

Ecological site R032XY212WY
Gravelly (Gr)
5-9" Wind River Basin Precipitation Zone

Accessed: 08/20/2026

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

R032XY222WY	Loamy (Ly) 5-9" Wind River Basin Precipitation Zone
R032XY250WY	Sandy (Sy) 5-9" Wind River Basin Precipitation Zone
R032XY262WY	Shallow Loamy (SwLy) 5-9" Wind River Basin Precipitation Zone
R032XY266WY	Shallow Sandy (SwSy) 5-9" Wind River Basin Precipitation Zone

Similar sites

R032XY312WY	Gravelly (Gr) 10-14" East Precipitation Zone Gravelly 10-14" East P.Z. has higher production.
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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) Alluvial fan (2) Hill (3) Plateau
Flooding frequency	None
Ponding frequency	None
Elevation	1,370 – 2,010 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)	180 days
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Freeze-free period (average)	190 days
Precipitation total (average)	230 mm

Influencing water features

Stream Type: None

Soil features

The soils of this site are moderately deep (greater than 20" to bedrock) to very deep, well to excessively well-drained soils that formed in alluvium or alluvium over residuum. These soils have moderately rapid, or rapid permeability. The surface soil will vary from 3 to 6 inches deep. The coarser topsoils may be included if underlain by finer textured subsoil. The soil characteristic most influential to the plant community is a high volume of coarse fragments on the surface and in the profile, which reduces plant density and available moisture.

Major Soil Series correlated to this site include: Clifsand

Table 4. Representative soil features

Surface texture	(1) Fine sandy loam (2) Sandy loam (3) Loam
Family particle size	(1) Loamy
Drainage class	Well drained to excessively drained
Permeability class	Moderately rapid to rapid
Soil depth	50 – 150 cm
Surface fragment cover <=3"	20 – 50 %
Surface fragment cover >3"	0 – 10 %
Available water capacity (0-101.6cm)	3.56 – 12.19 cm
Calcium carbonate equivalent (0-101.6cm)	0 – 30 %

Electrical conductivity (0-101.6cm)	Not specified
Sodium adsorption ratio (0-101.6cm)	0 – 10
Soil reaction (1:1 water) (0-101.6cm)	7.4 – 8.4
Subsurface fragment volume <=3" (Depth not specified)	10 – 40 %
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, big sagebrush, rubber and green rabbitbrush and a variety of forbs. The expected potential composition for this site is about 70% grasses, 15% 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 threadleaf sedge, blue grama, big sagebrush, shadscale saltbush, and rubber rabbitbrush will increase. Weedy annuals will invade. Mid grasses such as bluebunch wheatgrass, 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.

State and transition model

Additional community tables

Table 5. Community 1.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production ()	Foliar Cover (%)
Grass/Grasslike					
1				45-90	
	Montana wheatgrass	ELAL7	<i>Elymus albicans</i>	45-90	–
	bluebunch wheatgrass	PSSP6	<i>Pseudoroegneria spicata</i>	45-90	–
2				22-45	
	western wheatgrass	PASM	<i>Pascopyrum smithii</i>	22-45	–

3				22-45	
	Indian ricegrass	ACHY	<i>Achnatherum hymenoides</i>	22-45	–
4				11-22	
	needle and thread	HECO26	<i>Hesperostipa comata</i>	11-22	–
5				11-34	
	Grass, perennial	2GP	<i>Grass, perennial</i>	0-11	–
	Fendler threeawn	ARPUL	<i>Aristida purpurea</i> var. <i>longiseta</i>	0-11	–
	blue grama	BOGR2	<i>Bouteloua gracilis</i>	0-11	–
	threadleaf sedge	CAFI	<i>Carex filifolia</i>	0-11	–
	squirreltail	ELELE	<i>Elymus elymoides</i> ssp. <i>elymoides</i>	0-11	–
	prairie Junegrass	KOMA	<i>Koeleria macrantha</i>	0-11	–
	Sandberg bluegrass	POSE	<i>Poa secunda</i>	0-11	–
Forb					
6				22-34	
	Forb, perennial	2FP	<i>Forb, perennial</i>	0-11	–
	Franklin's sandwort	ARFR	<i>Arenaria franklinii</i>	0-11	–
	prairie sagewort	ARFR4	<i>Artemisia frigida</i>	0-11	–
	woollypod milkvetch	ASPU9	<i>Astragalus purshii</i>	0-11	–
	wavyleaf Indian paintbrush	CAAPM	<i>Castilleja applegatei</i> ssp. <i>martinii</i>	0-11	–
	miner's candle	CRVI4	<i>Cryptantha virgata</i>	0-11	–
	little larkspur	DEBI	<i>Delphinium bicolor</i>	0-11	–
	cutleaf daisy	ERCO4	<i>Erigeron compositus</i>	0-11	–
	fleabane	ERIGE2	<i>Erigeron</i>	0-11	–
	sulphur-flower buckwheat	ERUM	<i>Eriogonum umbellatum</i>	0-11	–
	plains pricklypear	OPPO	<i>Opuntia polyacantha</i>	0-11	–
	nailwort	PARON	<i>Paronychia</i>	0-11	–
	fuzzytongue penstemon	PEER	<i>Penstemon eriantherus</i>	0-11	–
	waxleaf penstemon	PENI3	<i>Penstemon nitidus</i>	0-11	–
	spiny phlox	PHHO	<i>Phlox hoodii</i>	0-11	–
	lemon scurfpea	PSLA3	<i>Psoraleidium lanceolatum</i>	0-11	–
	scarlet globemallow	SPCO	<i>Sphaeralcea coccinea</i>	0-11	–
	thrift mock goldenweed	STARA	<i>Stenotus armerioides</i> var. <i>armerioides</i>	0-11	–
Shrub/Vine					
7				0-11	
	Wyoming big sagebrush	ARTRW8	<i>Artemisia tridentata</i> ssp. <i>wyomingensis</i>	0-11	–
8				0-11	
	winterfat	KRASC	<i>Krascheninnikovia</i>	0-11	–
9				22-45	
	Shrub (>.5m)	2SHRUB	<i>Shrub (>.5m)</i>	0-11	–
	shadscale saltbush	ATCO	<i>Atriplex confertifolia</i>	0-11	–
	yellow rabbitbrush	CHVI8	<i>Chrysothamnus viscidiflorus</i>	0-11	–
	rubber rabbitbrush	ERNA10	<i>Ericameria nauseosa</i>	0-11	–
	soapweed yucca	YUGL	<i>Yucca glauca</i>	0-11	–

Table 6. Community 2.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production ()	Foliar Cover (%)
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Table 7. Community 3.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production ()	Foliar Cover (%)
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Table 8. Community 4.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production ()	Foliar Cover (%)
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Animal community

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 100-300 .08 Perennial Grass/Mixed Shrub 75-200 .06 Mixed Shrub/Bare Ground 50-175 .03 Threadleaf Sedge &/or B. Grama Sod/ B.G. 25-75 .02 * - 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, with localized areas in hydrologic group C. Infiltration potential for this site varies from moderately rapid to rapid depending on soil hydrologic group and ground cover. Runoff varies from low to moderate. 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

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. Inventory Data References Ocular field estimations observed by trained personnel.

Contributors

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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	
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 slope < 9% to common on slopes > 25%

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

- 3. Number and height of erosional pedestals or terracettes:** Not evident on slopes < 9% present on slopes > 9%

- 4. Bare ground from Ecological Site Description or other studies (rock, litter, lichen, moss, plant canopy are not bare ground):**
Bare ground is 10-20%. 20-50% of soil surface is coarse fragments

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

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

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

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 40% 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. Infiltration varies with soil texture from moderately rapid to rapid.

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.

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 Bunch Grasses > mid stature rhizomatous & short grasses > Shrubs > Forbs >

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

14. Average percent litter cover (%) and depth (in): Average litter cover is 10-15% with depths of 0.10 to 0.25 inches

15. Expected annual annual-production (this is TOTAL above-ground annual-production, not just forage annual-production):
200 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, blue grama, big sagebrush, shadscale saltbush, rubber rabbitbrush, annuals, exotics, and Species found on Noxious Weed List

17. Perennial plant reproductive capability: May be Limited due to effective moisture and seed to soil contact
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