

United States Department of Agriculture Natural Resources Conservation Service

Ecological Site Description

Site Type: Rangeland

Site Name: Clayey (Cy) 5-9” Wind River Basin Precipitation Zone

Site ID: R032XY204WY

Major Land Resource Area: 32 – Northern Intermountain Desertic Basins

Physiographic Features

This site occurs on nearly level to 30% slopes.

Landform: Hillsides, alluvial fans & stream terraces **Aspect:** N/A

	<u>Minimum</u>	<u>Maximum</u>
Elevation (feet):	4500	6600
Slope (percent):	0	30
Water Table Depth (inches):	None within 60 inches	
Flooding:		
Frequency:	None	rare
Duration:	None	extremely brief
Ponding:		
Depth (inches):	0	0
Frequency:	None	occasional
Duration:	None	brief
Runoff Class:	very low	very high

Climatic Features

Annual precipitation ranges from 5-9 inches per year. The normal precipitation pattern shows peaks in May and June and a secondary peak in September. This amounts to about 50% of the mean annual precipitation. Much of the moisture that falls in the latter part of the summer is lost by evaporation and much of the moisture that falls during the winter is lost by sublimation. Average snowfall is about 20 inches annually. Wide fluctuations may occur in yearly precipitation and result in more dry years than those with more than normal precipitation.

Temperatures show a wide range between summer and winter and between daily maximums and minimums, due to the high elevation and dry air, which permits rapid incoming and outgoing radiation. Cold air outbreaks from Canada in winter move rapidly from northwest to southeast and account for extreme minimum temperatures. Chinook winds may occur in winter and bring rapid rises in temperature. Extreme storms may occur during the winter, but most severely affect ranch operations during late winter and spring.

High winds are generally blocked from the basin by high mountains, but can occur in conjunction with an occasional thunderstorm.

Growth of native cool-season plants begins about April 1 and continues to about July 1. Cool weather and moisture in September may produce some green up of cool season plants that will continue to late October.

The following information is from the “Pavillion” climate station:

	<u>Minimum</u>	<u>Maximum</u>	<u>5 yrs. out of 10 between</u>
Frost-free period (days):	95	175	May 19 – September 19
Freeze-free period (days):	98	185	May 6 – October 3
Mean Annual Precipitation (inches):	2.50	12.54	

Mean annual precipitation: 7.85 inches

Mean annual air temperature: 44.53°F (30.5°F Avg. Min. to 58.5°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 “Riverton”, “Arminto”, and “Lost Cabin”.

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

Soils

The soils of this site are moderately deep (greater than 20” to bedrock) to very deep, moderately well to well-drained soils that formed in alluvium or alluvium over residuum. These soils have slow to moderate permeability. The surface soil will vary from 2 to 5 inches deep. These soils may develop severe cracks. The soil characteristics having the most influence on plants are the heavy texture, available moisture, and potential for elevated quantities of soluble salts.

Major Soil Series correlate to this site include: Youngston

Other Soil Series correlated to this site in MLRA 32 include:

Representative Soil Features

Parent Material Kind: alluvium and residuum

Parent Material Origin: shale, calcareous

Surface Texture: clay loam, clay, silty clay loam, silty clay, fine sandy loam, loam, sandy clay

Surface Texture Modifier: none

Subsurface Texture Group: clay,

Surface Fragments ≤ 3” (% Cover): 0

Surface Fragments > 3” (%Cover): 0

Subsurface Fragments ≤ 3” (% Volume): 0

Subsurface Fragments > 3” (% Volume): 0

	<u>Minimum</u>	<u>Maximum</u>
Drainage Class:	moderately well drained	well drained
Permeability Class:	slow	moderate
Depth (inches):	20	>60

Site Type: Rangeland
MLRA: 32 – Northern Intermountain Desertic Basin

Clayey (Cy) 5-9 WR
R032XY204WY

Electrical Conductivity (mmhos/cm) $\leq 20''$:	0	4
Sodium Absorption Ratio $\leq 20''$:	0	12
Soil Reaction (1:1 Water) $\leq 20''$:	7.4	9.0
Soil Reaction (0.1M CaCl₂) $\leq 20''$:	NA	NA
Available Water Capacity (inches) $\leq 30''$:	3.0	6.0
Calcium Carbonate Equivalent (percent) $\leq 20''$:	0	5

Plant Communities

Ecological Dynamics of the Site:

Potential vegetation on this site is dominated by mid cool-season perennial grasses. Other significant vegetation includes big sagebrush, winterfat, Gardner's saltbush, birdfoot sagebrush, and a variety of forbs. The expected potential composition for this site is about 70% grasses, 10% forbs and 20% woody plants. The composition and production will vary naturally due to historical use, fluctuating precipitation and fire frequency.

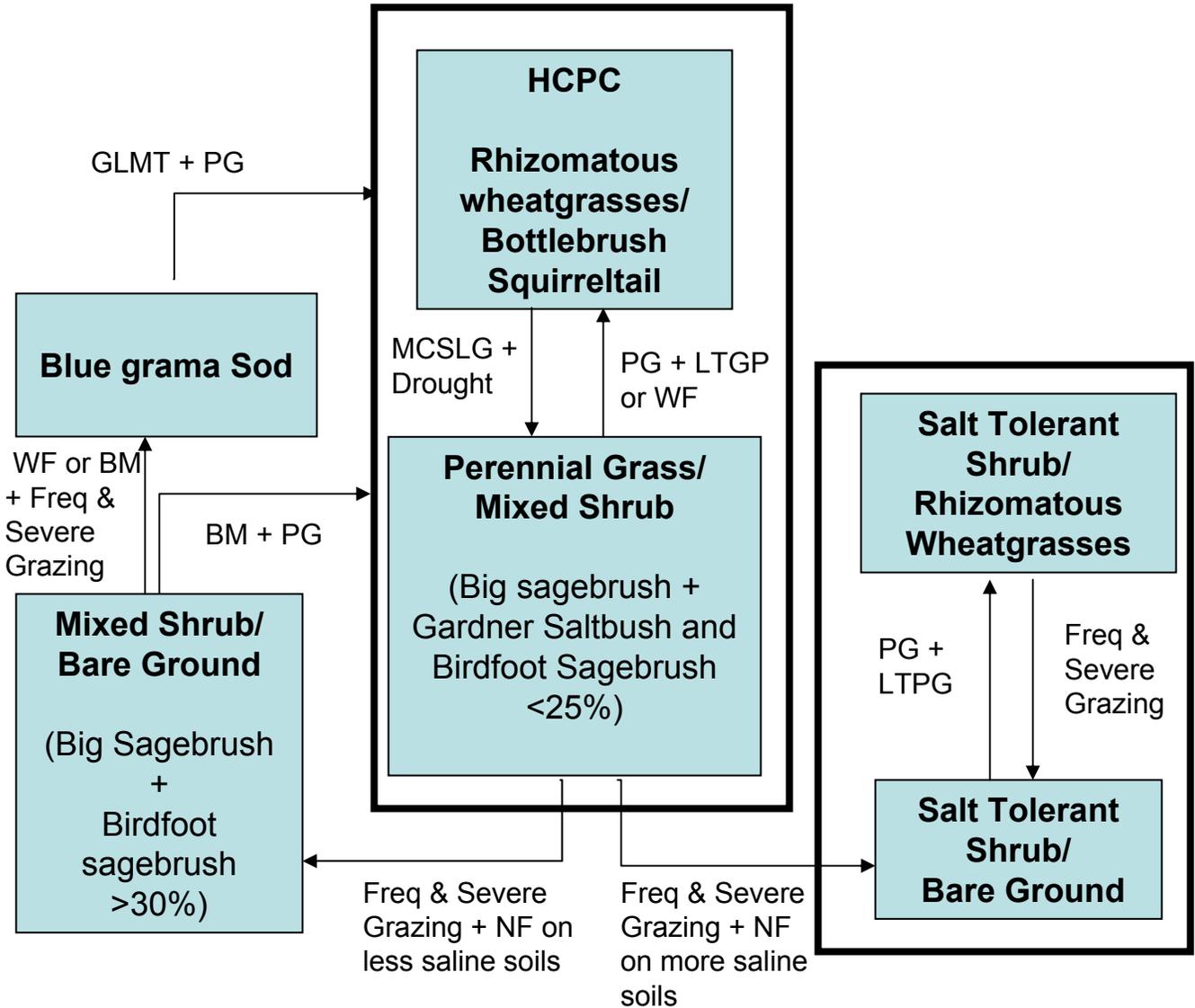
As this site deteriorates species such as blue grama, plains pricklypear, birdfoot sagebrush, and big sagebrush will increase. Weedy annuals will invade. Cool-season grasses such as western wheatgrass, bottlebrush squirreltail, and Indian ricegrass will decrease in frequency and overall production.

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.

Due to the amount and pattern of the precipitation, the big sagebrush component typically is not resilient once it has been removed if a healthy and vigorous stand of grass exists and is maintained. The exception to this is where the herbaceous component is severely degraded at the time of treatment, growing conditions are unfavorable after treatment, and/or recovery periods are inadequate due to poor grazing management.

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)
- WF** - Wildfire (Natural or Human Caused)

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: 300		
GRASSES AND GRASS-LIKES					
GRASSES/GRASSLIKES					
Western wheatgrass	Pascopyrum smithii	PASM	1	75 - 135	25 - 45
Bottlebrush squirreltail	Elymus elymoides	ELELE	2	45 - 75	15 - 25
Indian ricegrass	Achnatherum hymenoides	ACHY	3	15 - 30	5 - 10
Griffiths wheatgrass or Bluebunch wheatgrass	Elymus albicans Pseudoroegneria spicata	ELAL7 PSSP6	4	0 - 15	0 - 5
MISC. GRASSES/GRASSLIKES			5	15 - 45	5 - 15
Green needlegrass	Nassella viridula	NAV14	5	0 - 15	0 - 5
Sandberg bluegrass	Poa secunda	POSE	5	0 - 15	0 - 5
Prairie junegrass	Koeleria macrantha	KOMA	5	0 - 15	0 - 5
Threadleaf sedge	Carex filifolia	CAFI	5	0 - 15	0 - 5
Blue grama	Bouteloua gracilis	BOGR2	5	0 - 15	0 - 5
other perennial grasses (native)		2GP	5	0 - 15	0 - 5
FORBS			6	15 - 30	5 - 10
Scarlet globemallow	Sphaeralcea coccinea	SPCO	6	0 - 15	0 - 5
Hood's phlox	Phlox hoodii	PHHO	6	0 - 15	0 - 5
Wild onion	Allium textile	ALTE	6	0 - 15	0 - 5
Leafy wildparsley	Musineon divaricatum	MUDI	6	0 - 15	0 - 5
Smooth woodyaster	Xylorhiza glabruiscula	XUGL	6	0 - 15	0 - 5
Western aster	Symphyotrichum ascendens	SYAS3	6	0 - 15	0 - 5
Small-leaf pussytoes	Antennaria parvifolia	ANPA4	6	0 - 15	0 - 5
Cous biscuitroot	Lomatium cous	LOCO4	6	0 - 15	0 - 5
Parsnipflower buckwheat	Eriogonum heracleoides	ERHE2	6	0 - 15	0 - 5
Threadleaf daisy	Erigeron filifolius	ERFI2	6	0 - 15	0 - 5
Tapertip hawkbeard	Crepis acuminata	CRAC2	6	0 - 15	0 - 5
Missouri milkvetch	Astragalus missouriensis	ASMI10	6	0 - 15	0 - 5
American vetch	Vicia americana	VIAM	6	0 - 15	0 - 5
Meadow deathcamas	Zigadenas venenosus	ZIVE	6	0 - 15	0 - 5
Plains pricklypear cactus	Opuntia polyacantha	OPPO	6	0 - 15	0 - 5
other perennial forbs (native)		2FP	6	0 - 15	0 - 5
TREES/SHRUBS					
Wyoming big sagebrush	Artemisia tridentata wyomingensis	ARTRW8	7	15 - 45	5 - 15
Winterfat	Krascheninnikovia lanata	KRAL2	8	15 - 30	5 - 10
Gardner's saltbush	Atriplex gardneri	ATGA	9	0 - 15	0 - 5
MISC. SHRUBS			10	15 - 30	5 - 10
Rubber rabbitbrush	Ericameria nauseosa	ERNA10	10	0 - 15	0 - 5
Green rabbitbrush	Chrysothamnus viscidiflorus	CHVI8	10	0 - 15	0 - 5
Birdfoot sagebrush	Artemisia pedatifida	ARPE6	10	0 - 15	0 - 5
Greasewood	Sarcobatus vermiculatus	SAVE4	10	0 - 15	0 - 5
other shrubs & half shrubs (native)		2SHRUB	10	0 - 15	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/Bottlebrush Squirreltail Community

The interpretive plant community for this site is the Historic Climax Plant Community. This state evolved with grazing by large herbivores and periodic fires. The cyclical nature of the fire regime in this community prevented big sagebrush from being the dominant landscape. This plant community can be found on areas that are properly managed with grazing and/or prescribed burning, and on areas receiving occasional short periods of rest. Potential vegetation is about 70% grasses or grass-like plants, 10% forbs, and 20% woody plants. Cool season mid-grasses dominate the state.

The major grasses include western and thickspike wheatgrasses, bottlebrush squirreltail, and Indian ricegrass. Other grasses occurring in this state include Sandberg bluegrass and blue grama. Woody species are a conspicuous element of this state, and occurs in mosaic patterns across the site. Big sagebrush can make up to 15% of the annual production and winterfat can make up to 10%. Natural fire occurred frequently in this community and prevents big sagebrush from becoming a dominant species. A variety of forbs also occurs in this state and plant diversity is high (see Plant Composition Table).

The total annual production (air-dry weight) of this state is about 300 pounds per acre, but it can range from about 200 lbs./acre in unfavorable years to about 500 lbs./acre in above average years.

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	50	25	5	0	10	0	0	0

(monthly percentages of total annual growth)

The state is stable and well adapted to the Northern Great Plains climatic conditions. The diversity in plant species allow for high drought resistance. 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:

- Drought, and moderate season long grazing with the absence of fire, will convert this plant community to the *Perennial Grass/Mixed Shrub Plant Community*.

Perennial Grass/Mixed Shrub Plant Community

Historically, this plant community evolved under grazing by large ungulates and a low fire frequency. Currently, this site is normally found under a moderate, season-long grazing regime and in the absence of fire or brush control. Prolonged drought can also play an important role and will exacerbate these conditions. Big sagebrush, Gardner’s saltbush, and birdfoot sagebrush are important components 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 wheatgrasses, and bottlebrush squirreltail. Forbs commonly found in this plant community, include fringed sagewort, hairy goldenaster, phlox, wild onion, plains spring parsley, and scarlet globemallow. The annual production of shrubs has increased as compared to the HCPC and may become as much as 25% of the total of the percentage composition of the plant community. The overstory of sagebrush and understory of grass and forbs provide a diverse plant community.

When compared to the Historic Climax Plant Community, big sagebrush and blue grama have increased. Plains pricklypear cactus will also have increased, but occurs only in small patches. Indian ricegrass has decreased and may occur in only trace amounts under the sagebrush canopy or within the patches of pricklypear. In addition, winterfat may or may not have changed depending on the season of use.

The total annual production (air-dry weight) of this state is about 250 pounds per acre, but it can range from about 150 lbs./acre in unfavorable years to about 400 lbs./acre in above average years.

The following is the growth curve 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	50	25	5	0	10	0	0	0

(monthly percentages of total annual growth)

This plant community is resistant to change. The herbaceous species present are well adapted to grazing; however, species composition can be altered through long-term overgrazing. The herbaceous component is mostly intact and plant vigor and replacement capabilities are sufficient. Water flow patterns and litter movement may be occurring but only on steeper slopes. Incidence of pedestalling is minimal. Soils are mostly stable and the surface shows minimum soil loss. The watershed is functioning and the biotic community is intact.

Transitional pathways leading to other plant communities are as follows:

- Prescribed grazing or possible long-term prescribed grazing will return this state to near *Historic Climax Plant Community*. The probability of this occurring is high especially if rotational grazing along with short deferred grazing is implemented as part of prescribed method of use. In addition, the removal of fire suppression will allow a somewhat natural fire regime to reoccur

to more easily transition between this plant community and the HCPC. A prescribed fire treatment can be useful to hasten this transition if desired.

- Frequent and severe grazing with the absences of fire on less saline soils will convert this plant community to a *Mixed Shrub/Bare Ground Vegetation State*.
- Frequent and severe grazing plus no fire on more saline soils will convert this state to *Salt Tolerant Shrub/Bare Ground Vegetative State*.

Mixed Shrub/Bare Ground Plant Community

This plant community evolved under frequent and severe grazing with the absence of fire. Big sagebrush is the dominant species of this plant community. Cool-season grasses have been mostly eliminated and if still present can only be found under the sagebrush canopy. The interspaces between plants have expanded leaving the amount of bare ground more prevalent and more soil surface exposed to erosive elements.

The dominant grasses are Sandberg bluegrass, and blue grama. Weedy annual species such as cheatgrass have invaded if a seed source is available. Cactus and sageworts often increase. Noxious weeds such as Russian Knapweed, leafy spurge, or Canada thistle may invade the site. Plant diversity is moderate to poor. When compared with the HCPC or the Mixed Shrub/ Perennial Grass Plant Communities, the annual production is similar, as the shrub production compensates for the decline in the herbaceous production.

The total annual production (air-dry weight) of this state is about 250 pounds per acre, but it can range from about 175 lbs./acre in unfavorable years to about 325 lbs./acre in above average years.

The following is the growth curve 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	50	25	5	0	10	0	0	0

(monthly percentages of total annual growth)

This plant community is resistant to change as the stand becomes more decadent. These areas may actually be more resistant to fire as less fine fuels are available and the bare ground between the sagebrush plants is increased. Continued frequent and severe grazing or the removal of grazing does not seem to affect the plant composition or structure of the plant community. Plant diversity is moderate to low. The plant vigor is diminished and replacement capabilities are limited due to the reduced number of cool-season grasses. Plant litter is noticeably less when compared to the HCPC.

Soil erosion is accelerated because of increased bare ground. Water flow patterns and pedestalling are obvious. Infiltration is reduced and runoff is increased. Rill channels may be noticeable in the interspaces and gullies may be establishing where rills have concentrated down slope.

Transitional pathways leading to other plant communities are as follows:

- Brush Management or wildfire followed by frequent and severe grazing, will convert this plant community to a Blue Grama Sod Plant Community.

- Brush management followed by prescribed grazing and seeding if necessary, will return this plant community at or near the HCPC. If prescribed fire is used as a means to reduce or remove the shrubs, sufficient fine fuels will need to be present. This may require deferment from grazing prior to treatment. Post management is critical to ensure success. This can range from two or more years of rest to partial growing season deferment, depending on the condition of the understory at the time of treatment and the growing conditions following treatment. In the case of an intense wildfire that occurs when desirable plants are not completely dormant, the length of time required to reach the HCPC may be increased and seeding of natives is recommended.

Blue Grama Sod Plant Community

This plant community is the result of frequent and severe yearlong grazing. Soils on these sites are usually less saline. It is dominated by a dense sod of blue grama and includes a mosaic shrub overstory. Big sagebrush may be present but usually birdfoot sagebrush is the most important shrub in this plant community. Pricklypear cactus can become dense in areas so that livestock cannot graze forage growing within the cactus clumps.

When compared with the Historic Climax Plant Community warm season grasses have replaced most cool season midgrasses. Blue grama, threadleaf sedge, and pricklypear have increased. All cool-season mid-grasses, forbs, and most shrubs have been greatly reduced. Production has been significantly decreased.

The total annual production (air-dry weight) of this state is about 75 pounds per acre, but it can range from about 50 lbs./acre in unfavorable years to about 150 lbs./acre in above average years.

The following is the growth curve 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	50	25	5	0	10	0	0	0

(monthly percentages of total annual growth)

This sod is extremely resistant to change and continued frequent and severe grazing or the removal of grazing does not seem to affect the plant composition or structure of the plant community. The biotic integrity of this state is not functional and plant diversity is extremely low. Plant vigor is significantly weakened and replacement capabilities are limited due to the reduced number of cool-season grasses.

This state is stable and protected from excessive erosion. The sod formed by these grasses is resistant to water infiltration. While the soil is protected by this sod, excessive runoff may occur off-site. As a result, rills or other more severe erosion can occur on the adjoining sites. The watershed may or may not be functioning, as runoff may affect adjoining sites. The biotic integrity of this plant community is not intact.

Transitional pathways leading to other plant communities are as follows:

- Grazing land mechanical treatment (chiseling and seeding, etc.) followed by prescribed grazing will return this plant community to near *Historic Climax Plant Community*.

Salt Tolerant Shrub/Bare Ground Plant Community

This plant community can occur where states are subjected to continuous yearlong grazing and where soils are influenced by elevated amount of soluble salts. Salt tolerant shrubs are a significant component of the plant community and the preferred cool season grasses have been eliminated or greatly reduced. Wyoming big sagebrush is still a component of the plant community but does not dominant the overstory shrub species.

This site is dominated by an overstory of shrubs, which can vary widely in the composition and production. This variation results from the dissimilarity in quantity of soluble salts present in the soils and the availability of shrubs to occupy the site. The dominant shrubs are big sagebrush, rubber rabbitbrush, greasewood and a number of different saltbushes.

Perennial cool season mid-grasses have been removed leaving mostly patches of blue grama and annuals. Cheatgrass and weedy annual forbs such as halogeton, Russian thistle, and kochia, will occupy the site if a seed source is available. Noxious weeds such as Russian knapweed may also invade this site. When compared to the HCPC, grass production has diminished but is compensated by the increase in shrub production. The plant species, however, are completely distinct.

The interspaces between plants have expanded leaving the amount of bare ground more prevalent. Surface salts have increased, especially on sites dominated by greasewood and saltbushes. The leaves of these plants contain high amounts of sodium and other salts, and when shed these soluble salts are transferred to the soils underneath the plants. Consequently, the soil can exhibit wide variations in soluble salts, which can explain the variation in shrub composition.

The total annual production (air-dry weight) of this state is about 200 pounds per acre, but it can range from about 75 lbs./acre in unfavorable years to about 275 lbs./acre in above average years.

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	50	25	5	0	10	0	0	0

(Monthly percentages of total annual growth)

This plant community is resistant to change. These areas are actually more resistant to fire as less fine fuels are available and the bare ground between the shrubs has increased. Continued frequent and severe grazing or the removal of grazing does not seem to affect the composition or structure of the plant community. Plant diversity is moderate to poor. The biotic integrity of this state is mostly dysfunctional because of the predominant salt tolerant shrub overstory and absence of perennial cool-season grasses.

Soil erosion is accelerated because of increased bare ground. Water flow patterns and pedestalling are obvious. Infiltration is reduced and runoff is increased. Rill channels may be noticeable in the interspaces and gullies may be establishing where rills have concentrated down slope.

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

- Prescribed grazing or possibly long-term prescribed grazing, will convert this plant community to the *Salt Tolerant Shrub/Rhizomatous Wheatgrass Vegetative State*. Recovery to near *Historic Climax Plant Community* condition is difficult to impossible due to the resistance of these shrubs to herbicides and other brush management techniques. In addition, the increase

in surface salts has had accumulated effects on the soil so most of the herbaceous plants associated with the HCPC are no longer suitable for this site. The most notable exception is the rhizomatous wheatgrasses and bottlebrush squirreltail. Soil remediation to reduce the surface salts is not recommended, as this is mostly ineffective and extremely costly. Seeding more salt-tolerant native grasses and forbs will improve the productivity and plant cover of the site.

Salt Tolerant Shrub/Rhizomatous Wheatgrasses Plant Community

This plant community can occur where a prescribed grazing plan is implemented in the Salt Tolerant/Bare Ground Plant Community. Salt tolerant shrubs and Wyoming big sagebrush still remain a significant component of the plant community but preferred cool season grasses have reestablished.

This site is dominated by an overstory of a variety of shrubs, such as Wyoming big sagebrush, rubber rabbitbrush, greasewood, and a variety of saltbushes. Some perennial cool season mid-grasses have once again reestablished such as rhizomatous wheatgrasses and bottlebrush squirreltail. Other important grasses include Sandberg bluegrass and blue grama. Patches of annuals such as cheatgrass and other weedy annual forbs such as halogeton, Russian thistle, and kochia, will persist on this site. Noxious weeds such as Russian knapweed may also remain if not treated. The interspaces between plants will have diminished in size. When compared with the HCPC or the Mixed Shrub/ Perennial Grass Plant Communities, the annual production is similar, but the species are clearly unique.

The total annual production (air-dry weight) of this state is about 275 pounds per acre, but it can range from about 200 lbs./acre in unfavorable years to about 425 lbs./acre in above average years.

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	50	25	5	0	10	0	0	0

(Monthly percentages of total annual growth)

This plant community is mostly resistant to change, but species composition can be altered through long-term overgrazing. The herbaceous component is stable and plant vigor and replacement capabilities are sufficient. The biotic community is not intact because of the predominant salt tolerant shrub overstory and the lack of cool-season climax grasses. Plant diversity is moderate

Soils are mostly stable and recent soil loss is minimal. The remnant evidence of erosion should not be confused with current erosion processes. Water flow patterns and litter movement is stable but is still occurring on steeper slopes. Incidence of pedestalling is improving. The watershed may or may not be functioning

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

- Frequent and severe grazing will convert the plant community to the *Salt Tolerant Shrub/Bare Ground Plant Community*.

- Recovery to near *Historic Climax Plant Community* condition is difficult to impossible due to the resistance of these shrubs to herbicides and other brush management techniques. In addition, the increase in surface salts has had accumulated effects on the soil so most of the herbaceous plants associated with the HCPC are no longer suitable for this site. The most notable exception is the rhizomatous wheatgrasses and bottlebrush squirreltail. Soil remediation to reduce the surface salts is not recommended, as this is mostly ineffective and extremely costly. Seeding more salt-tolerant grasses and forbs will improve the productivity of site and plant cover, but will not improve the biotic integrity.

Ecological Site Interpretations

Animal Community – Wildlife Interpretations

Rhizomatous Wheatgrasses/Bottlebrush Squirreltail (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.

Perennial Grass/Mixed Shrub Plant Community: The combination of an overstory of sagebrush and an understory of grasses and forbs provides 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 a host of other nesting birds utilize stands in the 20-30% cover range.

Mixed Shrub/Bare Ground 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 nesting habitat for upland game birds. However, it provides little foraging opportunities for upland game birds, as fewer forbs are available. Many grassland obligate small mammals would occur here.

Blue Grama Sod Plant Community: 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 Big Sagebrush/Perennial Grass Plant Community is limiting. Generally, these are not target plant communities for wildlife habitat management.

Salt Tolerant Shrub/Bare Ground Plant Community: This plant community exhibits a low level of plant species diversity due to the accumulation of salts near the soil surface. It does, however, provide thermal and escape cover for upland birds. Upland game birds may find little foraging opportunities, as fewer forbs are available. Many grassland obligate small mammals would occur here.

Salt Tolerant Shrub/Rhizomatous Wheatgrass Plant Community: This plant community can provide winter foraging for elk, mule deer and antelope. This community provides nesting habitat for upland game birds. However, it provides little foraging opportunities for upland game birds, as fewer forbs are available. Many grassland obligate small mammals would occur here.

Animal Preferences (Quarterly - 1,2,3,4) for commonly occurring plants in MLRA 32XY, 5-9 inch Wind River Basin

COMMON NAME/ GROUP NAME	SCIENTIFIC NAME	SCIENTIFIC SYMBOL	Cattle	Sheep	Horses	Mule Deer	Antelope
GRASSES/GRASSLIKES							
alkali bluegrass	<i>Poa secunda</i> ssp. <i>juncifolia</i>	POSEJ	DDDD	PPPP	DDDD	PPPP	PPPP
alkali cordgrass	<i>Spartina gracilis</i>	SPGR	DDDD	UUUU	DDDD	UUUU	UUUU
alkali sacaton	<i>Sporobolus airoides</i>	SPAI	PPPP	DDDD	PPPP	DDDD	DDDD
American manna grass	<i>Glyceria grandis</i>	GLGR	DDDD	UUUU	DDDD	UUUU	UUUU
American sloughgrass	<i>Beckmannia syzigachne</i>	BESY	DDDD	UUUU	DDDD	UUUU	UUUU
Baltic rush	<i>Juncus balticus</i>	JUBA	DDDD	UUUU	DDDD	UUUU	UUUU
basin wildrye	<i>Leymus cinereus</i>	LECI4	PPPP	PPPP	PPPP	DDDD	DDDD
beaked sedge	<i>Carex rostrata</i>	CARO6	DDDD	UUUU	DDDD	UUUU	UUUU
bearded wheatgrass	<i>Elymus caninus</i>	ELCA	PPPP	DDDD	PPPP	DDDD	DDDD
big bluegrass	<i>Poa ampla</i> (syn. to <i>Poa secunda</i>)	POAM (POSE)	PPPP	PPPP	PPPP	PPPP	PPPP
blue grama	<i>Bouteloua gracilis</i>	BOGR2	DDDD	DDDD	DDDD	DDDD	DDDD
bluebunch wheatgrass	<i>Pseudoroegneria spicata</i>	PSSP6	PPPP	PPPP	PPPP	DDDD	DDDD
bottlebrush squirreltail	<i>Elymus elymoides</i>	ELELE	DDDD	DDDD	DDDD	UUUU	UUUU
bulrush	<i>Scirpus</i> spp.	SCIRP	DDDD	UUUU	DDDD	UUUU	UUUU
Canada wildrye	<i>Elymus canadensis</i>	ELCA4	PPPP	PPPP	PPPP	DDDD	DDDD
Fendler threawn	<i>Aristida purpurea longiseta</i>	ARPUL	UUUU	UUUU	UUUU	UUUU	UUUU
Indian ricegrass	<i>Achnatherum hymenoides</i>	ACHY	PPPP	PPPP	PPPP	PPPP	PPPP
inland saltgrass	<i>Distichlis spicata</i>	DISP	UUUU	UUUU	UUUU	UUUU	UUUU
little bluestem	<i>Schizachyrium scoparium</i>	SCSC	PPPP	PPPP	PPPP	DDDD	DDDD
mat muhly	<i>Muhlenbergia richardsonis</i>	MURI	UUUU	UUUU	UUUU	UUUU	UUUU
Nebraska sedge	<i>Carex nebrascensis</i>	CANE2	PPPP	PPPP	PPPP	DDDD	DDDD
needleandthread	<i>Hesperostipa comata</i>	HECO26	PPPP	PPPP	PPPP	PPPP	PPPP
northern reedgrass	<i>Calamagrostis stricta</i>	CAST13	PPPP	DDDD	PPPP	UUUU	UUUU
Nuttall's alkaligrass	<i>Puccinellia nuttalliana</i>	PUNU2	PPPP	PPPP	PPPP	PPPP	PPPP
plains reedgrass	<i>Calamagrostis montanensis</i>	CAMO	DDDD	DDDD	DDDD	DDDD	DDDD
prairie cordgrass	<i>Spartina pectinata</i>	SPPE	PPPP	DDDD	PPPP	UUUU	UUUU
prairie junegrass	<i>Koeleria macrantha</i>	KOMA	DDDD	DDDD	DDDD	DDDD	DDDD
prairie sandreed	<i>Calamovilfa longifolia</i>	CALO	PPPP	DDDD	PPPP	UUUU	UUUU
reed canarygrass	<i>Phalaris arundinacea</i>	PHAR3	DDDD	UUUU	DDDD	UUUU	UUUU
rush	<i>Juncus</i> spp.	JUNCU	DDDD	UUUU	DDDD	UUUU	UUUU
sand dropseed	<i>Sporobolus cryptandrus</i>	SPCR	DDDD	DDDD	DDDD	UUUU	UUUU
Sandberg bluegrass	<i>Poa secunda</i>	POSE	DDDD	DDDD	DDDD	DDDD	DDDD
slender wheatgrass	<i>Elymus trachycaulus</i>	ELTR7	PPPP	DDDD	PPPP	DDDD	DDDD
spike sedge	<i>Carex nardina</i>	CANA2	DDDD	DDDD	DDDD	UUUU	UUUU
thickspike wheatgrass	<i>Elymus lanceolatus</i>	ELLAL	DDDD	DDDD	DDDD	DDDD	DDDD
threadleaf sedge	<i>Carex filifolia</i>	CAFI	DDDD	DDDD	DDDD	DDDD	PPPP
tufted hairgrass	<i>Deschampsia caespitosa</i>	DECA18	PPPP	PPPP	PPPP	DDDD	DDDD
water sedge	<i>Carex aquatilis</i>	CAAQ	DDDD	UUUU	DDDD	UUUU	UUUU
western wheatgrass	<i>Pascopyrum smithii</i>	PASM	DDDD	DDDD	DDDD	DDDD	DDDD
FORBS							
American licorice	<i>Glycyrrhiza lepidota</i>	GLLE3	UUUU	UUUU	UUUU	UUUU	UUUU
American vetch	<i>Vicia americana</i>	VIAM	PPPP	PPPP	PPPP	PPPP	PPPP
arrowgrass	<i>Triglochin</i> spp.	TRIGL	T	T	T	T	T
asters	<i>Aster</i> spp.	ASTER	UUUU	UUUU	UUUU	UUUU	UUUU
badlands mule-ears	<i>Wyethia scabra</i>	WYSC	UUUU	UUUU	UUUU	UUUU	UUUU
beaked skeletonweed	<i>Shinnersoseris rostrata</i>	SHRO2	UUUU	UUUU	UUUU	UUUU	UUUU
biscuitroots	<i>Lomatium</i> spp.	LOMAT	DDDD	DDDD	UUUU	DDDD	DDDD
blue-eyed grass	<i>Sisyrinchium</i> spp.	SISYR	DDDD	PPPP	DDDD	DDDD	DDDD
breadroot scurfpea	<i>Pediemelum esculentum</i>	PEES	DDDD	DDDD	DDDD	DDDD	DDDD
buttercandle	<i>Cryptantha celosiodes</i>	CRCE	UUUU	UUUU	UUUU	UUUU	UUUU
cattail, broad-leaf	<i>Typha latifolia</i>	TYLA	DDDD	UUUU	DDDD	UUUU	UUUU
cattail, narrow-leaf	<i>Typha angustifolia</i>	TYAN	DDDD	UUUU	DDDD	UUUU	UUUU
desert princesplume	<i>Stanleya pinnata</i>	STPIP	T	T	T	T	T
Douglas' dusty maiden	<i>Chaenactis douglasii</i>	CHDO	UUUU	UUUU	UUUU	UUUU	UUUU
fleabane	<i>Erigeron</i> spp.	ERIGU	UUUU	UUUU	UUUU	UUUU	UUUU
foothills deathcamas	<i>Zigadenus paniculatus</i>	ZIPA2	T	T	T	T	T
fringed sagewort	<i>Artemisia frigida</i>	ARFR4	UUUU	UUUU	UUUU	UUUU	UUUU
green sagewort	<i>Artemisia dracunculus</i>	ARDR4	UUUU	UUUU	UUUU	UUUU	UUUU
hawkbeard	<i>Crepis acuminata</i>	CRAC2	UUUU	PPPP	UUUU	DDDD	DDDD
horsetails	<i>Equisetum</i> spp.	EQUIS	UUUU	UUUU	UUUU	UUUU	UUUU
Indian paintbrush	<i>Castilleja</i> spp.	CASTI2	DDDD	DDDD	DDDD	DDDD	DDDD
iris	<i>Iris</i> spp.	IRIS	UUUU	UUUU	UUUU	UUUU	UUUU
larkspur	<i>Delphinium</i> spp.	DELPH	DDDD	DDDD	DDDD	DDDD	DDDD
licorice-root	<i>Ligusticum</i> spp.	LIGUS	UUUU	UUUU	UUUU	UUUU	UUUU
lupine	<i>Lupinus</i> spp.	LUPIN	DDDD	T	DDDD	DDDD	DDDD
milkvetch	<i>Astragalus</i> spp.	ASTRA	DDDD	DDDD	DDDD	DDDD	DDDD
miner's candle	<i>Cryptantha virgata</i>	CRV14	UUUU	UUUU	UUUU	UUUU	UUUU
mustard	<i>Brassica</i> spp.	BRASS2	UUUU	UUUU	UUUU	UUUU	UUUU
nailwort	<i>Paronychia</i> spp.	PARON	UUUU	UUUU	UUUU	UUUU	UUUU
Nuttall's povertyweed	<i>Monolepis nuttalliana</i>	MONU	UUUU	UUUU	UUUU	UUUU	UUUU
penstemon	<i>Penstemon</i> spp.	PENST	PPPP	PPPP	PPPP	PPPP	PPPP
phlox	<i>Phlox</i> spp.	PHLOX	UUUU	UUUU	UUUU	UUUU	UUUU
plains springparsley	<i>Cymopterus acaulis</i>	CYAC	UUUU	DDDD	UUUU	UUUU	UUUU
poison hemlock	<i>Conium maculatum</i>	COMA2	T	T	T	T	T
prairie bluebells	<i>Mertensia lanceolata</i>	MELA3	DDDD	PPPP	DDDD	DDDD	DDDD
Pursh seepweed	<i>Suaeda calceoliformis</i>	SUCA2	UUUU	UUUU	UUUU	UUUU	UUUU
rosy pussytoes	<i>Antennaria rosea</i>	ANRO2	UUUU	UUUU	UUUU	UUUU	UUUU
sandwort	<i>Arenaria</i> spp.	ARENA	UUUU	UUUU	UUUU	UUUU	UUUU
silverweed cinquefoil	<i>Argentina anserina</i>	ARAN7	UUUU	UUUU	UUUU	UUUU	UUUU
stemless goldenweed	<i>Haplopappus acaulis</i>	HAAC	UUUU	UUUU	UUUU	UUUU	UUUU
sulphur flower buckwheat	<i>Eriogonum umbellatum</i>	ERUM	UUUU	UUUU	UUUU	UUUU	UUUU
tufted evening-primrose	<i>Oenothera caespitosa</i>	OECA10	UUUU	UUUU	UUUU	UUUU	UUUU
twogrooved milkvetch	<i>Astragalus bisulcatus</i>	ASBI2	T	T	T	T	T
water hemlocks	<i>Cicuta</i> spp.	CICUT	T	T	T	T	T
western buttercup	<i>Ranunculus occidentalis</i>	ROAOC	DDDD	DDDD	DDDD	DDDD	DDDD
western dock	<i>Rumex aquaticus</i>	RUAQ	UUUU	UUUU	UUUU	UUUU	UUUU
western yarrow	<i>Achillea lanulosa</i>	ACHIL	UUUU	UUUU	UUUU	UUUU	UUUU
wild onion	<i>Allium textile</i>	ALTE	DDDD	DDDD	DDDD	DDDD	DDDD
woodyaster	<i>Xylorhiza</i> spp.	XYLOR	T	T	T	T	T
woolly plantain	<i>Plantago patagonica</i>	PLPA2	UUUU	UUUU	UUUU	UUUU	UUUU

TREES, SHRUBS & HALF-SHRUBS								
big sagebrush	Artemisia tridentata	ARTR2	UUUU	DDDD	UUUU	DDDD	DDDD	DDDD
birdfoot sagebrush	Artemisia pedatifida	ARPE6	UUUU	UUUU	UUUU	UUUU	UUUU	UUUU
black greasewood	Sarcobatus vermiculatus	SAVE4	DDDD	DDDD	UUUU	DDDD	DDDD	DDDD
black sagebrush	Artemisia nova	ARNO4	DDDD	PPPP	UUUU	PPPP	PPPP	PPPP
broom snakeweed	Gutierrezia sarothrae	GUSA2	UUUU	UUUU	UUUU	UUUU	UUUU	UUUU
bud sagebrush	Picrothamnus desertorum	PIDE4	PPPP	PPPP	DDDD	PPPP	PPPP	PPPP
fourwing saltbush	Atriplex canescens	ATCA2	PPPP	PPPP	PPPP	PPPP	PPPP	PPPP
Gardners saltbush	Atriplex gardneri	ATGA	PPPP	PPPP	DDDD	PPPP	PPPP	PPPP
green rabbitbrush	Chrysothamnus viscidiflorus	CHV18	DDDD	DDDD	DDDD	DDDD	DDDD	DDDD
plains cottonwood (sprouts)	Populus deltoides	PODEM	DDDD	DDDD	DDDD	DDDD	DDDD	DDDD
Rocky Mountain juniper	Juniperus scopulorum	JUSC2	UUUU	UUUU	UUUU	DDDD	UUUU	UUUU
rubber rabbitbrush	Ericameria nauseosa	ERNA10	UUUU	DDDD	UUUU	DDDD	DDDD	DDDD
shadscale saltbush	Atriplex confertifolia	ATCO	UUUU	UUUU	UUUU	UUUU	UUUU	UUUU
shortspine horsebrush	Tetradymia spinosa	TESP2	UUUU	UUUU	UUUU	UUUU	UUUU	UUUU
silver sagebrush	Artemisia cana	ARCAC5	DDDD	DDDD	DDDD	PPPP	PPPP	PPPP
silverberry	Eleagnus commutata	ELCO	UUUU	UUUU	UUUU	DDDD	UUUU	UUUU
skunkbush sumac	Rhus trilobata	RHTR	DDDD	DDDD	DDDD	DDDD	DDDD	DDDD
spiny hopsage	Grayia spinosa	GRSP	UUUU	UUUU	UUUU	UUUU	UUUU	UUUU
Utah juniper	Juniperus osteosperma	JUOS	UUUU	UUUU	UUUU	DDDD	UUUU	UUUU
wax currant	Ribes cereum	RICE	UUUU	UUUU	UUUU	DDDD	DDDD	DDDD
western snowberry	Symphoricarpos occidentalis	SYOC	UUUU	UUUU	UUUU	DDDD	UUUU	UUUU
wildrose	Rosa woodsii var. woodsii	ROWOW	DDDD	DDDD	UUUU	DDDD	DDDD	DDDD
willows	Salix spp.	SALIX	PPPP	PPPP	DDDD	PPPP	UUUU	UUUU
winterfat	Krascheninnikovia lanata	KRLA2	PPPP	PPPP	PPPP	PPPP	PPPP	PPPP
yucca	Yucca glauca	YUGL	DDDD	DDDD	DDDD	DDDD	DDDD	DDDD

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

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)
Historic Climax Plant Community	200-500	.20
Perennial Grasses/Mixed Shrub	150-400	.16
Mixed Shrub/Bare Ground	75-325	.10
Blue Grama Sod	50-150	.05
Salt Tolerant Shrub/Bare Ground	75-275	.07
Salt Tolerant Shrub/Rhizomatous Wheatgrasses	200-425	.16

* - 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	032XY258WY
Sandy	032XY250WY
Loamy	032XY222WY
Saline Upland	032XY244WY
Saline Lowland	032XY238WY

Similar Sites

() – Clayey 10-14" Foothills and Basins East P.Z., R032XY304WY has higher production

Inventory Data References (narrative)

Information presented here has been derived from NRCS inventory data. Field observations from range trained personnel were also used. Those involved in developing this site include: Chris Krassin, Range Management Specialist, NRCS and Everett Bainter, Range Management Specialist, NRCS. 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

Ocular field estimations observed by trained personnel.

State Correlation

This site occurs entirely within Wyoming.

Type Locality

Field Offices

Casper, Lander, Riverton, Fort Washakie, Dubois

Relationship to Other Established Classifications

Other References

Site Description Approval

State Range Management Specialist

Date