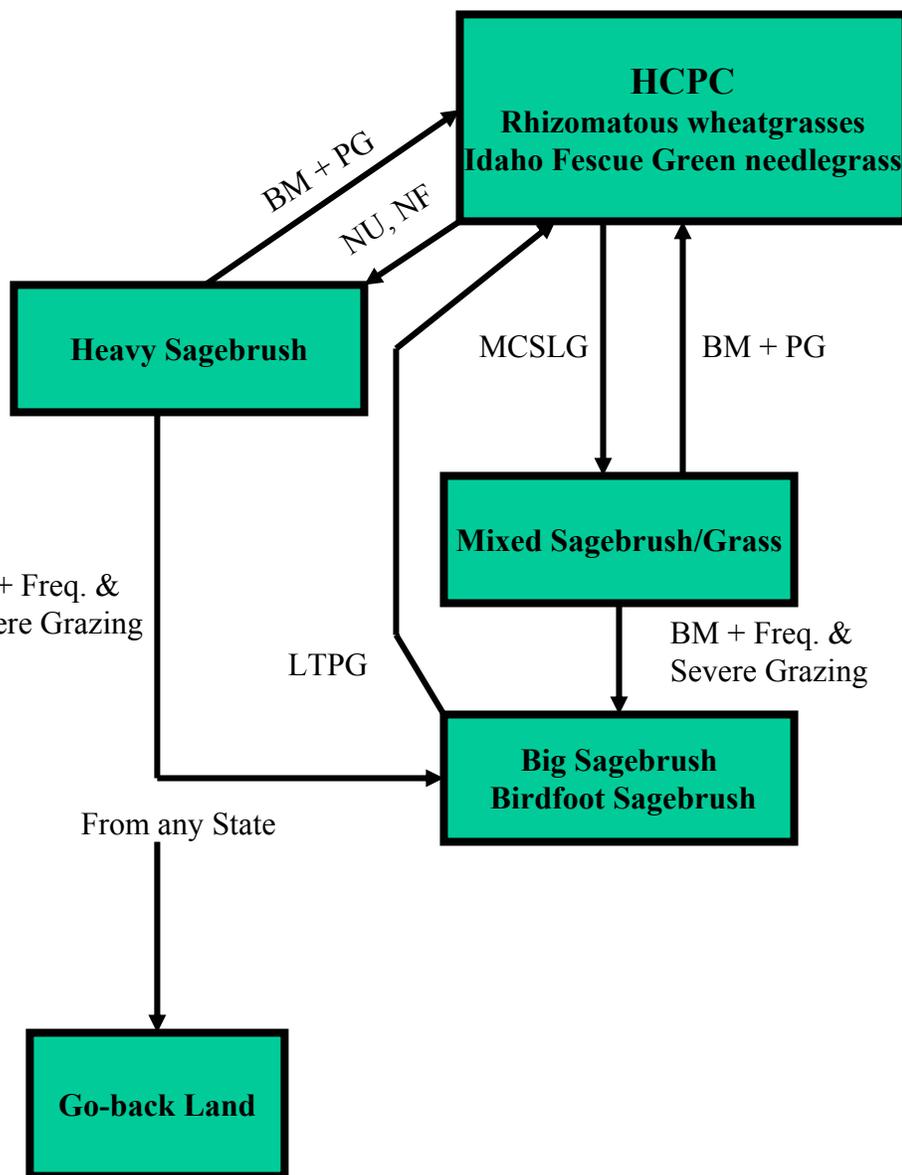
### Ecological Dynamics of the Site:

As this site deteriorates from improper grazing management, species such as blue grama, birdfoot sagebrush and big sagebrush will increase. Species such as cheatgrass will invade. Cool season grasses such as green needlegrass and western wheatgrass will decrease in frequency and production.

Big sagebrush may become dominant on some areas with an absence of fire. Wildfires are actively controlled in recent times so chemical control using herbicides has replaced the historic role of fire on this site. Recently, prescribed burning has regained some popularity.

The Historic Climax Plant Community (description follows the plant community diagram) has been determined by study of rangeland relic areas, or areas protected from excessive disturbance. Trends in plant communities going from heavily grazed areas to lightly grazed areas, seasonal use pastures, and historical accounts have also been used.

The following is a State and Transition Model Diagram that illustrates the common plant communities (states) that can occur on the site and the transitions between these communities. The ecological processes will be discussed in more detail in the plant community narratives following the diagram.



- BM** - Brush Management (fire, chemical, mechanical)
- Freq. & Severe Grazing** - Frequent and Severe Utilization of the Cool-season Mid-grasses during the Growing Season
- GLMT** - Grazing Land Mechanical Treatment
- LTPG** - Long-term Prescribed Grazing
- MCSLG** - Moderate, Continuous Season-long Grazing
- NU, NF** - No Use and No Fire
- PG** - Prescribed Grazing (proper stocking rates with adequate recovery periods during the growing season)
- VLTPG** - Very Long-term Prescribed Grazing (could possibly take generations)
- Na** - Moderate Sodium in Soil

**Plant Community Composition and Group Annual Production  
Reference Plant Community (HCPC)**

COMMON NAME/GROUP NAME	SCIENTIFIC NAME	SYMBOL	Annual Production (Normal Year)		
			Group	lbs./acre	% Comp.
			Total: 2100		
<b>GRASSES AND GRASS-LIKES</b>					
<b>GRASSES/GRASSLIKES</b>					
Green needlegrass	Nassella viridula	NAV14	1	420 - 840	20 - 40
<b>Rhizomatous wheatgrasses</b>			<b>2</b>	<b>210 - 420</b>	<b>10 - 20</b>
thickspike wheatgrass	Elymus lanceolatus	ELLAL	2	210 - 420	10 - 20
western wheatgrass	Pascopyrum smithii	PASM	2	210 - 420	10 - 20
Idaho fescue	Festuca idahoensis	FEID	3	105 - 210	5 - 10
Sideoats grama	Bouteloua curtipendula	BOCU	4	105 - 210	5 - 10
Plains reedgrass	Calamagrostis montanensis	CAMO	5	105 - 210	5 - 10
Cusick bluegrass	Poa cusickii	POCU3	6	105 - 210	5 - 10
Spike fescue	Leucopoa kingii	LEKI2	7	105 - 210	5 - 10
<b>MISC. GRASSES/GRASSLIKES</b>			<b>8</b>	<b>105 - 420</b>	<b>5 - 20</b>
Bearded wheatgrass	Elymus caninus	ELCA11	8	0 - 105	0 - 5
Big bluegrass	Poa ampla (syn. P. secunda)	POAM	8	0 - 105	0 - 5
Blue grama	Bouteloua gracilis	BOGR2	8	0 - 105	0 - 5
Blue wildrye	Elymus glaucus	ELGL	8	0 - 105	0 - 5
Bottlebrush squirreltail	Elymus elymoides	ELEL5	8	0 - 105	0 - 5
Canby bluegrass	Poa canbyi (syn. P. secunda)	POCA (POSE)	8	0 - 105	0 - 5
Fowl bluegrass	Poa palustris	POPA2	8	0 - 105	0 - 5
Indian ricegrass	Achnatherum hymenoides	ACHY	8	0 - 105	0 - 5
Letterman needlegrass	Achnatherum lettermanii	ACLE9	8	0 - 105	0 - 5
Mountain brome	Bromus marginatus	BRMA4	8	0 - 105	0 - 5
Nodding brome	Bromus anomalus	BRAN	8	0 - 105	0 - 5
Onespike oatgrass	Danthonia unispicata	DAUN	8	0 - 105	0 - 5
Prairie junegrass	Koeleria macrantha	KOMA	8	0 - 105	0 - 5
Pumpelly brome	Bromus inermis spp. pumpellianus	BRINP5	8	0 - 105	0 - 5
Richardson needlegrass	Achnatherum richardsonii	ACRI8	8	0 - 105	0 - 5
Sandberg bluegrass	Poa secunda	POSE	8	0 - 105	0 - 5
Slender wheatgrass	Elymus trachycaulus	ELTR7	8	0 - 105	0 - 5
Spike trisetum	Trisetum spicatum	TRSP2	8	0 - 105	0 - 5
Threadleaf sedge	Carex filifolia	CAFI	8	0 - 105	0 - 5
other perennial grasses (native)		2GP	8	0 - 105	0 - 5
<b>FORBS</b>			<b>9</b>	<b>105 - 315</b>	<b>5 - 15</b>
American vetch	Vicia americana	VIAM	9	0 - 105	0 - 5
Aster	Eucephalus spp.	EUCEP2	9	0 - 105	0 - 5
Biscuitroot	Lomatium spp.	LOMAT	9	0 - 105	0 - 5
Bluebells	Mertensia spp.	MERTE	9	0 - 105	0 - 5
Buckwheat	Eriogonum spp.	ERIOG	9	0 - 105	0 - 5
Field chickweed	Cerastium arvense	CEAR4	9	0 - 105	0 - 5
Flax	Linum spp.	LINUM	9	0 - 105	0 - 5
Fringed sagewort	Artemisia frigida	ARFR4	9	0 - 105	0 - 5
Hairy goldenaster	Heterotheca villosa	HEVI2	9	0 - 105	0 - 5
Lupine	Lupinus spp.	LUPIN	9	0 - 105	0 - 5
Phlox	Phlox spp.	PHLOX	9	0 - 105	0 - 5
Prairie clovers	Dalea spp.	DALEA	9	0 - 105	0 - 5
Prairie coneflower	Ratibida columnifera	RACO3	9	0 - 105	0 - 5
Pussytoes	Antennaria rosea	ANRO2	9	0 - 105	0 - 5
Silverleaf scurfpea	Pediomelum argophyllum	PEAR6	9	0 - 105	0 - 5
yarrows	Achillea spp.	ACHIL	9	0 - 105	0 - 5
other perennial forbs (native)		2FP	9	0 - 105	0 - 5
<b>TREES/SHRUBS</b>					
Big sagebrush	Artemisia tridentata	ARTR2	10	0 - 105	0 - 5
winterfat	Krascheninnikovia lanata	KRLA2	11	0 - 105	0 - 5
Rubber rabbitbrush	Ericameria nauseosa	ERNA10	12	0 - 105	0 - 5
other shrubs & half shrubs (native)		2SHRUB	13	0 - 105	0 - 5

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.

**Plant Community Narratives**

Following are the narratives for each of the described plant communities. These plant communities may not represent every possibility, but they probably 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”. 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.

**Rhizomatous Wheatgrasses, Idaho Fescue, Green Needlegrass Community**

The interpretive plant community for this site is the Historic Climax Plant Community. This state evolved with grazing by large herbivores and is well suited for grazing by domestic livestock. Potential vegetation is about 75% grasses or grass-like plants, 15% forbs, and 10% woody plants. The state is dominated by cool season midgrasses. The major grasses include rhizomatous wheatgrass, Idaho fescue and green needlegrass. Other grasses occurring on the state include side oats grama, spike fescue, Cusick and Sandberg bluegrass, threadleaf sedge, blue grama, and plains reedgrass. Big sagebrush is a conspicuous element of this state, occurs in a mosaic pattern, and makes up 5 to 10% of the annual production. Big sagebrush may become dominant on some areas with absence of fire. Natural fire occurred frequently in this community and prevented sagebrush from being the dominant landscape. Wildfires are actively controlled in recent times so chemical control using herbicides has replaced the historic role of fire on this site. Recently controlled burning has regained some popularity.

This state produces between 1400 and 2900 pounds annually, depending on the growing conditions.

The following is the growth curve of this plant community expected during a normal year:

Growth curve number:

Growth curve name:

Growth curve description:

JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
0	0	0	10	30	35	10	5	5	5	0	0

(Monthly percentages of total annual growth)

This plant community is extremely stable and well adapted to the Northern Great Plains climatic conditions. The diversity in plant species allows for high drought tolerance. This is a sustainable plant community (site/soil stability, watershed function, and biologic integrity).

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

- Protection from grazing and fire, will convert this plant community to the *Heavy Sagebrush Vegetation State*.
- Moderate, continuous season-long grazing will convert the plant community to the *Mixed Sagebrush/Grass Vegetation State*.
- Long-term, heavy, continuous season-long grazing will convert the plant community to the *Big sagebrush/Birdfoot sage Vegetation State*.

- When cropped annually and then abandoned without reseeding, the state is converted to the *Go-back Land Vegetation State*.

**Mixed Sagebrush/Grass Plant Community**

Historically, this plant community evolved under grazing by bison and a low fire frequency. Currently, it is found under moderate, season-long grazing by livestock in the absence of fire or brush control. Big sagebrush is a significant component of this plant community. Cool-season grasses make up the majority of the understory with the balance made up of short warm-season grasses, annual cool-season grass, and miscellaneous forbs.

Dominant grasses include rhizomatous wheatgrass, and green needlegrass. Grasses of secondary importance include blue grama, prairie junegrass, and Sandberg bluegrass. Forbs, commonly found in this plant community, include Louisiana sagewort (cudweed), plains wallflower, hairy goldaster, slimflower scurfpea, and scarlet globemallow. Sagebrush canopy ranges from 20% to 30%. Fringed sagewort is commonly found. Plains pricklypear can also occur.

This state produces between 900 and 2400 pounds annually, depending on the growing conditions.

When compared to the Historical Climax Plant Community, sagebrush and blue grama have increased. Green needlegrass has decreased, often occurring only where protected from grazing by the sagebrush canopy. Production of cool-season grasses has also been reduced. Cheatgrass (downy brome) has invaded the site. The overstory of sagebrush and understory of grass and forbs provide a diverse plant community which will support domestic livestock and wildlife such as mule deer and antelope.

The state is stable and protected from excessive erosion. The biotic integrity of this plant community is usually intact. However, it can be at risk depending on how far a shift has occurred in plant composition toward blue grama, sagebrush, and/or cheatgrass. The watershed is usually functioning. However, it can become at risk when canopy cover of sagebrush, blue grama sod, and/or bare ground increases. A significant reduction of big sagebrush can only be accomplished through fire or brush management. The herbaceous species present are well adapted to grazing; however, species composition can be altered through long-term overgrazing. If the herbaceous component is intact, it tends to be resilient if the disturbance is not long-term.

The following is the growth curve of this plant community expected during a normal year:

Growth curve number:

Growth curve name:

Growth curve description:

JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
0	0	0	10	30	35	10	5	5	5	0	0

(Monthly percentages of total annual growth)

This plant community is resistant to change

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

- Brush control followed by prescribed grazing, will result in a plant community very similar to the *Historic Climax Plant Community*.
- Brush management followed by heavy, continuous season-long grazing, will result in a *Big Sagebrush, Birdfoot sage Vegetation State*

**Heavy Sagebrush Plant Community**

This plant community is the result of protection from grazing and fire. Sagebrush dominates this plant community with canopy cover often exceeding 60%. The understory of grass includes rhizomatous wheatgrass, green needlegrass, sideoats grama, Sandberg bluegrass, and prairie junegrass. With complete protection from grazing and fire, the site will become dominated by big sagebrush. The cool season grasses are protected by the sagebrush canopy, but this protection makes them unavailable for grazing. Big sagebrush is long-lived and will persist for a long period. A significant reduction of big sagebrush can only be accomplished through fire or brush management.

Annual production ranges from 900 to 2000 pounds depending on climatic conditions.

The following is the growth curve of the plant community expected during a normal year:

Growth curve number:

Growth curve name:

Growth curve description:

JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
0	0	0	10	30	35	10	5	5	5	0	0

(Monthly percentages of total annual growth)

This plant community is not resistant to change and is more vulnerable to severe disturbance than the HCPC. The introduction of grazing or fire quickly changes the plant community. Soil erosion is accelerated because of increased bare ground. Water flow patterns and pedestaling are obvious. Infiltration is reduced and runoff is increased.

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

- Brush control followed by deferment for 1 to 2 years and prescribed grazing thereafter will return this state to near *Historical Climax Plant Community*. Care should be taken when planning brush control to exclude critical winter ranges.
- Heavy, continuous, season-long grazing will convert this state to *Big sagebrush, Birdfoot sage Vegetation State*.

**Big sagebrush, Birdfoot sage Plant Community**

This plant community is the result of long-term, heavy, continuous season-long grazing. It is dominated by big sagebrush, birdfoot sage, rhizomatous wheatgrass, Sandberg bluegrass and cheatgrass.

When compared to the historic climax plant community there are hardly any perennial grasses left and the dominant shrubs are big sagebrush and birdfoot sage. Much bare ground is present. Plains prickly pear has increased. This community has lost some of its value for grazing wildlife and livestock. It is susceptible to erosion and increased runoff due to the bare ground.

The total annual production ranges from 600 to 1400 pounds

The following is the growth curve of the plant community expected during a normal year:

Growth curve number:

Growth curve name:

Growth curve description:

JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
0	0	0	10	30	35	10	5	5	5	0	0

(Monthly percentages of total annual growth)

This plant community is relatively stable with the rhizomatous wheatgrasses being somewhat resistant to overgrazing and the cheatgrass effectively competing against the establishment of perennial cool-season grasses.

An increase in bare ground reduces water infiltration and increases soil erosion. The watershed is usually functioning. The biotic integrity is reduced by the lack of diversity in the plant community.

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

- Long-term prescribed grazing may improve this state, but it may be difficult to return to the *Historic Climax Plant Community*.

### Go-back Land Plant Community

This plant community occurs on land that has been cropped annually in the past and then abandoned without reseeding. Natural succession has resulted in a plant community dominated by varying combinations of red threeawn, cheatgrass, blue grama, Sandberg bluegrass, and rhizomatous wheatgrass. Forage production is low since grasses such as red threeawn and cheatgrass are not used efficiently by livestock.

Annual production ranges from 800-1200 pounds.

The following is the growth curve of this plant community expected during a normal year:

Growth curve number:

Growth curve name:

Growth curve description:

JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
0	0	0	0	0	0	0	0	0	0	0	0

(Monthly percentages of total annual growth)

The potential for accelerated erosion can be highly variable depending on amount of bare ground present. Biological diversity is low.

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

- Prescribed grazing may increase desirable native cool season grass production. It may be difficult to return to near *Historic Climax Plant Community* condition, in a timely manner, because of past soil loss.
- Mechanical range renovation (i.e., chiseling) may improve forage production where significant rhizomatous wheatgrass is present to respond to the treatment.
- Where there is a lack of perennial grass, reseeding to tame or native species may be necessary to return these lands to production in the form of pastureland.

### Introduced Pasture

Where there is a lack of perennial grasses, reseeding to tame or native species may be necessary to return these lands to production in the form of pastureland. These pastures are normally seeded to crested wheatgrass, pubescent wheatgrass, or Russian wildrye. They require considerable investment to establish and have a variable life expectancy. They do produce up to 50% more than native range, but their value as forage is somewhat limited due to the single species usually seeded. In some cases, the single species or certain groups of species (e.g., wheatgrasses) may be more vulnerable to infestation by associated insects and/or diseases (e.g., black grass bugs).

## Ecological Site Interpretations

### Animal Community – Wildlife Interpretations

**Rhizomatous Wheatgrasses, Idaho Fescue, Green Needlegrass (HCPC):** The predominance of grasses in this plant community favors grazers and mixed-feeders, such as bison, elk, and antelope. Suitable thermal and escape cover for deer may be limited due to the low quantities of woody plants. However, topographical variations could provide some escape cover. When found adjacent to sagebrush dominated states, this plant community may provide brood rearing/foraging areas for sage grouse, as well as lek sites. Other birds that would frequent this plant community include western meadowlarks, horned larks, and golden eagles. Many grassland obligate small mammals would occur here.

**Mixed Sagebrush/Grass Plant Community:** The combination of an overstory of sagebrush and an understory of grasses and forbs provide a very diverse plant community for wildlife. The crowns of sagebrush tend to break up hard crusted snow on winter ranges, so mule deer and antelope may use this state for foraging and cover year-round, as would cottontail and jack rabbits. It provides important winter, nesting, brood-rearing, and foraging habitat for sage grouse. Brewer's sparrows' nest in big sagebrush plants, and hosts of other nesting birds utilize stands in the 20-30% cover range.

**Heavy Sagebrush Plant Community:** This plant community can provide important winter foraging for elk, mule deer and antelope, as sagebrush can approach 15% protein and 40-60% digestibility during that time. This community provides excellent escape and thermal cover for large ungulates, as well as nesting and brood rearing habitat for sage grouse.

**Big sagebrush, Birdfoot sage Plant Community:** This plant community may be useful for the same large grazers that would use the Historic Climax Plant Community. However, the plant community composition is less diverse, and thus, less apt to meet the seasonal needs of these animals. It may provide some foraging opportunities for sage grouse when it occurs proximal to woody cover. Good grasshopper habitat equals good foraging for birds.

**Go-back Land Plant Communities:** These communities provide limited foraging for antelope and other grazers. They may be used as a foraging site by sage grouse if proximal to woody cover and if the Historic Climax Plant Community or the Western Wheatgrass/Cheatgrass Plant Community is limiting. Generally, these are not target plant communities for wildlife habitat management.

**Introduced Pasture:** These communities are highly variable depending on the species planted. Refer to Forage Suitability Groups for more information.

**Animal Preferences (Quarterly - 1,2,3,4) for commonly occurring plants in MLRA 43B, 15-19 inch Northern Plains**

COMMON NAME/	SCIENTIFIC NAME	SCI. SYMBOL	Cattle	Sheep	Horses	Mule Deer	Antelope
<b>GRASSES AND GRASS-LIKES</b>							
Alpine timothy	Phelum alpinum	PHAL2	PPPP	PPPP	PPPP	DDDD	UUUU
Baltic rush	Juncus balticus	JUBA	DDDD	UUUU	DDDD	UUUU	UUUU
Basin wildrye	Leymus cinereus	LECI4	PPPP	PPPP	PPPP	DDDD	DDDD
Bearded wheatgrass	Elymus caninus	ELCA	PPPP	DDDD	PPPP	DDDD	DDDD
Big bluegrass	Poa ampla (syn. to Poa secunda)	POAM (POSE)	PPPP	PPPP	PPPP	DDDD	DDDD
Blue grama	Bouteloua gracilis	BOGR2	DDDD	DDDD	DDDD	DDDD	DDDD
Blue wildrye	Elymus glaucus	ELGL	PPPP	DDDD	DDDD	DDDD	DDDD
Bluebunch wheatgrass	Pseudoroegneria spicata	PSSP6	PPPP	PPPP	PPPP	DDDD	DDDD
Bluejoint Reedgrass	Calamagrostis canadensis	CACA4	DDDD	PPPP	PPPP	UUUU	UUUU
Bottlebrush squirreltail	Elymus elymoides	ELELE	DDDD	DDDD	DDDD	UUUU	UUUU
Canada wildrye	Elymus canadensis	ELCA4	PPPP	PPPP	PPPP	DDDD	DDDD
Canby bluegrass	Poa canbyi (syn. to Poa secunda)	POCA (POSE)	PPPP	PPPP	PPPP	PPPP	PPPP
Columbia needlegrass	Achnatherum nelsonii	ACNE3	PPPP	PPPP	DDDD	DDDD	DDDD
Cusic bluegrass	Ribes spp.	RIBES	DDDD	DDDD	DDDD	PPPP	DDDD
Dunehead sedge	Carex phaeocephala	CAPH2	UUUU	UUUU	UUUU	UUUU	UUUU
Fowl bluegrass	Poa palustris	POPA2	DDDD	DDDD	DDDD	UUUU	UUUU
Green needlegrass	Nassella viridula	NAV14	PPPP	PPPP	PPPP	PPPP	PPPP
Idaho fescue	Festuca idahoensis	FEID	PPPP	PPPP	PPPP	PPPP	PPPP
Indian ricegrass	Achnatherum hymenoides	ACHY	PPPP	PPPP	PPPP	PPPP	PPPP
Letterman needlegrass	Achnatherum lettermanii	ACLE9	PPPP	PPPP	DDDD	DDDD	DDDD
Little bluestem	Schizachyrium scoparium	SCSC	PPPP	PPPP	PPPP	DDDD	DDDD
Montana wheatgrass	Elymus albicans	ELAL7	DDDD	DDDD	DDDD	DDDD	DDDD
Mountain bromegrass	Bromus marginatus	BRMA4	PPPP	PPPP	DDDD	DDDD	UUUU
Mountain muhly	Muhlenbergia montana	MUMO	DDDD	DDDD	DDDD	DDDD	UUUU
Nebraska sedge	Carex nebraskensis	CANE2	PPPP	PPPP	PPPP	DDDD	DDDD
Needleandthread	Hesperostipa comata ssp. comata	HECOC8	DPDD	UPDU	DPDD	UDUU	UDUU
Needleleaf sedge	Carex duriuscula	CADU6	UUUU	UUUU	UUUU	UUUU	UUUU
Nodding bromegrass	Bromus anomalus (syn. B. porteri)	BRAN13 (BRPO)	PPPP	PPPP	DDDD	DDDD	UUUU
Northern Reedgrass	Calamagrostis stricta ssp. inexpansa	CASTI3	UPDU	UDUU	UPDU	UDUU	UDUU
Onespike oatgrass	Danthonia unispicata	DAUN	DDDD	PPPP	DDDD	PPPP	DDDD
Plains muhly	Muhlenbergia cuspidata	MUCU3	DDDD	DDDD	DDDD	UUUU	UUUU
Plains reedgrass	Calamagrostis montanensis	CAMO	DDDD	DDDD	DDDD	DDDD	DDDD
Prairie cordgrass	Spartina pectinata	SPPE	PPPP	DDDD	PPPP	UUUU	UUUU
Prairie junegrass	Koeleria macrantha	KOMA	DDDD	DDDD	DDDD	DDDD	DDDD
Pumpelly bromegrass	Bromus inermis spp. Pumpellianus	BRINP5	PPPP	PPPP	DDDD	DDDD	UUUU
Red threeawn	Aristida purpurea	ARPUL	UUUU	UUUU	UUUU	UUUU	UUUU
Reedgrasses	Calamagrostis spp.	CALAM	DDDD	UUUU	DDDD	UUUU	UUUU
Rhizomatous wheatgrasses	Pascopyrum smithii	PASM	DDDD	DDDD	DDDD	DDDD	DDDD
Richardson needlegrass	Achnatherum richardsonii	ACRI8	PPPP	PPPP	DDDD	DDDD	DDDD
Sand bluestem	Andropogon halli	ANHA	PPPP	DDDD	PPPP	UUUU	UUUU
Sand dropseed	Sporobolus cryptandrus	SPCR	DDDD	DDDD	DDDD	UUUU	UUUU
Sandberg bluegrass	Poa secunda	POSE	DDDD	DDDD	DDDD	DDDD	DDDD
Sideoats grama	Bouteloua curtipendula	BOCU	PPPP	PPPP	PPPP	DDDD	UUUU
Slender wheatgrass	Elymus trachycaulus ssp. trachycaulus	ELTRT	DPDD	UPDD	DPDD	UDUU	UDUU
Slough sedge	Carex atherodes	CAAT2	DDDD	DDDD	DDDD	DDDD	DDDD
Spike fescue	Leucopoa kingii	LEKI2	PPPP	DDDD	PPPP	PPPP	DDDD
Spike sedge	Carex nardina	CANA2	DDDD	DDDD	DDDD	UUUU	UUUU
Spike trisetum	Trisetum spicatum	TRSP2	PPPP	DDDD	PPPP	PPPP	DDDD
Tall mannagrass	Glyceria elata (syn. G. striata)	GLEL (GLST)	DDDD	UUUU	DDDD	UUUU	UUUU
Thickspike wheatgrass	Elymus lanceolatus	ELLAL	DDDD	DDDD	DDDD	DDDD	DDDD
Threadleaf sedge	Carex filifolia	CAFI	DDDD	DDDD	DDDD	DDDD	PPPP
Tufted hairgrass	Deschampsia caespitosa	DECA18	PPPP	PPPP	PPPP	DDDD	DDDD
Water sedge	Carex aquatilis	CAAQ	DDDD	UUUU	DDDD	UUUU	UUUU
Western wheatgrass	Pascopyrum smithii	PASM	DDDD	DDDD	DDDD	DDDD	DDDD
<b>FORBS</b>							
American bistort	Polygonum bistortoides	POBI6	DDDD	DDDD	DDDD	DDDD	DDDD
American vetch	Vicia americana	VIAM	PPPP	PPPP	PPPP	PPPP	PPPP
Arrowgrass	Triglochin spp.	TRIGL	TTTT	TTTT	TTTT	TTTT	TTTT
Arrowleaf balsamroot	Triglochin spp.	TRIGL	TTTT	TTTT	TTTT	TTTT	TTTT
Aster	Asters	ASTER	UUUU	UUUU	UUUU	UUUU	UUUU
Balsamroot	Balsamorhiza spp.	BALSA	PPPP	PPPP	PPPP	PPPP	PPPP
Biscuitroot	Lomatium spp.	LOMAT	UDUU	UDUU	UDUU	UDUU	UDUU
Bluebells	Mertensia	MERTE	DDDD	PPPP	DDDD	DDDD	DDDD
Blue-eyed grass	Sisyrinchium spp.	SISYR	DDDD	PPPP	DDDD	DDDD	DDDD
Buckwheat	Eriogonum spp.	ERIOG	UUUU	UUUU	UUUU	UUUU	UUUU
Common commandra	Comandra spp.	COMAN	UUUU	UUUU	UUUU	UUUU	UUUU
Cudweed sagewort	Artemisia ludoviciana	ARLU	UUUU	UUUU	UUUU	UUUU	UUUU

Deathcamas	Zigadenus venenosus	ZIVE	TTTT	TTTT	TTTT	TTTT	TTTT
Dock	Rumex spp.	RUMEX	UUUU	UUUU	UUUU	UUUU	UUUU
Dotted gayfeather	Liatris punctata	LIPU	UPPU	UPPU	UPPU	UPPU	UPPU
Field chickweed	Cerastium arvense	CEAR4	UUUU	UUUU	UUUU	UUUU	UUUU
Flax	Linum spp.	LINUM	UUUU	UUUU	UUUU	UUUU	UUUU
Fleabane	Erigeron spp.	ERIGE2	UUUU	UUUU	UUUU	UUUU	UUUU
Fringed sagewort	Artemisia frigida	ARFR4	UUUU	UUUU	UUUU	UUUU	UUUU
Goldenrod	Solidago spp.	SOLID	NUNN	NUNN	NNNN	NUNN	NUNN
Green sagewort	Artemisia campestris	ARCA12	NNNN	NUUN	NNNN	NUUN	NUUN
Gromwell	Buglossoides spp.	BUGLO	UUUU	UUUU	UUUU	UUUU	UUUU
Groundsel	Senecio spp.	SENEC	NNNN	NNNN	NNNN	NNNN	NNNN
Hairy goldenaster	Heterotheca villosa	HEVI4	UUUU	UUUU	UUUU	UUUU	UUUU
Hawksbeard	Crepis acuminata	CRAC2	UUUU	PPPP	UUUU	DDDD	DDDD
Horsetails	Equisetum spp.	EQUIS	UUUU	UUUU	UUUU	UUUU	UUUU
Iris	Iris spp.	IRIS	UUUU	UUUU	UUUU	UUUU	UUUU
Larkspur	Delphinium spp.	DELPH	TTTT	TTTT	TTTT	TTTT	TTTT
Locoweeds	Oxytropis spp.	OXYTR	TTTT	TTTT	TTTT	TTTT	TTTT
Lupine	Lupinus spp.	LUPIN	DDDD	DDDD	DDDD	DDDD	DDDD
Mint	Menthan spp.	MENTH	UUUU	UUUU	UUUU	UUUU	UUUU
Mountain thermopsis	Thermopsis montana	THMOM3	UUUU	UUUU	UUUU	UUUU	UUUU
Nailwort	Paronychia spp.	PARON	NNNN	NNNN	NNNN	NNNN	NNNN
Pale agoseris	Agoseris glauca	AGGL	DDDD	PPPP	DDDD	DDDD	DDDD
Penstemons	Penstemon spp.	PENST	UPPU	UPPU	UPPU	UPPU	UPPU
Phlox	Phlox spp.	PHLOX	NNNN	NNNN	NNNN	NNNN	NNNN
Prairie clovers	Dalea spp.	DALEA	UPPU	UPPU	UPPU	UPPU	UPPU
Prairie coneflower	Ratibida columnifera	RACO3	DDDD	PPPP	DDDD	PPPP	PPPP
Flax	Linum spp.	LINUM	UUUU	UUUU	UUUU	UUUU	UUUU
Pussytoes	Antennaria spp.	ANTEN	NNNN	NNNN	NNNN	NNNN	NNNN
Sandwort	Arenaria spp.	ARENA	NNNN	NNNN	NNNN	NNNN	NNNN
Silverleaf scurfpea	Pediomelum argophyllum	PEAR6	UUUU	UUUU	UUUU	UUUU	UUUU
Stemless mock goldenweed	Stenotus acaulis	STAC	UUUU	UUUU	UUUU	UUUU	UUUU
Sticky geranium	Geranium viscosissimum	GEVI2	PPPP	PPPP	DDDD	PPPP	DDDD
Stoncrop	Sedum spp.	SEDUM	UUUU	UUUU	UUUU	UUUU	UUUU
Toadflax	Comandra umbellata	COUMP	UUUU	UUUU	UUUU	UUUU	UUUU
Violets	Viola spp.	VIOLA	DDDD	DDDD	DDDD	DDDD	DDDD
Water hemlock	Cicuta spp.	CICUT	TTTT	TTTT	TTTT	TTTT	TTTT
Waterleaf	Hydrophyllum	HYDRO4	DDDD	PPPP	DDDD	PPPP	DDDD
Western virginsbower	Clematis lequisticifolia	CLLI2	UUUU	DDDD	UUUU	DDDD	DDDD
Western wallflower	Erysimum capitatum	ERCAC	DDDD	DDDD	DDDD	DDDD	DDDD
Western yarrow	Achillea millefolium	ACMI2	NUUN	NUUN	NNNN	NUUN	NUUN
<b>TREES/SHRUBS</b>							
American plum	Prunus americana	PRAM	DDDD	DDDD	DDDD	DDDD	UUUU
Big sagebrush	Artemisia tridentata	ARTR2	UUUU	DDDD	UUUU	DDDD	DDDD
Black sagebrush	Artemisia nova	ARNO4	UUUU	PPPP	UUUU	PPPP	PPPP
Boxelder	Acer negundo	ACNE2	UUUU	UUUU	UUUU	UUUU	UUUU
Chokecherry	Prunus virginiana	PRVI	DDDD	DDDD	DDDD	PPPP	DDDD
Common Juniper	Juniperus communis	JUSCO6	UUUU	UUUU	UUUU	UUUU	UUUU
Cottonwoods	Tanacetum vulgare	TAVU	UUUU	UUUU	UUUU	UUUU	UUUU
Green ash	Fraxinus pennsylvanica	FRPE	UUUU	UUUU	UUUU	UDDU	UDDU
Hawthorn	Crataegus spp.	CRATA	UUUU	UUUU	UUUU	UUUU	UUUU
Juniper	Juniperus scopulorum	JUSC2	UUUU	UUUU	UUUU	DDDD	UUUU
Mountain mahogany	Cercocarpus spp.	CERCO	DDDD	PPPP	UUUU	PPPP	UUUU
Ponderosa pine	Pinus ponderosa	PIPO	UTTU	UNNU	UNNU	UNNU	UNNU
Rocky-Mountain juniper	Juniperus scopulorum	JUSC2	UNNU	UNNU	UNNU	UNNU	DUUD
Rubber rabbitbrush	Ericameria nauseosa	ERNA10	UUUU	DDDD	UUUU	DDDD	DDDD
Silver sagebrush	Artemisia cana	ARCAC5	DDDD	DDDD	DDDD	PPPP	PPPP
Skunkbush sumac	Rhus trilobata	RHTR	DDDD	DDDD	DDDD	DDDD	DDDD
Snowberry	Symphoricarpos occidentalis	SYOC	UUUU	UUUU	UUUU	DDDD	UUUU
Threetip sagebrush	Artemisia tripartita	ARTR4	UUUU	DDDD	UUUU	UUUU	DDDD
Wild rose	Rosa woodsii var. woodsii	ROWOW	DDDD	DDDD	UUUU	DDDD	DDDD
Willows	Salix L.	SALIX	PPPP	PPPP	DDDD	PPPP	UUUU
Winterfat	Krascheninnikovia lanata	KRLA2	PPPP	PPPP	PPPP	PPPP	PPPP
Yucca	Yucca glauca	YUGL	DDDD	DDDD	DDDD	DDDD	DDDD

## Animal Community – Grazing Interpretations

The following table lists suggested stocking rates for cattle under continuous season-long grazing under normal growing conditions. These are conservative estimates that should be used only as guidelines in the initial stages of the conservation planning process. Often, the current plant composition does not entirely match any particular plant community (as described in this ecological site description). Because of this, a field visit is recommended, in all cases, to document plant composition and production. More precise carrying capacity estimates should eventually be calculated using this information along with animal preference data, particularly when grazers other than cattle are involved. Under more intensive grazing management, improved harvest efficiencies can result in an increased carrying capacity. If distribution problems occur, stocking rates must be reduced to maintain plant health and vigor.

Plant Community	Production (lb./ac)	Carrying Capacity* (AUM/ac)
Rhiz. WG, Idaho Fescue, Green needlegrass	1400-2900	.6
Heavy Sagebrush	900-2000	.35
Mixed Sagebrush/Grass	900-2400	.5
Big sagebrush, Birdfoot sage	600-1400	.30
Go-back Land	800-1200	.35

\* - Continuous, season-long grazing by cattle under average growing conditions.

Grazing by domestic livestock is one of the major income-producing industries in the area. Rangeland in this area may provide yearlong forage for cattle, sheep, or horses. During the dormant period, the forage for livestock use needs to be supplemented with protein because the quality does not meet minimum livestock requirements.

## Hydrology Functions

Water is the principal factor limiting forage production on this site. This site is dominated by soils in hydrologic group C, with localized areas in hydrologic group D. Infiltration ranges from slow to moderately slow. Runoff potential for this site varies from moderate to high depending on soil hydrologic group 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 short-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 Part 630, NRCS National Engineering Handbook for detailed hydrologic information).

Rills and gullies should not typically be present. Water flow patterns should be barely distinguishable if at all present. Pedestals are only slightly present in association with bunchgrasses. Litter typically falls in place, and signs of movement are not common. Chemical and physical crusts are rare to non-existent. Cryptogamic crusts are present, but only cover 1-2% of the soil surface.

## Recreational Uses

This site provides hunting opportunities for upland game species. The wide variety 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

None noted.

## Supporting Information

### Associated Sites

Shallow Clayey	043BY458WY
Overflow	043BY430WY
Lowland	043BY428WY

### Similar Sites

() – Clayey 10-14” Northern Plains P.Z., 058BY104WY has lower production.

### Inventory Data References (narrative)

Information presented here has been derived from NRCS clipping data and other inventory data. Field observations from range trained personnel was also used. Other sources used as references include USDA NRCS Water and Climate Center, USDA NRCS National Range and Pasture Handbook, and USDA NRCS Soil Surveys from various counties.

### Inventory Data References

<u>Data Source</u>	<u>Number of Records</u>	<u>Sample Period</u>	<u>State</u>	<u>County</u>
SCS-RANGE-417		1971-1994	WY	
Ocular estimates		1990-1999	WY	

### Site Correlation

### Type Locality

### Field Offices

Buffalo, Sheridan

### Relationship to Other Established Classifications

### Other References

### Site Description Approval

\_\_\_\_\_  
State Range Management Specialist

\_\_\_\_\_  
Date

## Ecological Reference Worksheet

Author(s)/participant(s): \_\_\_\_\_  
 Contact for lead author: \_\_\_\_\_ Reference site used? Yes/No  
 Date: 4/05 MLRA: 43B Ecological Site: R043BY404WY Clayey (Cy) 15-19"NP

\_\_\_\_\_ This *must* be verified based on soils and climate (see Ecological Site Description). Current plant community *cannot* be used to identify the ecological site.

<p><b>Indicators.</b> For each indicator, describe the potential for the site. Where possible, (1) use numbers, (2) include expected range of values for above- and below-average years for <b>each</b> community within the reference state, when appropriate &amp; (3) cite data. Continue descriptions on separate sheet.</p>
<p><b>1. Number and extent of rills:</b> Rills should not be present</p>
<p><b>2. Presence of water flow patterns:</b> Barely observable</p>
<p><b>3. Number and height of erosional pedestals or terracettes:</b> Essentially non-existent</p>
<p><b>4. Bare ground from Ecological Site Description or other studies (rock, litter, lichen, moss, plant canopy are <i>not</i> bare ground):</b> Bare ground is 15-25% occurring in small areas throughout site</p>
<p><b>5. Number of gullies and erosion associated with gullies:</b> Active gullies should not be present</p>
<p><b>6. Extent of wind scoured, blowouts and/or depositional areas:</b> None</p>
<p><b>7. Amount of litter movement (describe size and distance expected to travel):</b> Little to no plant litter movement. Plant litter remains in place and is not moved by erosional forces.</p>
<p><b>8. Soil surface (top few mm) resistance to erosion (stability values are averages – most sites will show a range of values for both plant canopy and interspaces, if different):</b> Plant cover and litter is at 75% or greater of soil surface and maintains soil surface integrity. Soil Stability class is anticipated to be 5 or greater.</p>
<p><b>9. Soil surface structure and SOM content (include type and strength of structure, and A-horizon color and thickness for both plant canopy and interspaces, if different):</b> Use Soil Series description for depth and color of A-horizon</p>
<p><b>10. Effect of plant community composition (relative proportion of different functional groups) &amp; spatial distribution on infiltration &amp; runoff:</b> Grass canopy and basal cover should reduce raindrop impact and slow overland flow providing increased time for infiltration to occur. Healthy deep rooted native grasses enhance infiltration and reduce runoff. Infiltration is Slow.</p>
<p><b>11. Presence and thickness of compaction layer (usually none; describe soil profile features which may be mistaken for compaction on this site):</b> No compaction layer or soil surface crusting should be present.</p>
<p><b>12. Functional/Structural Groups (list in order of descending dominance by above-ground weight using symbols: &gt;&gt;, &gt;, = to indicate much greater than, greater than, and equal to):</b> Mid stature Cool Season Bunch Grasses &gt; Mid stature Cool Season Rhizomatous Grasses &gt; Short stature Grasses/grasslikes &gt; Shrubs = Forbs</p>
<p><b>13. Amount of plant mortality and decadence (include which functional groups are expected to show mortality or decadence):</b> Very Low</p>
<p><b>14. Average percent litter cover and depth :</b> Average litter cover is 30-40% with depths of 0.5 to 1.0 inches</p>
<p><b>15. Expected annual production (this is all above-ground production, not just forage production):</b> 2100 lbs/ac</p>
<p><b>16. Potential invasive (including noxious) species (native and non-native). List species which characterize degraded states and which, after a threshold is crossed, “can, and often do, continue to increase regardless of the management of the site and may eventually dominate the site”:</b> Blue grama, big sagebrush, birdfoot sagebrush, cheatgrass, and Species found on Noxious Weed List</p>
<p><b>17. Perennial plant reproductive capability:</b> All species are capable of reproducing</p>