USDA Natural Resources Conservation Service

Ecological site R032XY358WY
Shallow Clayey (SwCy) 10-14" East Precipitation Zone

Last updated: 4/30/2024
Accessed: 05/14/2024

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.

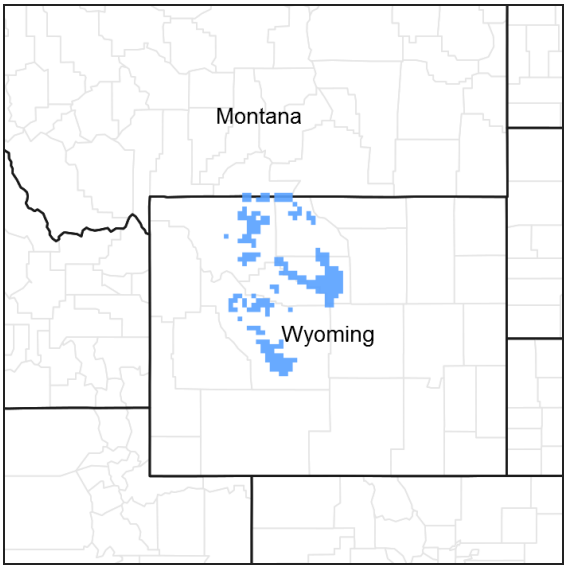


Figure 1. Mapped extent

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

R032XY304WY	**Clayey (Cy) 10-14" East Precipitation Zone**
R032XY312WY	**Gravelly (Gr) 10-14" East Precipitation Zone**
R032XY362WY	**Shallow Loamy (SwLy) 10-14" East Precipitation Zone**

Similar sites

R032XY258WY	**Shallow Clayey (SwCy) 5-9” Wind River Basin Precipitation Zone**
R032XY158WY	**Shallow Clayey (SwCy) 5-9” Big Horn Basin Precipitation Zone**

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	1,646–2,286 m
Slope	0–60%
Ponding depth	0 cm
Aspect	Aspect is not a significant factor

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”.

Table 3. Representative climatic features

Frost-free period (average)	149 days
Freeze-free period (average)	180 days
Precipitation total (average)	356 mm

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) Loamy
Drainage class	Well drained
Permeability class	Very slow to moderately slow
Soil depth	25–51 cm
Surface fragment cover <=3"	0–25%
Surface fragment cover >3"	0–10%
Available water capacity (0-101.6cm)	3.56–10.67 cm
Calcium carbonate equivalent (0-101.6cm)	0–14%
Electrical conductivity (0-101.6cm)	0–8 mmhos/cm
Sodium adsorption ratio (0-101.6cm)	0–12
Soil reaction (1:1 water) (0-101.6cm)	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’s saltbush, birdfoot sagebrush, and a variety of forbs. The expected potential composition for this site is about 75% grasses, 10% forbs and 15% 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, rhizomatous wheatgrass, and shrubs will increase. Plains pricklypear and weedy annuals will invade. Cool season grasses such as bluebunch or Griffith’s wheatgrasses and Indian ricegrass will decrease in frequency and production.

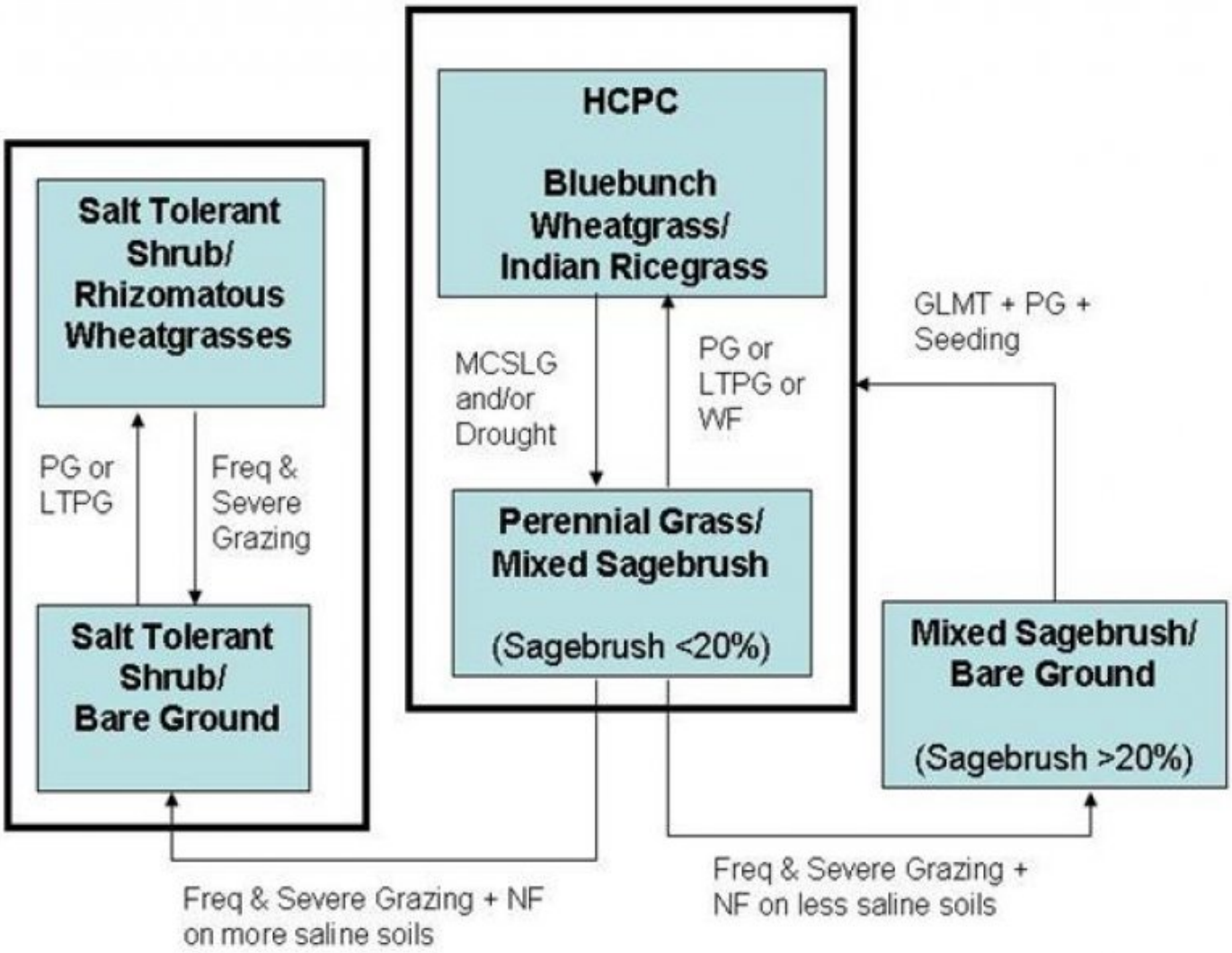
The Historic Climax Plant Community (description follows the plant community diagram) has been determined by study of rangeland relic areas, or areas protected from excessive disturbance. Trends in plant communities going from heavily grazed areas to lightly grazed areas, seasonal use pastures, and historical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

Community 1.1
Bluebunch Wheatgrass/ 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 an occasional wildfire. The cyclical nature of the fire regime in this community prevented big sagebrush from being the dominant landscape. The state is mostly comprised of cool season mid-grasses and a variety of forbs and woody species. Potential vegetation is about 75% grasses or grass-like plants, 10% forbs, and 15% woody plants. The major grasses include bluebunch and Griffith's wheatgrasses, Indian ricegrass, and rhizomatous wheatgrasses. Green needlegrass is considered a major grass, however, it is usually found in the higher precipitation areas of this zone. Other grasses occurring on the state may include prairie junegrass, Sandberg bluegrass, blue grama, and spikefescue. Big and black sagebrush, Gardner's saltbush, and winterfat are conspicuous elements of this state, and often make up 15% of the annual production. 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 500 pounds per acre, but it can range from about 350 lbs./acre in unfavorable years to about 700 lbs./acre in above average years. The state is extremely stable and well adapted to the Northern Intermountain Desertic Basins climate. 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: • 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). WY0701, 10-14E upland sites.

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
			5	25	40	10	5	10	5		

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. Fire is a rarity and extended periods without fire is common as fire suppression has changed the natural fire regime. 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. The dominant grasses include bluebunch or Griffith's wheatgrass, rhizomatous wheatgrasses, and bottlebrush squirreltail. Green needlegrass is considered a major grass, however, it is usually found in the higher precipitation areas of this zone. Grasses and grass-like species of secondary importance include prairie junegrass, blue grama, and Sandberg bluegrass. Forbs commonly found in this plant community include scarlet globemallow, wild onion, smooth woodyaster, leafy wildparsley, and Hood's phlox. Big sagebrush, black sagebrush, birdfoot sagebrush, Gardner's saltbush, and shadscale saltbush dominate the overstory. These shrubs can make up to 20% of the annual production. Plains pricklypear cactus can also invade. When compared to the Historic Climax Plant Community, big sagebrush, black sagebrush, birdfoot sagebrush, rhizomatous wheatgrasses, prairie junegrass, and blue grama have increased. Plains pricklypear cactus may have invaded, but occurs only in small patches. Indian ricegrass and bluebunch wheatgrass have 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 425 pounds per acre, but it can range from about 250 lbs./acre in unfavorable years to about 650 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 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. • Frequent and severe grazing plus no fire on more saline soils will convert the plant community to the Salt Tolerant Shrub/*Bare Ground* Plant Community. • Frequent and severe grazing (yearlong grazing) plus no fire on less saline soils, will convert the plant community to the Mixed Sagebrush/*Bare Ground* Plant Community.

Figure 4. Plant community growth curve (percent production by month). WY0701, 10-14E upland sites.

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
			5	25	40	10	5	10	5		

State 3
Mixed Sagebrush/ Bare Ground

Community 3.1
Mixed Sagebrush/ Bare Ground

This plant community is the result of frequent and severe yearlong grazing and no fire. Soils on these sites are usually less saline. It is dominated by shrubs but areas of blue grama sod can occur. Big sagebrush, black sagebrush, and birdfoot sagebrush are the most common shrubs in this plant community. Pricklypear cactus can become dense in areas so that livestock cannot graze forage growing within the cactus clumps. Perennial cool season mid-grasses have been removed leaving mostly bare ground amongst the shrub component but patches of blue grama and annuals are noticeable. 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 state. When the historic climax plant community is replaced by warm season grasses total annual production is reduced. The total annual production (air-dry weight) of this state is about 250 pounds per acre, but it can range from about 100 lbs./acre in unfavorable years to about 350 lbs./acre in above average years. This state is relatively stable as the shrubs become more dominant. Patches occupied by the grass sod are protected from excessive erosion. The sod formed by these grasses is resistant to water infiltration. While the soil is protected by the sod areas, excessive runoff may occur outside the sodded area. 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 low. Transitional pathways leading to other plant communities are as follows: • Grazing land mechanical treatment (chiseling 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). WY0701, 10-14E upland sites.

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
			5	25	40	10	5	10	5		

State 4
Salt tolerant Shrub/ Bare Ground

Community 4.1
Salt tolerant Shrub/ Bare Ground

This plant community can occur on sites subjected to frequent and severe grazing and on soils influenced by elevated amounts of soluble salts. Salt tolerant shrubs will replace the characteristic shrub species as the major overstory species, while the preferred cool season grasses have been eliminated or greatly reduced. Bare ground and weedy grasses and forbs dominate the understory. This state is dominated by an overstory of salt tolerant shrubs, such as greasewood, birdfoot sagebrush and saltbushes, which can vary widely in their composition and

production. The leaves of some 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. 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 the site. Plant diversity is moderate to poor. When compared to the HCPC, grass production has diminished but is somewhat off set 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 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 375 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 Wheatgrasses 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 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 mostly ineffective and extremely costly. Seeding more salt-tolerant native grasses and forbs will improve the productivity of the site and also improve plant cover.

Figure 6. Plant community growth curve (percent production by month). WY0701, 10-14E upland sites.

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
			5	25	40	10	5	10	5		

State 5
Salt tolerant Shrub/ Rhizomatous Wheatgrasses

Community 5.1
Salt tolerant Shrub/ Rhizomatous Wheatgrasses

This plant community can occur where prescribed grazing management is implemented in the Salt Tolerant Shrub/*Bare Ground* Plant Community. Salt tolerant shrubs remain a significant component of the plant community, but preferred 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 important 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 400 pounds per acre, but it can range from about 225 lbs./acre in unfavorable years to about 550 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 is improving. 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 mostly ineffective and extremely costly. Seeding more salt-tolerant grasses and forbs will improve the productivity of the site and also plant cover, but will not improve the biotic integrity.

Figure 7. Plant community growth curve (percent production by month). WY0701, 10-14E upland sites.

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
			5	25	40	10	5	10	5		

Additional community tables

Table 5. Community 1.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production (Kg/Hectare)	Foliar Cover (%)
Grass/Grasslike					
1				112–168	
	Montana wheatgrass	ELAL7	*Elymus albicans*	112–168	–
	bluebunch wheatgrass	PSSP6	*Pseudoroegneria spicata*	112–168	–
2				84–140	
	Indian ricegrass	ACHY	*Achnatherum hymenoides*	84–140	–
3				56–112	
	western wheatgrass	PASM	*Pascopyrum smithii*	56–112	–
4				6–84	
	green needlegrass	NAVI4	*Nassella viridula*	6–84	–
5				0–56	
	Grass, perennial	2GP	*Grass, perennial*	0–28	–
	blue grama	BOGR2	*Bouteloua gracilis*	0–28	–
	squirreltail	ELEL5	*Elymus elymoides*	0–28	–
	prairie Junegrass	KOMA	*Koeleria macrantha*	0–28	–
	spike fescue	LEKI2	*Leucopoa kingii*	0–28	–
	Sandberg bluegrass	POSE	*Poa secunda*	0–28	–
Forb					
6				0–56	
	Forb, perennial	2FP	*Forb, perennial*	0–28	–
	textile onion	ALTE	*Allium textile*	0–28	–
	rosy pussytoes	ANRO2	*Antennaria rosea*	0–28	–
	Indian paintbrush	CASTI2	*Castilleja*	0–28	–
	sulphur-flower buckwheat	ERUM	*Eriogonum umbellatum*	0–28	–
	cous biscuitroot	LOCO4	*Lomatium cous*	0–28	–
	leafy wildparsley	MUDI	*Musineon divaricatum*	0–28	–
	beardtongue	PENST	*Penstemon*	0–28	–
	spiny phlox	PHHO	*Phlox hoodii*	0–28	–
	scarlet globemallow	SPCO	*Sphaeralcea coccinea*	0–28	–
	smooth woodyaster	XYGL	*Xylorhiza glabriuscula*	0–28	–
Shrub/Vine					
7				28–84	
	Shrub (>.5m)	2SHRUB	*Shrub (>.5m)*	0–28	–
	black sagebrush	ARNO4	*Artemisia nova*	0–28	–
	birdfoot sagebrush	ARPE6	*Artemisia pedatifida*	0–28	–
	Wyoming big sagebrush	ARTRW8	*Artemisia tridentata ssp. wyomingensis*	0–28	–
	shadscale saltbush	ATCO	*Atriplex confertifolia*	0–28	–
	Gardner's saltbush	ATGA	*Atriplex gardneri*	0–28	–
	yellow rabbitbrush	CHVI8	*Chrysothamnus viscidiflorus*	0–28	–
	winterfat	KRLA2	*Krascheninnikovia lanata*	0–28	–

Animal community

Animal Community – Wildlife Interpretations

Bluebunch Wheatgrass/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 plants, and hosts of other nesting birds utilize stands in the 20-30% cover range.

Mixed Sagebrush/*Bare Ground* 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.

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 may provide some thermal and escape cover for deer and antelope if no other woody community is nearby, but in most cases, it is not a desirable plant community to select as a wildlife habitat management objective.

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

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 350-700 .20
Perennial Grass/ Mixed Sagebrush 250-650 .17
Mixed Sagebrush/*Bare Ground* 100-350 .1
Salt Tolerant Shrub/*Bare Ground* 200-375 .05
Salt Tolerant Shrub/Rhizomatous Wheatgrasses 225-550 .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.

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

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Approval

Kirt Walstad, 4/30/2024

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.

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Date	05/02/2008
Approved by	Kirt Walstad
Approval date	
Composition (Indicators 10 and 12) based on	Annual Production

Indicators

1. **Number and extent of rills:** Rare to nonexistent. Where present, short and widely spaced.

2. **Presence of water flow patterns:** Barely observable.

3. **Number and height of erosional pedestals or terracettes:** Rare to nonexistent.

4. **Bare ground from Ecological Site Description or other studies (rock, litter, lichen, moss, plant canopy are not bare ground):** Bare ground can range from 20-50%.

5. **Number of gullies and erosion associated with gullies:** Active gullies should not be present.

6. **Extent of wind scoured, blowouts and/or depositional areas:** Rare to nonexistent.

7. **Amount of litter movement (describe size and distance expected to travel):** Herbaceous litter expected to move only in small amounts (to leeward side of shrubs). Large woody debris from sagebrush will show no movement.

8. **Soil surface (top few mm) resistance to erosion (stability values are averages - most sites will show a range of values):** Soil Stability Index ratings range from 1 (interspaces) to 5 (under plant canopy), but average values should be 3.0 or greater.

9. **Soil surface structure and SOM content (include type of structure and A-horizon color and thickness):** Soil data is limited for this site. Soil OM usually varies from .5 to 1.5%.

10. **Effect of community phase composition (relative proportion of different functional groups) and spatial distribution on infiltration and runoff:** Plant community consists of 60-85% grasses, 5% forbs, and 10-35% shrubs. Evenly distributed plant canopy (30-50%) and litter plus slow to moderate infiltration rates result in slight to minimal runoff. Basal cover is typically less than 5% for this site and does very little to effect runoff on this site.

11. **Presence and thickness of compaction layer (usually none; describe soil profile features which may be mistaken for compaction on this site):** None, but some soil crusting and cracking is expected during dry conditions.

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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: cool season rhizomatous grasses> perennial shrubs>>Mid-size, cool season bunchgrasses>>short, cool season bunchgrasses>perennial forbs

    Sub-dominant:

    Other:

    Additional:

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13. **Amount of plant mortality and decadence (include which functional groups are expected to show mortality or decadence):** Minimal decadence, typically associated with shrub component.

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14. **Average percent litter cover (%) and depth (in):** Litter ranges from 20-30% of total canopy measurement with total litter (including beneath the plant canopy) from 30-50% expected. Herbaceous litter depth typically ranges from 3-10mm. Woody litter can be up to a couple inches (4-6 cm).

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15. **Expected annual annual-production (this is TOTAL above-ground annual-production, not just forage annual-production):** English: 350-700 lb/ac (525 lb/ac average); Metric 392 -784 kg/ha (588 kg/ha average).

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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:** Bare ground greater than 75% is the most common indicator of a threshold being crossed. Blue grama, rhizomatous wheatgrasses, Rabbitbrush and other shrubs, Sandberg bluegrass, and phlox are common increasers. Annual weeds such as kochia, mustards, lambsquarter, and Russian thistle are common invasive species in disturbed sites.

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17. **Perennial plant reproductive capability:** All species are capable of reproducing, except in drought years.
