USDA Natural Resources Conservation Service

Ecological site R032XY258WY
Shallow Clayey (SwCy) 5-9” Wind River Basin Precipitation Zone

Accessed: 05/11/2025

General information

Provisional. A provisional ecological site description has undergone quality control and quality assurance review. It contains a working state and transition model and enough information to identify the ecological site.

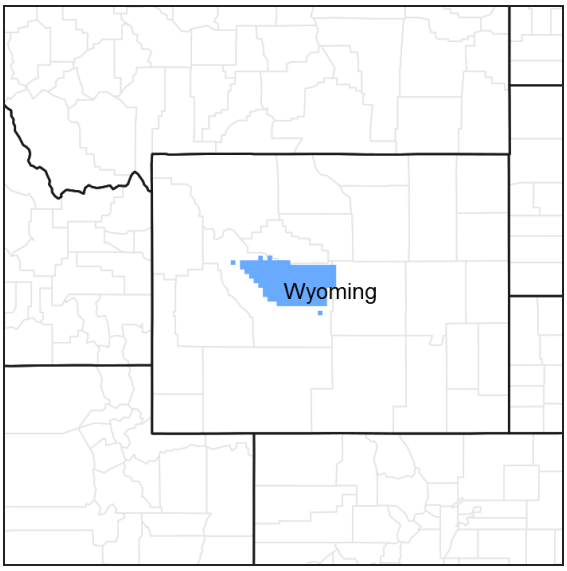


Figure 1. Mapped extent

Areas shown in blue indicate the maximum mapped extent of this ecological site. Other ecological sites likely occur within the highlighted areas. It is also possible for this ecological site to occur outside of highlighted areas if detailed soil survey has not been completed or recently updated.

Associated sites

R032XY204WY	**Clayey (Cy) 5-9” Wind River Basin Precipitation Zone**
R032XY212WY	**Gravelly (Gr) 5-9” Wind River Basin Precipitation Zone**
R032XY262WY	**Shallow Loamy (SwLy) 5-9” Wind River Basin Precipitation Zone**

Similar sites

R032XY358WY	**Shallow Clayey (SwCy) 10-14" East Precipitation Zone** Shallow Clayey 10-14" East P.Z. has higher production.

Table 1. Dominant plant species

Tree	Not specified
Shrub	Not specified
Herbaceous	Not specified

Physiographic features

This site occurs on slopes and ridge tops, but may occur on all slopes.

Table 2. Representative physiographic features

Landforms	(1) Hill (2) Ridge (3) Escarpment
Flooding frequency	None
Ponding frequency	None
Elevation	4,500–6,600 ft
Slope	0–60%
Ponding depth	0 in
Aspect	Aspect is not a significant factor

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:
Minimum Maximum 5 yrs. out of 10 between
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”.

Table 3. Representative climatic features

Frost-free period (average)	175 days
Freeze-free period (average)	185 days
Precipitation total (average)	9 in

Influencing water features

Stream Type: None

Soil features

The soils of this site are shallow (less than 20”to bedrock) well-drained soils formed in alluvium or residuum. These soils have moderately slow to very slow permeability and may occur on all aspects. The bedrock is clay shale which is virtually impenetrable to plant roots. Thin ineffectual layers of other soil textures are disregarded. The soil characteristics having the most influence on the plant community are the shallow depths, heavy textures, and the potential for elevated quantities of soluble salts.

Major Soil Series correlated to this site includes: Persayo

Table 4. Representative soil features

Surface texture	(1) Clay loam (2) Clay (3) Silty clay loam
Family particle size	(1) Clayey
Drainage class	Well drained
Permeability class	Moderately slow
Soil depth	10–20 in
Surface fragment cover <=3"	0–25%
Surface fragment cover >3"	0–10%
Available water capacity (0-40in)	1.4–4.2 in
Calcium carbonate equivalent (0-40in)	0–14%
Electrical conductivity (0-40in)	0–8 mmhos/cm
Sodium adsorption ratio (0-40in)	0–12
Soil reaction (1:1 water) (0-40in)	7.4–9
Subsurface fragment volume <=3" (Depth not specified)	5–15%
Subsurface fragment volume >3" (Depth not specified)	0–10%

Ecological dynamics

Potential vegetation on this site is dominated by mid cool-season perennial grasses. Other significant vegetation includes winterfat, Gardner 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, birdfoot sagebrush and big sagebrush will increase. Weedy annuals will invade. Cool season grasses such as rhizomatous wheatgrasses, bottlebrush squirreltail, and Indian ricegrass will decrease in frequency and production.

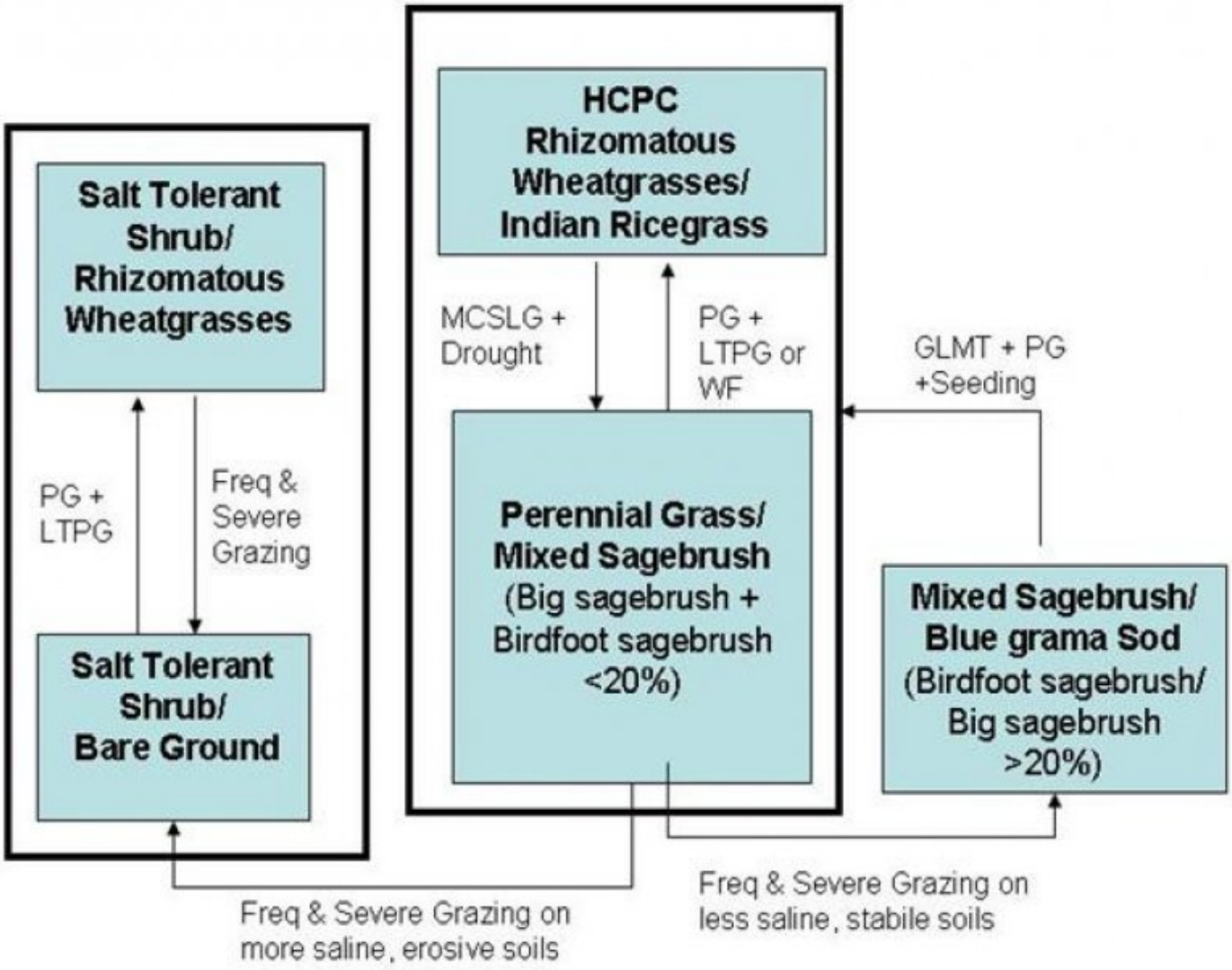
The Historic Climax Plant Community (description follows the plant community diagram) has been determined by study of rangeland relic areas, or areas protected from excessive disturbance. Trends in plant communities going from heavily grazed areas to lightly grazed areas, seasonal use pastures, and historical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

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.

State and transition model



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)

State 1
Rhizomatous Wheatgrasses/Indian Ricegrass

Community 1.1
Rhizomatous Wheatgrasses/Indian Ricegrass

The interpretive plant community for this site is the Historic Climax Plant Community. This state evolved with grazing by large herbivores, soil less than 20 inches, and periodic fires. The cyclical natural of the fire regime in this community prevented big sagebrush from being the dominant landscape. The state is mostly cool season mid-grasses and a variety of forbs and woody species. Potential vegetation is about 70% grasses or grass-like plants, 10% forbs, and 10% woody plants. The major grasses include rhizomatous wheatgrasses, Indian ricegrass, bottlebrush squirreltail, and bluebunch wheatgrass. Other grasses occurring on the state may include Sandberg bluegrass, blue grama, and Fendler threeawn. Big sagebrush, Gardner's saltbush, and winterfat are conspicuous elements of this state, and make up 20% of the annual production. Big sagebrush may become dominant on some areas with absence of fire. 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 250 pounds per acre, but it can range from about 125 lbs./acre in unfavorable years to about 350 lbs./acre in above average years. The state is extremely stable and well adapted to the Northern Great Plains climatic conditions. The diversity in plant species allows 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: • Long-term, moderate, continuous season-long grazing will convert the plant community to the Perennial Grass/Mixed Sagebrush Plant Community. Prolonged Drought will exacerbate this transition.

Figure 3. Plant community growth curve (percent production by month). WY0801, 5-9WR upland sites.

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
			10	50	25	5		10			

State 2
Perennial Grass/ Mixed Sagebrush

Community 2.1
Perennial Grass/ Mixed Sagebrush

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. A variety of shrubs is now a conspicuous part of the overall production. Dominant grasses include western wheatgrass, and bottlebrush squirreltail. Grasses and grass-like species of secondary importance include blue grama, Sandberg bluegrass, Fendler threeawn, and threadleaf sedge. Forbs commonly found in this plant community include scarlet globemallow, wild onion, smooth woodyaster, leafy wildparsley, and Hood's phlox. Big sagebrush, birdfoot sagebrush, Gardner's saltbush, and shadscale saltbush dominate the overstory. Big sagebrush and birdfoot sagebrush can make up to 20% of the annual production. Plains pricklypear cactus can also occur. 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 200 pounds per acre, but it can range from about 100 lbs./acre in unfavorable years to about 300 lbs./acre in above average years. 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. 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 a 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 on more saline soils will convert the plant community to the Salt Tolerant Shrub/Bare Ground Plant Community. • Frequent and severe grazing (yearlong grazing) on less saline soils, will convert the plant community to the Mixed Sagebrush/Blue Grama Sod Plant Community.

Figure 4. Plant community growth curve (percent production by month). WY0801, 5-9WR upland sites.

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
			10	50	25	5		10			

State 3
Mixed Sagebrush Blue grama Sod

Community 3.1
Mixed Sagebrush Blue grama Sod

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 large animals cannot graze forage growing within the cactus clumps. When the historic climax plant community is replaced by warm season grasses total annual production is reduced and the ability of perennial cool season grasses are not able to remain as part of the plant composition. 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. This state is relatively stable and protected from excessive erosion where the sod cover is excessive. 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 and also occur on-site where sod is more patchy. As a result, rills or other more severe erosion can occur on unprotected areas. The watershed may or may not be functioning as runoff may affect adjoining sites. The biotic integrity of this plant community is not intact. Plant diversity is extremely low. Transitional pathways leading to other plant communities are as follows: • Grazing land mechanical treatment (chiseling and seeding, etc.) followed by prescribed grazing and if necessary seeding will return this plant community to near Historic Climax Plant Community.

Figure 5. Plant community growth curve (percent production by month). WY0801, 5-9WR upland sites.

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
			10	50	25	5		10			

State 4
Salt tolerant Shrub/ Bare Ground

Community 4.1
Salt tolerant Shrub/ Bare Ground

This plant community can occur on sites 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 makes up a minor component of the plant community. This site is dominated by an overstory of salt tolerant shrubs, such as greasewood, birdfoot sagebrush and saltbushes, but can vary widely in their composition and production. This variation results from the varying quantity of soluble salts present in the soils and the availability of shrubs to occupy the site. Big sagebrush and rubber rabbitbrush are present but are mostly in small patches. 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. Plant diversity is moderate to poor. When compared

to the HCPC, grass production has diminished but is compensated by the increase in shrub production. 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 150 pounds per acre, but it can range from about 75 lbs./acre in unfavorable years to about 200 lbs./acre in above average years. 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 plant cover and the productivity of the site.

Figure 6. Plant community growth curve (percent production by month). WY0801, 5-9WR upland sites.

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
			10	50	25	5		10			

State 5
Salt Tolerant Shrub/ Rhizomatous Wheatgrasses

Community 5.1
Salt Tolerant Shrub/ Rhizomatous Wheatgrasses

This plant community can occur where the Salt Tolerant/Bare Ground Plant Community is rested and a prescribed grazing management practice is implemented. Salt tolerant shrubs remain a significant component of the plant community, but desirable cool season grasses have reestablished. This site is dominated by an overstory of salt tolerant shrubs, such as birdfoot sagebrush, saltbushes, and greasewood, but can exhibit a wide variety of shrub composition and production. Some perennial cool season mid-grasses have once again reestablished such as rhizomatous wheatgrasses and bottlebrush squirreltail. Other grasses include Sandberg bluegrass, blue grama, and Fendler threeawn. 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. The total annual production (air-dry weight) of this state is about 200 pounds per acre, but it can range from about 125 lbs./acre in unfavorable years to about 300 lbs./acre in above average years. 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 watershed may or may not be functioning and the biotic community is not intact because of the predominant salt tolerant shrub overstory. Plant diversity is moderate Soils are mostly stable and recent soil loss is minimal. This should not be confused with evidence of remnant erosion. Water flow patterns and litter movement is stable but is still occurring on steeper slopes. Incidence of pedestalling has decreased compared to the Salt Tolerant Shrub/Bare Ground Plant Community. 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 plant cover and the productivity of the site, but will not improve the biotic integrity.

Figure 7. Plant community growth curve (percent production by month). WY0801, 5-9WR upland sites.

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
			10	50	25	5		10			

Additional community tables

Table 5. Community 1.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production (Lb/Acre)	Foliar Cover (%)
Grass/Grasslike					
1				50–75	
	western wheatgrass	PASM	*Pascopyrum smithii*	50–75	–
2				13–38	
	Montana wheatgrass	ELAL7	*Elymus albicans*	13–38	–
	bluebunch wheatgrass	PSSP6	*Pseudoroegneria spicata*	13–38	–
3				13–38	
	squirreltail	ELELE	*Elymus elymoides ssp. elymoides*	13–38	–
4				13–38	
	Indian ricegrass	ACHY	*Achnatherum hymenoides*	13–38	–
5				13–50	
	Grass, perennial	2GP	*Grass, perennial*	0–13	–
	Fendler threeawn	ARPUL	*Aristida purpurea var. longiseta*	0–13	–
	blue grama	BOGR2	*Bouteloua gracilis*	0–13	–
	threadleaf sedge	CAFI	*Carex filifolia*	0–13	–
	needle and thread	HECO26	*Hesperostipa comata*	0–13	–
	prairie Junegrass	KOMA	*Koeleria macrantha*	0–13	–
	Sandberg bluegrass	POSE	*Poa secunda*	0–13	–
Forb					
6				13–38	
	Forb, perennial	2FP	*Forb, perennial*	0–13	–
	textile onion	ALTE	*Allium textile*	0–13	–
	small-leaf pussytoes	ANPA4	*Antennaria parvifolia*	0–13	–
	Missouri milkvetch	ASMI10	*Astragalus missouriensis*	0–13	–
	parsnipflower buckwheat	ERHE2	*Eriogonum heracleoides*	0–13	–
	cous biscuitroot	LOCO4	*Lomatium cous*	0–13	–
	leafy wildparsley	MUDI	*Musineon divaricatum*	0–13	–
	plains pricklypear	OPPO	*Opuntia polyacantha*	0–13	–
	spiny phlox	PHHO	*Phlox hoodii*	0–13	–
	scarlet globemallow	SPCO	*Sphaeralcea coccinea*	0–13	–
	western aster	SYAS3	*Symphyotrichum ascendens*	0–13	–
	American vetch	VIAM	*Vicia americana*	0–13	–

	smooth woodyaster	XYGL	*Xylorhiza glabriuscula*	0–13	–
Shrub/Vine					
7				13–25	
	Wyoming big sagebrush	ARTRW8	*Artemisia tridentata ssp. wyomingensis*	13–25	–
8				0–13	
	Gardner's saltbush	ATGA	*Atriplex gardneri*	0–13	–
9				0–13	
	winterfat	KRASC	*Krascheninnikovia*	0–13	–
10				13–38	
	Shrub (>.5m)	2SHRUB	*Shrub (>.5m)*	0–13	–
	birdfoot sagebrush	ARPE6	*Artemisia pedatifida*	0–13	–
	shadscale saltbush	ATCO	*Atriplex confertifolia*	0–13	–
	yellow rabbitbrush	CHVI8	*Chrysothamnus viscidiflorus*	0–13	–
	rubber rabbitbrush	ERNA10	*Ericameria nauseosa*	0–13	–

Animal community

Animal Community – Wildlife Interpretations
Rhizomatous Wheatgrasses/Indian Ricegrass (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 Sagebrush 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 and hosts of other nesting birds utilize stands in the 20-30% cover range.

Mixed Sagebrush/Blue Grama Sod Plant Community: This community provides 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 Sagebrush Plant Community is limited. 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. In most cases, it is not a desirable plant community to select as a wildlife habitat management objective.

Salt Tolerant Shrub/Rhizomatous Wheatgrass Plant Community: This community provides some foraging for antelope and other grazers. They may be used as a foraging site by sage grouse if proximal to woody cover.

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 Carrying Capacity*
(lb./ac) (AUM/ac)
Historic Climax Plant Community 125-350 .10
Perennial Grass/Mixed Sagebrush 100-300 .08
Mixed Sagebrush/Blue Grama Sod 50-150 .03
Salt Tolerant Shrub/Bare Ground 75-200 .03
Salt Tolerant Shrub/Rhizomatous Wheatgrasses 125-300 .05

* - 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.

Hydrological functions

Water is the principal factor limiting forage production on this site. This site is dominated by soils in hydrologic group C and D. Infiltration ranges from very 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 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 such as bluebunch wheatgrass. 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

Inventory data references

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, NRCS. 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.

Contributors

C. Krassin

Rangeland health reference sheet

Interpreting Indicators of Rangeland Health is a qualitative assessment protocol used to determine ecosystem condition based on benchmark characteristics described in the Reference Sheet. A suite of 17 (or more) indicators are typically considered in an assessment. The ecological site(s) representative of an assessment location must be known prior to applying the protocol and must be verified based on soils and climate. Current plant community cannot be used to identify the ecological site.

Author(s)/participant(s)	
Contact for lead author	
Date	07/01/2005
Approved by	E. Bainter
Approval date	
Composition (Indicators 10 and 12) based on	Annual Production

Indicators

1. **Number and extent of rills:** Due to the wide slope range associated with this site, the number and extent of rills will vary from none on sites with slopes of < 9% to common on slopes > 25%.

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2. **Presence of water flow patterns:** Due to the wide slope range associated with this site, water flow patterns will vary from barely observable on sites with slopes of < 9% from broken and irregular in appearance to continuous on slopes > 25%.

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3. **Number and height of erosional pedestals or terracettes:** Not evident on slopes < 9%. Erosional pedestals will be present with terracettes present at debris dams on slopes >9%.

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4. **Bare ground from Ecological Site Description or other studies (rock, litter, lichen, moss, plant canopy are not bare ground):** Bare ground is 35 to 45%.

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5. **Number of gullies and erosion associated with gullies:** Active gullies restricted to concentrated water flow patterns.

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6. **Extent of wind scoured, blowouts and/or depositional areas:** None.

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7. **Amount of litter movement (describe size and distance expected to travel):** Little to no plant litter movement occurs on slopes < 9%. Litter movement does occur on slopes > 25%.

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8. **Soil surface (top few mm) resistance to erosion (stability values are averages - most sites will show a range of values):** Plant cover and litter is at 50% or greater of soil surface and maintains soil surface integrity. Stability class anticipated to be 5 or greater.

9. **Soil surface structure and SOM content (include type of structure and A-horizon color and thickness):** Use soil series description for depth and color of A-horizon.

10. **Effect of community phase composition (relative proportion of different functional groups) and spatial distribution on infiltration and runoff:** Plant canopy (50% maximum), very slow to slow infiltration rates, the amount of bare ground, and steepness of slopes results in a naturally high runoff rate on slopes > 25%, even in HCPC.

11. **Presence and thickness of compaction layer (usually none; describe soil profile features which may be mistaken for compaction on this site):** No compaction layer would be expected except for the naturally occurring rooting restriction (bedrock or decomposing shale) at 10 to 20 inches.

12. **Functional/Structural Groups (list in order of descending dominance by above-ground annual-production or live foliar cover using symbols: >>, >, = to indicate much greater than, greater than, and equal to):**

    Dominant:

    Sub-dominant:

    Other:

    Additional: Mid-stature grasses > shrubs > short grasses/grasslikes > forbs

13. **Amount of plant mortality and decadence (include which functional groups are expected to show mortality or decadence):** Very low.

14. **Average percent litter cover (%) and depth (in):** Average litter cover is 15-25% with depths of 0.1 to 0.2 inches. Litter cover is in contact with soil surface with little evidence of biological activity.

15. **Expected annual annual-production (this is TOTAL above-ground annual-production, not just forage annual-production):** 250 lbs/acre

16. **Potential invasive (including noxious) species (native and non-native). List species which BOTH characterize degraded states and have the potential to become a dominant or co-dominant species on the ecological site if their future establishment and growth is not actively controlled by management interventions. Species that become dominant for only one to several years (e.g., short-term response to drought or wildfire) are not invasive plants. Note that unlike other indicators, we are describing what is NOT expected in the reference state for the ecological site:** Blue grama, Birdfoot sagebrush, Big sagebrush, Annuals, Exotics, and Species found on Noxious Weed List.

17. **Perennial plant reproductive capability:** No limitations.