United States Department of Agriculture
Natural Resources Conservation Service

Ecological Site Description

Site Type: Rangeland

Site Name: Overflow (Ov) 10-14" Foothills and Basins East Precipitation Zone,

Site ID: R032XY330WY

Major Land Resource Area: 32 – Northern Intermountain Desertic Basins

Physiographic Features

This site is located on nearly level land and either adjacent to streams that run water at least during the major part of the growing season or on alluvial fans adjacent to toe slopes or foothills.

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

	Minimum	Maximum
Elevation (feet):	5400	7500
Slope (percent):	0	30
Water Table Depth (inches):	>60	30
Flooding:		
Frequency:	None	occasional
Duration:	None	brief
Ponding:		
Depth (inches):	0	0
Frequency:	None	rare
Duration:	None	brief
Runoff Class:	negligible	low

Climatic Features

Annual precipitation ranges from 10-14 inches per year. The normal precipitation pattern shows the least amount of precipitation in December, January, and February, increasing to a peak during the latter part of May. Amounts decrease through June, July, and August and then increase some in September. 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 exceeds 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.

Winds are generally not strong as compared to the rest of the state. Daytime winds are generally stronger than nighttime and occasional strong storms may bring brief periods of high winds with gusts to more than 75 mph.

Growth of native cool-season plants begins about April 15 and continues to about July 15. 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 "Thermopolis 2" climate station:

	Minimum	Maximum	5 yrs. out of 10 between
Frost-free period (days):	74	149	May 23 – September 16
Freeze-free period (days):	112	180	May 8 – October 1
Annual Precipitation (inches):	7.6	21.9	

Mean annual precipitation: 12.35 inches
Mean annual air temperature: 46.2 °F (30.1°F Avg. Min. to 62.3°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" Grass Creek 1E", "Thermopolis", Thermopolis 25NW", "Buffalo Bill Dam" and "Black Mountain".

Influencing Water Features

Wetland Description:	System	Subsystem	Class	Sub-class
None	None	None	None	None

Stream Type: None

Representative Soil Features

The soils of this site are very deep to moderately deep (greater than 20" to bedrock), moderately well to well-drained that formed in alluvium or alluvium over residuum. These soils have moderately slow to moderately rapid permeability. The soil characteristic having the most influence on the plant community is the additional available moisture. These areas receive additional water from overflow of intermittent streams or runoff from adjacent slopes.

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

Parent Material Kind: alluvium and residuum
Parent Material Origin: sandstone, shale
Surface Texture: loam, fine sandy loam, sandy loam
Surface Texture Modifier: none is most common but gravelly may occur
Subsurface Texture Group: loam, sandy clay loam, clay loam, silty clay, sandy loam
Surface Fragments ≤ 3" (% Cover): 0, occasionally up to10
Surface Fragments > 3" (%Cover): 0
Subsurface Fragments ≤ 3" (% Volume): typically 0, occasionally up to 15
Subsurface Fragments > 3" (% Volume): typically 0, occasionally up to 10

	Minimum	Maximum
Drainage Class:	moderately well drained	well drained
Permeability Class:	moderately slow	moderate
Depth (inches):	20	>60
Electrical Conductivity (mmhos/cm) ≤20":	0	8
Sodium Absorption Ratio ≤20":	0	13
Soil Reaction (1:1 Water) ≤20":	7.4	9.0
Soil Reaction (0.1M CaCl2) ≤20":	NA	NA
Available Water Capacity (inches) ≤30":	3.0	6.3
Calcium Carbonate Equivalent (percent) ≤20":	0	20

Plant Communities

Ecological Dynamics of the Site:

Potential vegetation on this site is dominated by tall and mid cool-season perennial grasses. Other significant vegetation includes basin big sagebrush, silver sagebrush, rubber rabbitbrush, and a variety of forbs. The expected potential composition for this site is about 80% grasses, 10% forbs and 10% woody plants. The composition and production will vary naturally due to historical use, fluctuating precipitation and fire frequency.

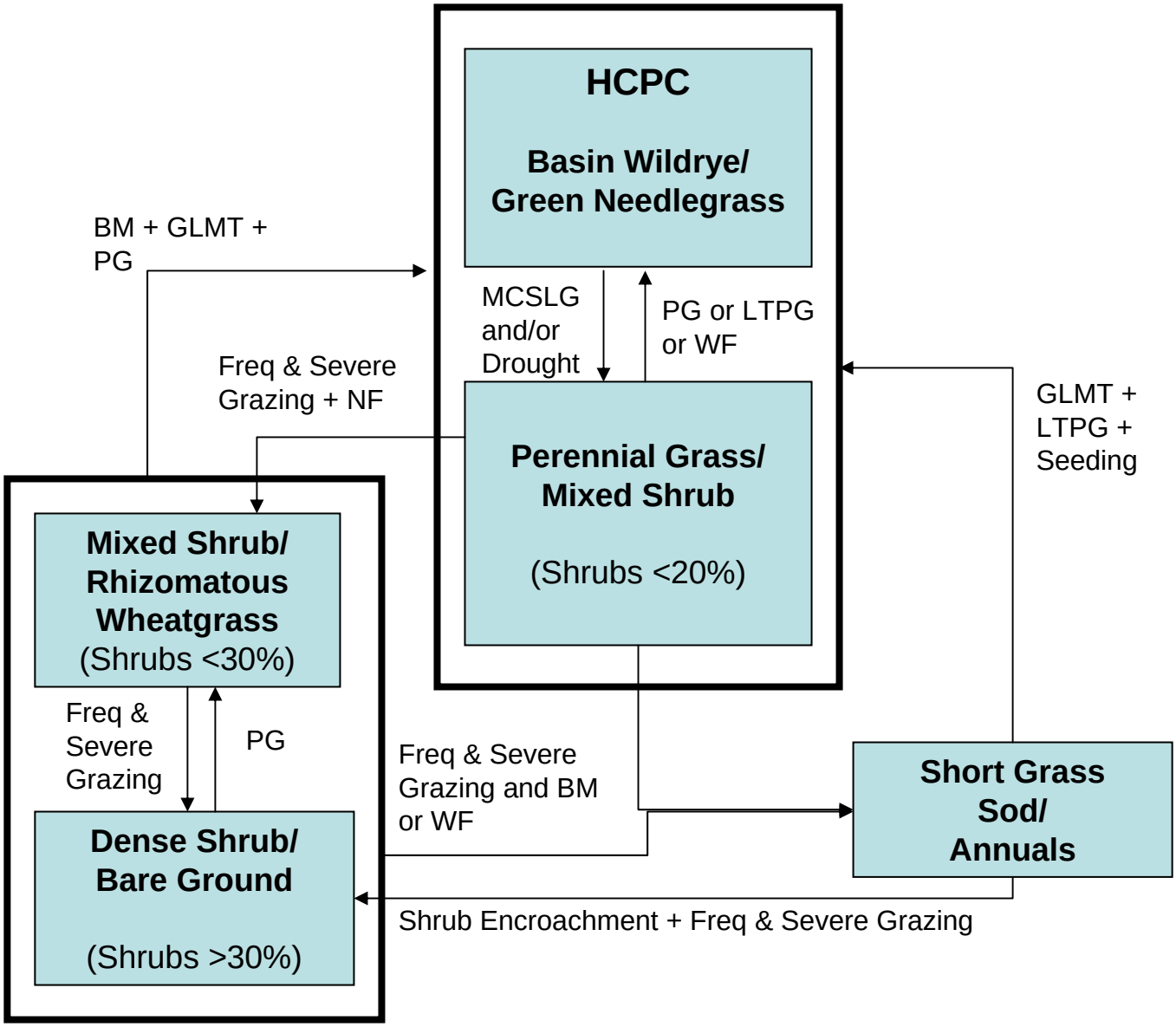
As this site deteriorates species such as rhizomatous wheatgrasses, Sandberg bluegrass, basin big sagebrush, and silver sagebrush will increase. Plains pricklypear and weedy annuals will invade. Cool-season grasses such as, basin wildrye, green needlegrass, slender wheatgrass, needleandthread, and Indian ricegrass will decrease in frequency and production.

Typically, many of these overflow sites have been altered or modified, due to its productive features and proximate to water. Consequently, basin big sagebrush, which is tied ecologically to these sites, has lost much of its original habitat. As basin big sagebrush is not a resilient plant, once removed it will require many years before the stand can be replace. Some stands may never be replaced, if a vigorous stand of grass exists and is maintained.

In some instances, basin big sagebrush may become dominant on areas with an absence of fire and sufficient amount of overflow. If treatment of a stand is necessary, thinning is usually preferred instead of total removal. This can be accomplished by chemical, mechanical or closely monitored burning.

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) Total: 1800		
			Group	lbs./acre	% Comp.
GRASSES AND GRASS-LIKES					
GRASSES/GRASSLIKES					
Basin wildrye	Leymus cinereus	LECI4	1	270 - 540	15 - 30
Green needlegrass	Nassella viridula	NAVI4	2	270 - 540	15 - 30
Needleandthread grass	Hesperostipa comata	HECO26	3	180 - 360	10 - 20
Western wheatgrass	Pascopyrum smithii	PASM	4	90 - 270	5 - 15
Slender wheatgrass	Elymus trachycaulus	ELTR7	5	0 - 180	0 - 10
Indian ricegrass	Achnatherum hymenoides	ACHY	6	0 - 90	0 - 5
MISC. GRASSES/GRASSLIKES			**7**	**0 - 270**	**0 - 15**
Big bluegrass	Poa ampla (syn. to Poa secunda)	POAM (POSE	7	0 90	0 5
Bottlebrush squirreltail	Elymus elymoides	ELEL5	7	0 - 90	0 - 5
Canby bluegrass	Poa canbyi (syn. P. secunda)	POCA(POSE)	7	0 - 90	0 - 5
Prairie junegrass	Koeleria macrantha	KOMA	7	0 - 90	0 - 5
Sandberg bluegrass	Poa secunda	POSE	7	0 - 90	0 - 5
other perennial grasses (native)		2GP	7	0 - 90	0 - 5
FORBS			**8**	**0 - 180**	**0 - 10**
Bigseed biscuitroot	Lomatium macrocarpum	LOMA3	8	0 - 90	0 - 5
False carrot	Turgenia spp.	TURGE	8	0 - 90	0 - 5
Fleabane	Erigeron spp.	ERIGE2	8	0 - 90	0 - 5
Fringed sagewort	Artemisia frigida	ARFR4	8	0 - 90	0 - 5
Goldenweed	Stenotus acaulis	STAC	8	0 - 90	0 - 5
Larkspur	Delphinium spp.	DELPH	8	0 - 90	0 - 5
Paintbrush	Castilleja spp.	CAST	8	0 - 90	0 - 5
Parsnipflower buckwheat	Eriogonum heracleoides	ERHE2	8	0 - 90	0 - 5
Penstemon	Penstemon spp.	PENST	8	0 - 90	0 - 5
Phlox	Phlox spp.	PHLOX	8	0 - 90	0 - 5
Scarlet globemallow	Sphaeralcea coccinea	SPCO	8	0 - 90	0 - 5
Tapertip hawksbread	Crepis acuminata	CRAC2	8	0 - 90	0 - 5
Wild onion	Allium textile	ALTE	8	0 - 90	0 - 5
other perennial forbs (native)		2FP	8	0 - 90	0 - 5
TREES/SHRUBS			**9**	**0 - 180**	**0 - 10**
Basin big sagebrush	Artemisia tridentata tridentata	ARTRT	9	0 - 90	0 - 5
Rubber rabbitbrush	Ericameria nauseosa	ERNA10	9	0 - 90	0 - 5
Silver sagebrush	Artemisia cana	ARCA13	9	0 - 90	0 - 5
Snowberry	Symphoricarpus occidentalis	SYOC	9	0 - 90	0 - 5
other shrubs & half shrubs (native)		2SHRUB	9	0 - 90	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.

Basin Wildrye/Green Needlegrass Plant Community

This plant community is the interpretive plant community for this site and is considered to be the Historic Climax Plant Community (HCPC). This state evolved with grazing by large herbivores, additional overflow moisture, and periodic fires. The cyclical natural of the fire regime in this community prevented 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 periods of rest. The potential vegetation is about 80% grasses or grass-like plants, 10% forbs, and 10% woody plants. Cool season tall and mid-grasses dominate this state.

The major grasses include basin wildrye, green needlegrass, slender wheatgrass, rhizomatous wheatgrasses, needleandthread, and Indian ricegrass. Other grasses occurring in this state include bottlebrush squirreltail, prairie junegrass, and Sandberg bluegrass. Basin big sagebrush, silver sagebrush, and rubber rabbitbrush stands are conspicuous elements of this state and occur in a mosaic pattern. 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 1800 lbs./acre, but it can range from about 1200 lbs./acre in unfavorable years to about 2400 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	5	20	30	20	10	15	0	0	0

(Monthly percentages of total annual growth)

This plant community is stable and well adapted to the Northern Intermountain Desertic Basins 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:

- Moderate, continuous season-long grazing will convert the plant community to the *Perennial Grass/Mixed Shrub Plant Community.* Prolonged drought will exacerbate this transition.

Perennial Grass/Mixed Shrub Plant Community
Historically, this plant community evolved under grazing and a low fire frequency. Currently, it is found under moderate, season-long grazing by livestock and will be exacerbated by prolonged drought conditions. In addition, the fire regime for this site has been modified and extended periods without fire is now common. This plant community is still dominated by cool-season grasses, while short warm-season grasses and miscellaneous forbs account for the balance of the understory. Basin big sagebrush, silver sagebrush, and rubber rabbitbrush are now conspicuous parts of the overall production.

The dominant grasses include green needlegrass, slender wheatgrass, rhizomatous wheatgrasses, and needleandthread. Grasses and grass-like species of secondary importance include bottlebrush squirreltail, prairie junegrass, blue grama, Sandberg bluegrass and threadleaf sedge. Forbs commonly found in this plant community include scarlet globemallow, fringed sagewort, wavyleaf paintbrush, little larkspur, and Hood's phlox. Basin big sagebrush along with silver sagebrush and rubber rabbitbrush can make up to 20% of the annual production. The overstory of shrubs and understory of grass and forbs provide a diverse plant community.

When compared to the Historic Climax Plant Community, shrubs and rhizomatous wheatgrasses have increased. Plains pricklypear cactus will also have invaded, but occurs only in small patches. Basin wildrye and Indian ricegrass have decreased and may occur in only trace amounts under the shrub canopy or within the patches of pricklypear. Total production has decreased, but the increase of shrubs has offset some of this loss.

The total annual production (air-dry weight) of this state is about 1500 pounds per acre, but it can range from about 1000 lbs./acre in unfavorable years to about 2000 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	5	20	30	20	10	15	0	0	0

(Monthly percentages of total annual growth)

This plant community is resistant to change. The herbaceous species present are 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.

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 *HCPC*. The probability of this occurring is high especially if rotational grazing along with short deferred grazing is implemented as part of the 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, but close monitoring is advised to make sure total removal of basin big sagebrush is avoided.

- Frequent and severe grazing plus no fire, will convert the plant community to the *Mixed Shrub/Rhizomatous Wheatgrass Plant Community*. The probability of this occurring is high. This is especially evident on areas where shrub stands are not adversely impacted by drought, heavy use or the occasional wildfires.

- Frequent and severe grazing (yearlong grazing) plus wildfire or brush control, will convert the plant community to the *Short Grass Sod/Annuals Plant Community.* The probability of this occurring is high, especially, if the sagebrush stand has been severely affected by drought or heavy use or has been removed altogether.

Mixed Shrub/Rhizomatous Wheatgrass Plant Community
This plant community is the result of frequent and severe grazing and protection from fire. This improper grazing has negatively affected the tall and some of the mid perennial grasses. Most of the preferred cool season grasses have been reduced. Shrubs such as basin and silver sagebrush and rubber rabbitbrush account for up to one-third of the total production of this plant community.

The dominant grasses are rhizomatous wheatgrasses, prairie junegrass, Sandberg bluegrass, threadleaf sedge, and blue grama. Weedy annual species such as cheatgrass may occur in patches if a seed source is available. Cactus and sageworts often increase. The interspaces between plants have expanded leaving the amount of bare ground more prevalent. As compared with the HCPC or the Perennial Grass/Mixed Shrub Plant Communities, the annual production is less, but the increase in shrub and rhizomatous wheatgrass production compensates for some of the loss of the tall and mid perennial grass production.

The total annual production (air-dry weight) of this state is about 1200 pounds per acre, but it can range from about 800 lbs./acre in unfavorable years to about 1600 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	5	20	30	20	10	15	0	0	0

(Monthly percentages of total annual growth)

This plant community is relatively resistant to change as the stand becomes more decadent, although continued improper grazing can eventually lead to the reduction in the rhizomatous wheatgrasses and increase the dominance of shrubs. These areas may actually become more resistant to fire as less fine fuels are available and the bare ground between the sagebrush plants is increased. Plant diversity is moderate. 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.

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

- Brush management and/or grazing land mechanical treatment (seeding, etc.) and pricklypear cactus control (if needed), followed by prescribed grazing, will return this plant community to near *Historic Climax Plant Community* condition. If treatment of a stand is necessary, thinning is usually preferred instead of total removal. This can be accomplished by chemical, mechanical or closely monitored burning. Close monitoring is advised to make sure total removal of basin big sagebrush is avoided. If prescribed fire is used, 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. Seeding of native grasses is generally recommended after fire if these grasses have been removed or a seed source is not available.

- Frequent and severe grazing plus no wildfire will result in the *Dense Shrub/Bare Ground Plant Community*.

- Wildfire or brush management and/or frequent and severe grazing (yearlong), will convert the plant community to the *Short Grass Sod/Annuals Plant Community*.

Dense Shrub/Bare Ground Community
This plant community is the result of frequent and severe grazing and protection from fire. Basin big sagebrush usually dominates this plant community with the occasional heavy patches of silver sagebrush and rubber rabbitbrush. However, on sites which have burned or the basin big sagebrush removed, silver sagebrush and rubber rabbitbrush will now dominate. The annual production of shrubs exceeds 30% of the total production and usually is much higher. Most of the preferred cool season grasses have been greatly reduced or eliminated.

The dominant grasses/grasslikes are rhizomatous wheatgrasses, prairie junegrass, Sandberg bluegrass, threadleaf sedge, and blue grama. Weedy annual species such as cheatgrass may occupy the site 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 if a seed source is available. The interspaces between plants have expanded leaving the amount of bare ground more prevalent. As compared with the HCPC or the Perennial Grass/Mixed Shrub Plant Communities, the annual production is less, but the shrub production compensates for some of the decline in the herbaceous production.

The total annual production (air-dry weight) of this state is about 800 pounds per acre, but it can range from about 500 lbs./acre in unfavorable years to about 1000 lbs./acre in above average years.

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	5	20	30	20	10	15	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. The exception is if cheatgrass has become a major part of this

community, which can result in an increase in the frequency of fires. Continued frequent and severe grazing or the removal of grazing does not seem to affect the composition or structure of the plant community unless the shrub component is being lost by trampling. Plant diversity is moderate to poor. 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.

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

- Brush management and/or grazing land mechanical treatment (seeding, etc.) and pricklypear cactus control (if needed), followed by prescribed grazing, will return this plant community to near *Historic Climax Plant Community* condition. If treatment of a stand is necessary thinning is usually preferred instead of total removal. This can be accomplished by chemical, mechanical or closely monitored burning. Close monitoring is advised to make sure total removal of basin big sagebrush is avoided. If prescribed fire is used, 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. Seeding of native grasses is generally recommended after fire if these grasses have been removed or a seed source is not available.

- Prescribed Grazing will convert this plant community to a *Mixed Shrub/Rhizomatous Wheatgrass Plant Community*.

- Wildfire or brush management and/or frequent and severe grazing (yearlong), will convert the plant community to the *Short Grass Sod/Annuals Plant Community*.

Short Grass Sod/Annuals Plant Community
This plant community is the result of frequent and severe yearlong grazing, which has adversely affected the perennial grasses as well as the addition of other impacts that can affect the shrub component. These factors include drought and wildfires, trampling, and human brush control measures. Annual grasses and forbs along with areas of a dense sod of short grass dominate this state. Pricklypear cactus can become dense enough in patches so that livestock cannot graze forage growing within the cactus clumps. Basin big and silver sagebrush have been reduced to small patches or in some cases removed. Rubber rabbitbrush may be the sole remaining shrub.

Weedy annual species occupy the site and can even dominate. These annuals include cheatgrass, mustards and stickseed. Noxious weeds such as Russian knapweed, leafy spurge, or Canada thistle may invade the site if a seed source is available and can occupy large patches.

When compared to the Historic Climax Plant Community, blue grama, threadleaf sedge have increased and pricklypear and weedy annuals have invaded. All cool-season tall and 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 500 pounds per acre, but it can range from about 300 lbs./acre in unfavorable years to about 800 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	5	20	30	20	10	15	0	0	0

(Monthly percentages of total annual growth)

The vegetation is resistant to change and continued improper grazing does not affect the vegetative structure. The biotic integrity of this state is not functional and plant diversity is extremely low. The plant vigor is significantly weakened and replacement capabilities are limited due to the absences of cool-season grasses.

This plant community is resistant to water infiltration on the sod occupied sites. While this sod protects the site itself, un-sodded areas are affected by excessive runoff that can cause rills and gully erosion. Water flow patterns are obvious in the bare ground areas and pedestalling is apparent along the sod edges. Rill channels are noticeable in the interspaces and down slope. The watershed may or may not be functioning, as runoff may affect adjoining sites.

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

- Grazing land mechanical treatment (seeding, chiseling, etc.) and pricklypear cactus control (if needed), followed by long term prescribed grazing, may eventually return this plant community to near *Historic Climax Plant Community* condition.

- Shrub encroachment and continued severe and frequent grazing will result in the *Dense Shrub/Bare Ground Plant Community*.

Ecological Site Interpretations

Animal Community – Wildlife Interpretations

Basin Wildrye/Green Needlegrass (HCPC): The predominance of grasses in this plant community favors grazers and mixed-feeders, such as bison, elk, deer, 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 shrubs and an understory of grasses and forbs plus it proximity to water 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 hosts of other nesting birds utilize stands in the 20-30% cover range.

Mixed Shrub/Rhizomatous Wheatgrass Plant Community: The combination of an overstory of shrubs and an understory of grasses and forbs plus it proximity 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 hosts of other nesting birds utilize stands in the 20-30% cover range.

Dense 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 adequate escape and thermal cover for large ungulates, as well as nesting habitat for upland game birds including sage grouse.

Short Grass Sod/Annuals 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 Perennial Grass/Mixed Shrub Plant Community is limiting. Generally, these are not target plant communities for wildlife habitat management.

Animal Preferences (Quarterly - 1,2,3,4) for commonly occuring plants in MLRA 32, 10-14 inch Foothills and Basins East

COMMON NAME/ GROUP NAME	SCIENTIFIC NAME	SCIENTIFIC SYMBOL	*Cattle*	*Sheep*	*Horses*	*Mule Deer*	*Antelope*	*Elk*	*Moose*	*Mtn. Sheep*
GRASSES/GRASSLIKES										
Alkali bluegrass	Poa juncifolia (syn. P. secunda)	POJU (POSE)	DDDD	PPPP	DDDD	PPPP	PPPP	DDDD	DDDD	DDDD
Alkali cordgrass	Spartina gracilis	SPGR	DDDD	UUUU	DDDD	UUUU	UUUU	DDDD	DDDD	UUUU
Alkali sacaton	Sporobolus airoides	SPAI	PPPP	DDDD	PPPP	DDDD	DDDD	PPPP	DDDD	DDDD
Baltic rush	Juncus balticus	JUBA	DDDD	UUUU	DDDD	UUUU	UUUU	DDDD	UUUU	UUUU
Basin wildrye	Leymus cinereus	LECI4	PPPP	PPPP	PPPP	DDDD	DDDD	PPPP	DDDD	PPPP
Big bluegrass	Poa Ampla (syn. P. secunda)	POAM (POSE)	PPPP	PPPP	PPPP	PPPP	PPPP	PPPP	PPPP	PPPP
Blue grama	Bouteloua gracilis	BOGR2	DDDD	DDDD	DDDD	DDDD	DDDD	DDDD	DDDD	DDDD
Bluebunch wheatgrass	Pseudoroegneria spicata	PSSP6	PPPP	PPPP	PPPP	DDDD	DDDD	PPPP	PPPP	DDDD
Bluejoint reedgrass	Calamagrostis canadensis	CACAM	PPPP	DDDD	PPPP	UUUU	UUUU	PPPP	DDDD	DDDD
Bottlebrush squirreltail	Elymus elymoides	ELELE	DDDD	DDDD	DDDD	DDDD	DDDD	DDDD	DDDD	DDDD
Bulrush	Scripus spp.	SCIRP	DDDD	UUUU	DDDD	UUUU	UUUU	DDDD	DDDD	DDDD
Canada wildrye	Elymus canadensis	ELCA4	PPPP	PPPP	PPPP	DDDD	DDDD	PPPP	PPPP	PPPP
Canby bluegrass	Poa canbyi (syn. to Poa secunda)	POCA (POSE)	PPPP	PPPP	PPPP	PPPP	PPPP	PPPP	PPPP	PPPP
Golden sedge	Carex aurea	CAAU3	DDDD	DDDD	DDDD	UUUU	UUUU	DDDD	UUUU	DDDD
Green needlegrass	Nassella viridula	NAVI4	PPPP	PPPP	PPPP	PPPP	PPPP	PPPP	PPPP	PPPP
Indian ricegrass	Achnatherum hymenoides	ACHY	PPPP	PPPP	PPPP	PPPP	PPPP	PPPP	PPPP	PPPP
Inland saltgrass	Distichlis spicata	DISP	UUUU	UUUU	UUUU	UUUU	UUUU	UUUU	UUUU	UUUU
Inland sedge	Carex interior	CAIN11	DDDD	DDDD	DDDD	UUUU	UUUU	DDDD	DDDD	DDDD
Mat muhly	Muhlenbergia richardsonis	MURI	UUUU	UUUU	UUUU	UUUU	UUUU	UUUU	UUUU	UUUU
Griffith's wheatgrass	Elymus albicans	ELAL7	DDDD	DDDD	DDDD	DDDD	DDDD	DDDD	DDDD	DDDD
Nebraska sedge	Carex nebrascensis	CANE2	PPPP	PPPP	PPPP	DDDD	DDDD	PPPP	DDDD	DDDD
Needleandthread	Hesperostipa comata	HECO26	PPPP	PPPP	PPPP	PPPP	PPPP	PPPP	PPPP	PPPP
Nuttall's alkaligrass	Puccinellia nuttalliana	PUNU2	PPPP	PPPP	PPPP	PPPP	PPPP	PPPP	PPPP	PPPP
Prairie junegrass	Koeleria macrantha	KOMA	DDDD	DDDD	DDDD	DDDD	DDDD	DDDD	DDDD	DDDD
Prairie sandreed	Calamovilfa longifolia	CALO	PPPP	DDDD	PPPP	UUUU	UUUU	PPPP	DDDD	DDDD
Sandberg bluegrass	Poa secunda	POSE	DDDD	DDDD	DDDD	DDDD	DDDD	DDDD	DDDD	DDDD
Sand dropseed	Sporobolus cryptandrus	SPCR	DDDD	DDDD	DDDD	UUUU	UUUU	DDDD	UUUU	UUUU
Slender wheatgrass	Elymus trachycaulus	ELTR7	PPPP	DDDD	PPPP	DDDD	DDDD	PPPP	DDDD	DDDD
Slough sedge	Carex obnupta	CAOB3	DDDD	DDDD	DDDD	DDDD	DDDD	DDDD	DDDD	DDDD
Spike fescue	Leucopa kingii	LEKI2	PPPP	DDDD	PPPP	PPPP	DDDD	PPPP	DDDD	DDDD
Streambank wheatgrass	Elymus lanceolatus	ELLAL3	DDDD	DDDD	DDDD	DDDD	DDDD	DDDD	DDDD	DDDD
Thickspike wheatgrass	Elymus lanceolatus	ELLAL3	DDDD	DDDD	DDDD	DDDD	DDDD	DDDD	DDDD	DDDD
Threadleaf sedge	Carex filifolia	CAFI	DDDD	DDDD	DDDD	DDDD	PPPP	DDDD	DDDD	DDDD
Tufted hairgrass	Deschampsia caespitosa	DECA18	PPPP	PPPP	PPPP	DDDD	DDDD	PPPP	DDDD	DDDD
Upland sedges	Carex spp.	CAREX	DDDD	DDDD	DDDD	DDDD	DDDD	DDDD	DDDD	DDDD
Water sedge	Carex aquatilis	CAAQ	DDDD	DDDD	DDDD	DDDD	DDDD	DDDD	DDDD	DDDD
Western wheatgrass	Pascopyrum smithii	PASM	DDDD	DDDD	DDDD	DDDD	DDDD	DDDD	DDDD	DDDD
FORBS										
Alkali seepweed	Suaeda vera	SUVE2	UUUU	UUUU	UUUU	UUUU	UUUU	UUUU	UUUU	UUUU
American bistort	Polygonum bistortoides	POB16	DDDD	DDDD	DDDD	DDDD	DDDD	DDDD	DDDD	DDDD
Arrowgrass	Triglochin spp.	TRIGL	TTTT	TTTT	TTTT	TTTT	TTTT	TTTT	TTTT	TTTT
Asters	Eucephalus spp.	EUCEP2	UUUU	UUUU	UUUU	UUUU	UUUU	UUUU	UUUU	UUUU
Biscuitroots	Lomatium spp.	LOMAT	DDDD	DDDD	UUUU	DDDD	DDDD	DDDD	DDDD	DDDD
Cinquefoil	Potentilla spp.	POTEN	UUUU	UUUU	UUUU	UUUU	UUUU	UUUU	UUUU	UUUU
Deathcamas	Zigadenus Michx.	ZIGAD	TTTT	TTTT	TTTT	TTTT	TTTT	TTTT	TTTT	TTTT
Dock	Rumex spp.	RUMEX	UUUU	UUUU	UUUU	UUUU	UUUU	UUUU	UUUU	UUUU
Evening primrose	Oenothera caespitosa	OECA10	UUUU	UUUU	UUUU	UUUU	UUUU	UUUU	UUUU	UUUU
False carrot	Turgenia spp.	TURGE	UUUU	DDDD	UUUU	UUUU	UUUU	UUUU	UUUU	DDDD
Fleabanes	Erigeron spp.	ERIGE2	DDDD	DDDD	DDDD	DDDD	DDDD	DDDD	DDDD	DDDD
Fringed sagewort	Artemisia frigida	ARFR4	UUUU	UUUU	UUUU	UUUU	DDDD	UUUU	UUUU	UUUU
Goldenweed	Stenotus acaulis	STAC	UUUU	UUUU	UUUU	UUUU	UUUU	UUUU	UUUU	UUUU
Gromwell	Buglossoides arvensis	BUAR3	UUUU	UUUU	UUUU	UUUU	UUUU	UUUU	UUUU	UUUU
Hawksbeard	Crepis acuminata	CRAC2	UUUU	PPPP	UUUU	DDDD	DDDD	UUUU	DDDD	DDDD
Horsetails	Equisetum spp.	EQUIS	UUUU	UUUU	TTTT	UUUU	UUUU	UUUU	UUUU	UUUU
Iris	Iris spp.	IRIS	UUUU	UUUU	UUUU	UUUU	UUUU	UUUU	UUUU	UUUU
Larkspur	Delphinium spp.	DELPH	DDDD	DDDD	DDDD	DDDD	DDDD	DDDD	DDDD	DDDD
Milkvetch	Astragalus spp.	ASTRA	DDDD	DDDD	DDDD	DDDD	DDDD	DDDD	DDDD	DDDD
Paintbrush	Castilleja spp.	CAST	DDDD	DDDD	DDDD	DDDD	DDDD	DDDD	DDDD	DDDD
Penstemons	Penstemon spp.	PENST	PPPP	PPPP	PPPP	PPPP	PPPP	PPPP	PPPP	PPPP
Phlox	Phlox spp.	PHLOX	UUUU	UUUU	UUUU	UUUU	UUUU	UUUU	UUUU	UUUU
Prairie thermopsis	Thermopsis rhombifolia	THRH	UUUU	UUUU	UUUU	UUUU	UUUU	UUUU	UUUU	UUUU
Princesplume	Stanleya spp.	STANL	TTTT	TTTT	TTTT	TTTT	TTTT	TTTT	TTTT	TTTT
Nuttalll's povertyweed	Monoepis nuttalliana	MONU	UUUU	UUUU	UUUU	UUUU	UUUU	UUUU	UUUU	UUUU
Pussytoes	Antennaria spp.	ANTEN	UUUU	UUUU	UUUU	UUUU	UUUU	UUUU	UUUU	UUUU
Salsify	Tragopogon porrifolius	TRPO	UUUU	UUUU	UUUU	UUUU	UUUU	UUUU	UUUU	UUUU
Scarlet globemallow	Sphaeralcea coccinea	SPCO	DDDD	DDDD	DDDD	DDDD	DDDD	DDDD	DDDD	DDDD
Stemless hymenoxys	Tetraneuris acaulis	TEACA2	UUUU	UUUU	UUUU	UUUU	UUUU	UUUU	UUUU	UUUU
Wild onion	Allium textile	ALTE	DDDD	DDDD	DDDD	DDDD	DDDD	DDDD	DDDD	DDDD
Winterfat	Krascheninnikovia lanata	KRAL2	PPPP	PPPP	PPPP	PPPP	PPPP	PPPP	PPPP	PPPP
Woody aster	Xylorhiza spp.	XYLOR	TTTT	TTTT	TTTT	TTTT	TTTT	TTTT	TTTT	TTTT
Wooly groundsel	Packera cana	PACA15	TTTT	UUUU	TTTT	UUUU	UUUU	TTTT	UUUU	UUUU
TREES, SHRUBS & HALF-SHRUBS										
Antelope bitterbrush	Purshia tridentata	PUTR2	PPPP	PPPP	DDDD	PPPP	PPPP	PPPP	PPPP	PPPP
Boxelder	Acer negundo L. var. interius	ACNE12	UUUU	UUUU	UUUU	UUUU	UUUU	UUUU	UUUU	UUUU
Silver sagebrush	Artemisia cana	ARCA13	DDDD	DDDD	DDDD	PPPP	PPPP	DDDD	DDDD	DDDD
Big sagebrush	Artemisia tridentata	ARTR2	DDDD	DDDD	UUUU	DDDD	DDDD	DDDD	DDDD	DDDD
Birdfoot sagebrush	Artemisia pedatifida	ARPE6	UUUU	UUUU	UUUU	UUUU	UUUU	UUUU	UUUU	UUUU
Black sagebrush	Artemesia nova	ARNO4	UUUU	PPPP	UUUU	PPPP	PPPP	UUUU	UUUU	DDDD
Cottonwoods (sprouts)	Populus spp.	POPUL	DDDD	DDDD	DDDD	DDDD	UUUU	DDDD	DDDD	UUUU
Curlleaf mountainmahogany	Cercocarpus ledifolius	CELE3	PPPP	PPPP	DDDD	PPPP	UUUU	PPPP	PPPP	DDDD
Gardners saltbush	Atriplex gardneri	ATGA	PPPP	PPPP	DDDD	PPPP	PPPP	PPPP	DDDD	DDDD
Greasewood	Sarcobatus vermiculatus	SAVE4	DDDD	DDDD	UUUU	DDDD	DDDD	DDDD	UUUU	UUUU
Green rabbitbrush	Chrysothamnus viscidiflorus	CHVI8	PPPP	DDDD	PPPP	PPPP	PPPP	PPPP	DDDD	DDDD
Limber pine	Pinus flexilis	PIFL2	UUUU	UUUU	UUUU	UUUU	UUUU	UUUU	UUUU	UUUU
Rubber rabbitbrush	Ericameria nauseosa	ERNA10	UUUU	PPPP	UUUU	DDDD	PPPP	UUUU	UUUU	DDDD
Rocky Mountain juniper	Juniperus scopulorum	JUSC2	UUUU	UUUU	UUUU	DDDD	UUUU	UUUU	UUUU	UUUU
Shadscale	Atriplex confertifolia	ATCO	UUUU	UUUU	UUUU	UUUU	UUUU	UUUU	UUUU	UUUU
Shrubby cinquefoil	Dasiphora floribunda	DAFL3	UUUU	UUUU	UUUU	UUUU	UUUU	UUUU	DDDD	UUUU
Silver buffaloberry	Shepherdia argentea	SHAR	UUUU	UUUU	UUUU	UUUU	UUUU	UUUU	UUUU	UUUU
skunkbush sumac	Rhus trilobata	RHTR	DDDD	DDDD	DDDD	DDDD	DDDD	DDDD	UUUU	UUUU
Snowberry	Symphoricarpus occidentalis	SYOC	UUUU	UUUU	UUUU	DDDD	UUUU	UUUU	UUUU	UUUU
Utah juniper	Juniperus osteosperma	JUOS	UUUU	UUUU	UUUU	DDDD	UUUU	UUUU	UUUU	UUUU
Wildrose	Rosa woodsii var. woodsii	ROWOW	DDDD	DDDD	UUUU	DDDD	DDDD	DDDD	DDDD	DDDD
Willows	Salix spp.	SALIX	PPPP	PPPP	DDDD	PPPP	UUUU	PPPP	PPPP	DDDD
Winterfat	Krascheninnikovia lanata	KRAL2	PPPP	PPPP	PPPP	PPPP	PPPP	PPPP	PPPP	PPPP
Yucca	Yucca spp.	YUCCA	DDDD	DDDD	UUUU	DDDD	DDDD	DDDD	UUUU	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)
Basin Wildrye/Green Needlegrass	1200-2400	.60
Perennial Grass/Mixed Shrub	1000-2000	.50
Mixed Shrub/Rhizomatous Wheatgrass	800-1600	.25
Dense Shrub/Bare Ground	500-1000	.20
Short Grass Sod/Annuals	300-800	.15

* - 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 B and C, with localized areas in hydrologic group D. Infiltration ranges from moderately slow to moderate. Runoff potential for this site varies from low to moderate 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 hydrology 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 varieties of plants which bloom from spring until fall have an esthetic value that appeals to visitors.

Wood Products
No appreciable wood products are present on the site.

Other Products
None noted.

Supporting Information

Associated Sites

Loamy	R032XY322WY
Sandy	R032XY350WY
Clayey	R032XY304WY
Lowland	R032XY328WY

Similar Sites
None Noted

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 Everet Bainter, Range Management Specialist. Other sources used as references include USDA NRCS Water and Climate Center, USDA NRCS National Range and Pasture Handbook, USDI and USDA Interpreting Indicators of Rangeland Health Version 3, 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, Cody, Dubois, Fort Washakie, Greybull, Lander, Powell, Riverton, Thermopolis, Worland,

Relationship to Other Established Classifications

Other References

Site Description Approval

_____ _____
State Range Management Specialist Date