

Ecological site R032XY248WY Sandstone Breaks (SaB) 5-9” Wind River Basin Precipitation Zone

Accessed: 05/06/2024

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.

Associated sites

R032XY250WY	Sandy (Sy) 5-9” Wind River Basin Precipitation Zone
R032XY266WY	Shallow Sandy (SwSy) 5-9” Wind River Basin Precipitation Zone

Table 1. Dominant plant species

Tree	Not specified
Shrub	Not specified
Herbaceous	Not specified

Physiographic features

This site occurs on nearly level to 50% slopes.

Table 2. Representative physiographic features

Landforms	(1) Hill (2) Ridge (3) Escarpment
Flooding frequency	None
Ponding frequency	None
Elevation	1,372–2,012 m
Slope	0–50%
Ponding depth	0 cm
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)	229 mm

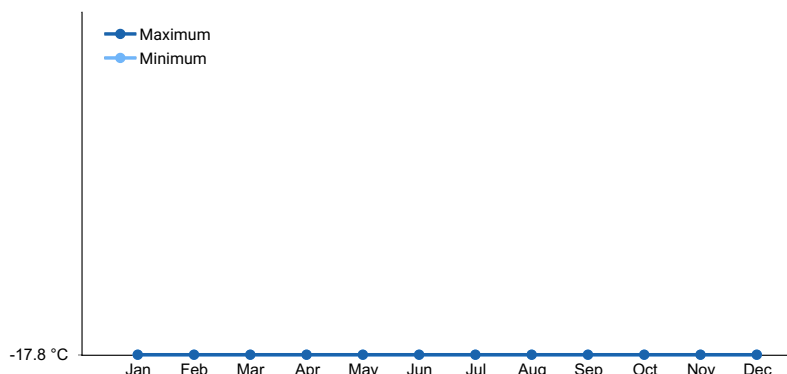


Figure 1. Monthly average minimum and maximum temperature

Influencing water features

Stream Type: None

Soil features

The soils of this site are typically shallow (less than 20”to bedrock) well-drained to excessively drained soils formed in eolian deposits or alluvium over residuum or residuum. Intermingled through this site are areas of Sands, Shallow Sandy and Sandy Ecological Sites. These soils have moderately rapid to rapid permeability and may occur on all aspects. The bedrock generally is sandstone although there may be areas of soft shale bedrock as well. The soil characteristic having the most influence on the plant community is the shallow depths and light textures, which reduce the amount of available moisture.

Table 4. Representative soil features

Surface texture	(1) Loamy fine sand (2) Fine sandy loam (3) Sandy loam
Family particle size	(1) Sandy
Drainage class	Well drained to excessively drained
Permeability class	Moderately rapid to very rapid
Soil depth	5–51 cm
Surface fragment cover <=3"	0%
Surface fragment cover >3"	0%
Available water capacity (0-101.6cm)	1.52–7.11 cm
Calcium carbonate equivalent (0-101.6cm)	0–5%
Electrical conductivity (0-101.6cm)	0–5 mmhos/cm
Sodium adsorption ratio (0-101.6cm)	0
Soil reaction (1:1 water) (0-101.6cm)	6.6–8.4
Subsurface fragment volume <=3" (Depth not specified)	0–10%
Subsurface fragment volume >3" (Depth not specified)	0%

Ecological dynamics

Potential vegetation on this site is dominated by drought tolerant plants, which include a variety of mid cool-season perennial grasses and forbs, and skunkbush sumac. The expected potential composition for this site is about 50% grasses, 25% forbs and 25% 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 threadleaf sedge, badlands mules-ear, skunkbush sumac, and yucca will increase. Weedy annuals will invade. Cool season grasses such as needleandthread, Indian ricegrass, and rhizomatous wheatgrasses 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.

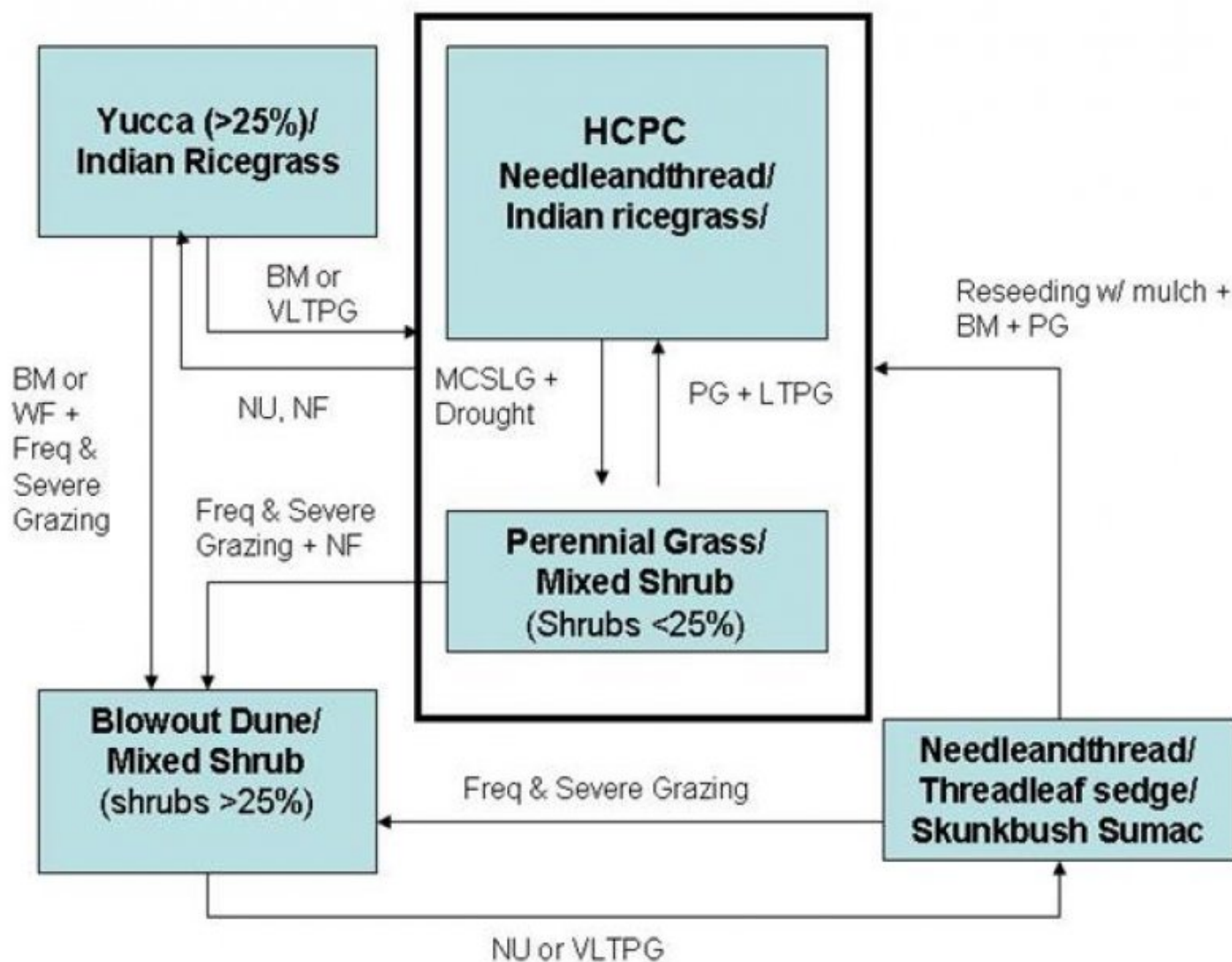
The following is a State and Transition Model Diagram that illustrates the common plant communities (states) that can occur on the site and the transitions between these communities. The ecological processes will be discussed in more detail in the plant community narratives following the diagram.

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

State 1 Needleandthread/Indian ricegrass

Community 1.1 Needleandthread/Indian ricegrass

The interpretive plant community for this site is the Historic Climax Plant Community. This state evolved with grazing by large herbivores, soils less than 10 inches in depth, and low fire frequency. Cool season midgrasses are the primary vegetation in this state but shrubs and forbs are also prominent. Potential vegetation is about 50% grasses or grass-like plants, 25% forbs, and 25% woody plants. This state is found on areas that are properly managed and on areas receiving occasional short periods of rest. The major grasses include needleandthread, Indian ricegrass, and rhizomatous wheatgrasses. Other grasses occurring on the state include bluebunch wheatgrass, prairie sandreed, sand dropseed, Sandberg bluegrass, and threadleaf sedge. Skunkbush sumac is a conspicuous component of this state. A variety of forbs and shrubs also occur in this state and plant diversity is high (see Plant Composition Table). The total annual production (air-dry weight) of this state is about 175 pounds per acre, but it can range from about 75 lbs./acre in unfavorable years to about 250 lbs./acre in above average years. The state is 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: • Moderate, Continuous Season-Long grazing will convert the plant community to the Perennial Grass/Mixed Shrub Plant Community. Prolonged Drought will exacerbate this transition. • Protection from grazing and fire will convert this plant community to the Indian Ricegrass/Yucca Vegetation State.

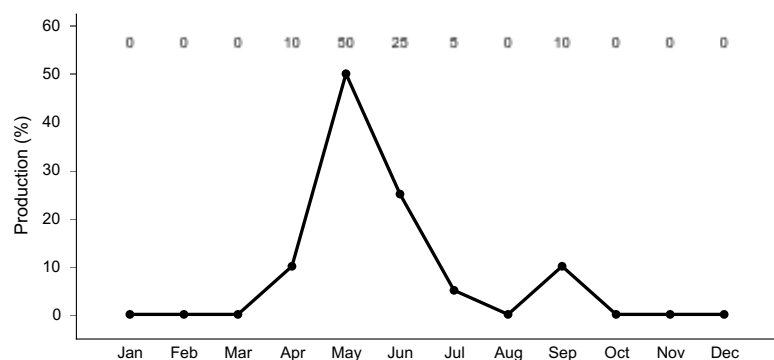


Figure 3. Plant community growth curve (percent production by month). WY0801, 5-9WR upland sites.

State 2 Yucca/ Indian Ricegrass

Community 2.1 Yucca/ Indian Ricegrass

This plant community results from little or no use and no fires over an extended period in the HCPC. Mid perennial grasses make up the majority of the understory and the overstory is dominated by yucca. The understory of grass and grass-like plants includes Indian ricegrass, needleandthread, and rhizomatous wheatgrasses. Forbs commonly found in this plant community include Badlands mule's-ears, scarlet globemallow, fringed sagewort, lemon scurfpea, sulphur flower buckwheat, sandwort, rush skeletonweed, and phlox. When compared to the Historic Climax Plant Community, yucca has significantly increased. Indian ricegrass has also increased. Needleandthread and some forbs have decreased. Total production has remained about the same but due to the increase in yucca less forage is available. The total annual production (air-dry weight) of this state is about 175 pounds per acre, but it can range from about 75 lbs./acre in unfavorable years to about 225 lbs./acre in above average years. The state persists if management remains constant and fires are suppressed. The diversity in plant species allows for high drought resistance. Individual grass plants may show signs of maturation and decadence. Additional plant litter if significant on the soil surface may affect live plants and/or prohibit regeneration of new seedlings, which may lead to plant mortality and an increase in the amount of bare ground. The extent of these conditions, however, depends on the duration of nonuse and absence of fire. Soils are mostly stable and the surface shows minimum soil loss. The watershed is functioning and the biotic community is mostly intact. Transitions or pathways leading to other

plant communities are as follows: • Brush management or wildfire + prescribed grazing, will convert the plant community to near HCPC. • Brush management or wildfire + frequent and severe grazing, will convert the plant community to a Blowout Dune/Mixed Shrub Vegetative State. Although many of these shrubs are susceptible to brush control, recolonization will occur quickly. Grazing will remove entire herbaceous plants including the root system due to the plants inability to anchor to these coarser soils. Without these plants, shrubs will have a competitive advantage. In addition, the lack of cover will invite wind erosive processes to occur leaving the soil susceptible to wind-scouring and deposition.

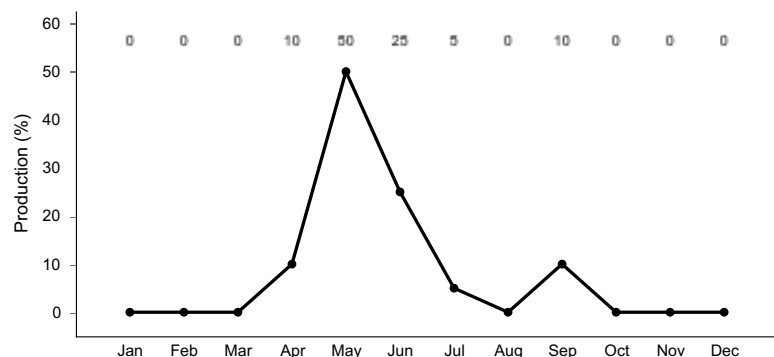


Figure 4. Plant community growth curve (percent production by month). WY0801, 5-9WR upland sites.

State 3 Perennial Grass/ Mixed Shrub

Community 3.1 Perennial Grass/ Mixed Shrub

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 mid grasses, while short warm-season grasses and miscellaneous forbs account for the balance of the understory. The overstory is comprised of a variety of shrubs. The dominant grasses and grasslikes include needleandthread, rhizomatous wheatgrasses, threadleaf sedge, Sandberg bluegrass, sand dropseed, Fendler threeawn, and blue grama. Forbs commonly found on the site include badlands mules-ear, waxleaf penstemon, little larkspur, sulfur flower buckwheat, rush skeletonweed, miner's candle, and lemon scurfpea. Shrubs can make up to 35% of the annual production. These include skunkbush sumac, silver sagebrush, yucca, and green rabbitbrush. The overstory of shrubs and understory of grass and forbs provide a diverse plant community. When compared to the Historic Climax Plant Community, Indian ricegrass has decreased. Indian ricegrass may occur in only trace amounts under the brush canopy or within the patches of pricklypear. Threadleaf sedge, blue grama, big sagebrush, skunkbush sumac and a variety of forbs have increased. Plains pricklypear cactus will also have increased, but occurs only in small patches. Total production is less as the mid cool season grasses are replaced with short warm season grasses. The total annual production (air-dry weight) of this state is about 125 pounds per acre, but it can range from about 50 lbs./acre in unfavorable years to about 200 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. Incidence of pedestalling is minimal. Soils are mostly stable, but areas of wind-scouring and deposition are noticeable in small patches. The watershed is functioning and the biotic community is intact. Transitional pathways leading to other plant communities are as follows: • Prescribed grazing and possibly long-term prescribed grazing is needed to return this state to near Historic Climax Plant Community condition. • Frequent and severe grazing and no fire, will convert the plant community to the Blowout Dune/Mixed Shrub Plant Community.

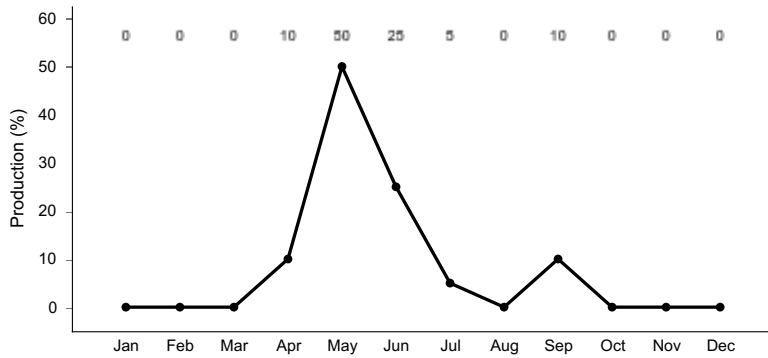


Figure 5. Plant community growth curve (percent production by month). WY0801, 5-9WR upland sites.

State 4 Blowout Dune/Mixed Shrub

Community 4.1 Blowout Dune/Mixed Shrub

This plant community is the result of Frequent and severe grazing and protection from fire. Bare sand and shrubs dominate this plant community, as the annual production of skunkbush sumac, green rabbitbrush and yucca will exceed 35%. Skunkbush sumac, yucca, and badlands mule's-ears become dominant plants on this state. These plant species are significant components of the plant community and the preferred cool season grasses have been eliminated or greatly reduced. The dominant grasses and grasslikes are sand dropseed, Fendler threeawn, threadleaf sedge, and blue grama. Weedy annual species such as cheatgrass, Russian thistle, kochia, and a variety of mustards may occupy the site if seed sources are available. Patches of pricklypear cactus can be noticeable. The interspaces between plants have expanded leaving the amount of bare ground more prevalent. Grass production is significantly reduced as has the amount of available forage, but the total production is only slightly lower as the amount of production from shrubs has increased. The total annual production (air-dry weight) of this state is about 100 pounds per acre, but it can range from about 35 lbs./acre in unfavorable years to about 175 lbs./acre in above average years. This plant community is relatively resistant to change. Continued frequent and severe grazing does not seem to affect the plant composition or structure of the plant community. These areas are more resistant to fire as less fine fuels are available and the bare ground between the shrub plants is increased. Plant diversity is poor. Production is reduced and plant vigor is diminished due to blowing sand, which can defoliate the vegetative parts of the grass plants. The soils are exposed to wind as erosion is accelerated and blowouts increase. Pedestalling is pervasive and eolian deposits (dunes) form around the clumped vegetation. This situation is normally extensive. Transitional pathways leading to other plant communities are as follows: • No use or very long-term grazing prescribed grazing, will convert this plant community to the Needleandthread/Threadleaf Sedge/Yucca Vegetative State.

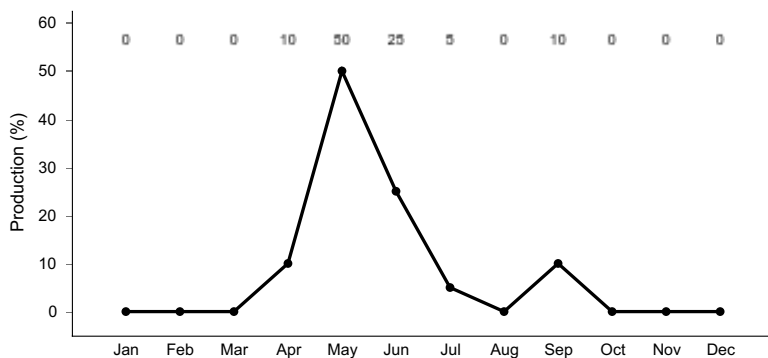


Figure 6. Plant community growth curve (percent production by month). WY0801, 5-9WR upland sites.

State 5 Needleandthread/Threadleaf sedge/Skunkbush Sumac

Community 5.1

Needleandthread/Threadleaf sedge/Skunkbush Sumac

This plant community can occur where the Blowout Dune/Mixed Shrub Plant Community is reseeded with mulch and/or rested or a prescribed grazing long-term management practice is implemented. Skunkbush sumac and possibly yucca remain significant components of the plant community, but grasses such as needleandthread and threadleaf sedge have reestablished on the bare sand areas. A sod of these grasses may even dominate this site. Pricklypear cactus can also become established in dense patches. The skunkbush sumac and yucca are present but are mostly localized to the original areas occupied on the ridgeline of the dunes. The blowout areas and dune slopes are now mostly covered with needleandthread and threadleaf sedge. Other important grasses besides the needleandthread and threadleaf sedge are the rhizomatous wheatgrasses when present, Fendler threeawn, Sandberg bluegrass and blue grama. Patches of annuals such as cheatgrass and other weedy annual forbs such as halogeton, Russian thistle, and kochia will persist on this site if not treated. The interspaces between plants will have diminished in size. When compared with the HCPC or the Perennial Grass/ Mixed Shrub Plant Communities, the annual production is less. Most of the climax grasses are not present such as Indian ricegrass and prairie sandreed. The total annual production (air-dry weight) of this state is about 125 pounds per acre, but it can range from about 50 lbs./acre in unfavorable years to about 180 lbs./acre in above average years. This sod is somewhat resistant to change under moderate grazing and the reestablishment of perennial mid and tall grasses is difficult in this situation. The biotic integrity of this state is minimally functional and plant diversity is moderate to low. Erosion has been diminished as the sodded areas are resistant to wind erosive processes. The remnant dune formations should not be confused with current wind erosion processes. Pedestalling is still apparent along the sod edges, but is not progressing. Transitional pathways leading to other plant communities are as follows: • Reseeding with mulch with brush management and prescribed grazing, is necessary to return a protective vegetation cover to this state so as to convert this to near HCPC. The grazing prescription most commonly used is complete deferment during the growing season, with limited use in the winter. This will provide as much plant litter cover as possible to protect the soil surface. • Frequent and severe grazing will return the plant community to the Blowout Dune/Mixed Shrub Plant Community.

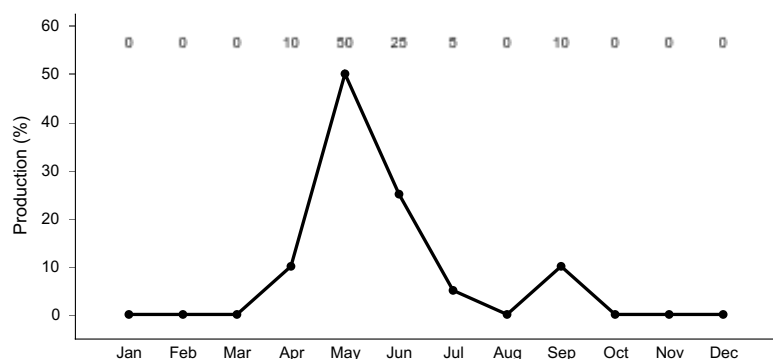


Figure 7. Plant community growth curve (percent production by month). WY0801, 5-9WR upland sites.

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				29-49	
	needle and thread	HECO26	<i>Hesperostipa comata</i>	29-49	-
2				29-49	
	Indian ricegrass	ACHY	<i>Achnatherum hymenoides</i>	29-49	-
3				10-29	
	western wheatgrass	PASM	<i>Pascopyrum smithii</i>	10-29	-
4				20-39	
	Grass, perennial	2GP	<i>Grass, perennial</i>	0-10	-

	Fendler threeawn	ARPUL	<i>Aristida purpurea</i> var. <i>longiseta</i>	0-10	-
	blue grama	BOGR2	<i>Bouteloua gracilis</i>	0-10	-
	threadleaf sedge	CAFI	<i>Carex filifolia</i>	0-10	-
	prairie sandreed	CALO	<i>Calamovilfa longifolia</i>	0-10	-
	Montana wheatgrass	ELAL7	<i>Elymus albicans</i>	0-10	-
	Sandberg bluegrass	POSE	<i>Poa secunda</i>	0-10	-
	bluebunch wheatgrass	PSSP6	<i>Pseudoroegneria spicata</i>	0-10	-
	alkali sacaton	SPAI	<i>Sporobolus airoides</i>	0-10	-
	sand dropseed	SPCR	<i>Sporobolus cryptandrus</i>	0-10	-
Forb					
5				10-29	
	mule-ears	WYETH	<i>Wyethia</i>	10-29	-
6				20-39	
	Forb, perennial	2FP	<i>Forb, perennial</i>	0-10	-
	textile onion	ALTE	<i>Allium textile</i>	0-10	-
	Franklin's sandwort	ARFR	<i>Arenaria franklinii</i>	0-10	-
	Missouri milkvetch	ASMI10	<i>Astragalus missouriensis</i>	0-10	-
	woollypod milkvetch	ASPU9	<i>Astragalus purshii</i>	0-10	-
	wavyleaf Indian paintbrush	CAAPM	<i>Castilleja applegatei</i> ssp. <i>martinii</i>	0-10	-
	bastard toadflax	COUM	<i>Comandra umbellata</i>	0-10	-
	miner's candle	CRVI4	<i>Cryptantha virgata</i>	0-10	-
	sulphur-flower buckwheat	ERUM	<i>Eriogonum umbellatum</i>	0-10	-
	Wyeth's lupine	LUWY	<i>Lupinus wyethii</i>	0-10	-
	rush skeletonplant	LYJU	<i>Lygodesmia juncea</i>	0-10	-
	plains pricklypear	OPPO	<i>Opuntia polyacantha</i>	0-10	-
	spiny phlox	PHHO	<i>Phlox hoodii</i>	0-10	-
	lemon scurfspea	PSLA3	<i>Psoralidium lanceolatum</i>	0-10	-
	veiny dock	RUVE2	<i>Rumex venosus</i>	0-10	-
	scarlet globemallow	SPCO	<i>Sphaeralcea coccinea</i>	0-10	-
Shrub/Vine					
7				10-29	
	skunkbush sumac	RHTR	<i>Rhus trilobata</i>	10-29	-
8				10-29	
	Shrub (>.5m)	2SHRUB	<i>Shrub (>.5m)</i>	0-10	-
	silver sagebrush	ARCA13	<i>Artemisia cana</i>	0-10	-
	Wyoming big sagebrush	ARTRW8	<i>Artemisia tridentata</i> ssp. <i>wyomingensis</i>	0-10	-
	yellow rabbitbrush	CHVI8	<i>Chrysothamnus viscidiflorus</i>	0-10	-
	rubber rabbitbrush	ERNA10	<i>Ericameria nauseosa</i>	0-10	-
	soapweed yucca	YUGL	<i>Yucca glauca</i>	0-10	-

Animal community

Animal Community – Wildlife Interpretations

Historic Climax Plant Community: 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. Other birds that would frequent this plant community include western meadowlarks, horned larks, and golden eagles. Many grassland obligate small mammals would occur here.

Yucca/ Indian Ricegrass: These communities provide foraging for antelope and other grazers. They may be used as a foraging site by sage grouse if proximal to woody cover.

Perennial Grass/Mixed Shrub: These communities provide foraging for antelope and other grazers. They may be used as a foraging site by sage grouse if proximal to woody cover.

Blowout Dune/Mixed Shrub Plant Community: This plant community can provide winter foraging for mule deer and antelope, as shrubs can approach 15% protein and 40-60% digestibility during that time. This community provides escape and thermal cover for large ungulates.

Needleandthread/Threadleaf Sedge/Skunkbush Sumac Plant Community: These communities provide 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 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 75-250 .08

Yucca/ Indian Ricegrass 75-250 .07

Perennial Grass/Mixed Shrub 50-200 .05

Blowout Dune/Mixed Shrub 35-175 .02

Needleandthread/Threadleaf Sedge/Skunkbush S. 50-180 .03

* - 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 B and C. Infiltration ranges from rapid to very rapid. 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 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:** Rills should not be present

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

-
3. **Number and height of erosional pedestals or terracettes:** Essentially non-existent
-
4. **Bare ground from Ecological Site Description or other studies (rock, litter, lichen, moss, plant canopy are not bare ground):** Bare ground is 30-50% 40-60% occurring in small areas throughout site
-
5. **Number of gullies and erosion associated with gullies:** Active gullies should not be present Active gullies should be restricted to areas of concentrated water flow patterns on steeper slopes
-
6. **Extent of wind scoured, blowouts and/or depositional areas:** Active blowouts should not be present Small scoured sites may be observed
-
7. **Amount of litter movement (describe size and distance expected to travel):** Little to no plant litter movement. Plant litter remains in place and is not moved by erosional forces.
-
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. Soil Stability class is anticipated to be 4 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:** Grass canopy and basal cover should reduce raindrop impact and slow overland flow providing increased time for infiltration to occur. Healthy deep rooted native grasses enhance infiltration and reduce runoff. Infiltration is Moderately rapid to Very Rapid.
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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 or soil surface crusting should be present.
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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:
- Sub-dominant:
- Other:
- Additional: Tall and Mid stature Grasses >> Shrubs > Forbs > Short stature grasses/grasslikes

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 0.25 inches

15. **Expected annual annual-production (this is TOTAL above-ground annual-production, not just forage annual-production):** 175 lbs/ac

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:** Threadleaf sedge, Badlands mules-ear, Threeawns, Yucca, Skunkbush sumac, Annuals, Exotics, and Species found on Noxious Weed List

17. **Perennial plant reproductive capability:** All species are capable of reproducing
