

Ecological site R034AY246WY
Sands
Foothills and Basins West (Sa)

Accessed: 08/17/2026

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

R034AY250WY	Sandy Foothills and Basins West (Sy) Sandy
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Similar sites

R034AY146WY	Sands Green River and Great Divide Basins (Sa) Sands 7-9GR has lower production.
R034AY250WY	Sandy Foothills and Basins West (Sy) Sandy 10-14W has lower production and shorter shrub height.

Table 1. Dominant plant species

Tree	Not specified
Shrub	Not specified
Herbaceous	Not specified

Physiographic features

This site usually occurs in an upland position on rolling to very rough topography. Slopes are commonly 10 to 30%, and elevations are mostly above 7000 feet.

Table 2. Representative physiographic features

Landforms	(1) Ridge (2) Hill
Flooding frequency	None

Ponding frequency	None
Elevation	1,980 – 2,290 m
Slope	10 – 60 %
Ponding depth	0 cm
Aspect	Aspect is not a significant factor

Climatic features

Annual precipitation ranges from 10-14 inches per year. 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. This is predominantly due to the high elevation and dry air, which permits rapid incoming and outgoing radiation. Cold air outbreaks in winter move rapidly from northwest to southeast and account for extreme minimum temperatures. Extreme storms may occur during the winter, but most severely affect ranch operations during late winter and spring.

Daytime winds are generally stronger than nighttime and occasional strong storms may bring brief periods of high winds with gusts to more than 50 mph.

Growth of native cool season plants begins about April 15 and continues to about August 15. Some green up of cool season plants usually occurs in September depending upon fall moisture occurrences.

For detailed information visit the Natural Resources Conservation Service National Water and Climate Center at <http://www.wcc.nrcs.usda.gov/cgibin/state.pl?state=wy> website. Other climate stations representative of this precipitation zone include "Border 3 N " and Kemmerer Wtr Trtmt" in Lincoln County; "Evanston 1 E" in Uinta County; and "Merna" in Sublette County.

Table 3 Representative climatic features

Frost-free period (average)	70 days
Freeze-free period (average)	100 days
Precipitation total (average)	360 mm

Influencing water features

There are no water features associated with this site.

Soil features

The soils of this site formed primarily in aeolian deposits and less commonly in residuum. They are deep and moderately deep sandy soils. This soil can develop into active sand dunes with the deterioration of cover. The parent material is eolian sands, outwash, and residuum.

Major soil series correlated to this site include: Coyet, Zeomont and a moist phase of the Bodorumpe series.

Table 4. Representative soil features

Surface texture	(1) Fine sand (2) Loamy fine sand
Family particle size	(1) Sandy
Drainage class	Well drained to somewhat excessively drained
Permeability class	Moderately rapid to rapid
Soil depth	50 – 150 cm
Surface fragment cover <=3"	Not specified
Surface fragment cover >3"	Not specified
Available water capacity (0-101.6cm)	3.05 – 6.35 cm
Calcium carbonate equivalent (0-101.6cm)	0 – 10 %
Electrical conductivity (0-101.6cm)	0 – 10 mmhos/cm
Sodium adsorption ratio (0-101.6cm)	0 – 10
Soil reaction (1:1 water) (0-101.6cm)	6.1 – 7.8
Subsurface fragment volume <=3" (Depth not specified)	0 – 10 %
Subsurface fragment volume >3" (Depth not specified)	Not specified

Ecological dynamics

As this site deteriorates from improper grazing management, woody species such as basin big sagebrush and rabbitbrush will increase. Bunchgrasses such as Indian ricegrass and needleandthread will decrease in frequency and production.

These plant communities narratives 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.

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				235-549	
	needle and thread	HECO26	<i>Hesperostipa comata</i>	235-549	–
	needle and thread	HECO26	<i>Hesperostipa comata</i>	235-549	–
2				157-392	
	Indian ricegrass	ACHY	<i>Achnatherum hymenoides</i>	157-392	–
3				78-157	
	thickspike wheatgrass	ELLAL	<i>Elymus lanceolatus ssp. lanceolatus</i>	78-157	–
4				78-157	
	squirreltail	ELEL5	<i>Elymus elymoides</i>	78-157	–
5				157-314	
	Grass, perennial	2GP	<i>Grass, perennial</i>	0-78	–
	needleleaf sedge	CADU6	<i>Carex duriuscula</i>	0-78	–
	prairie Junegrass	KOMA	<i>Koeleria macrantha</i>	0-78	–
	Sandberg bluegrass	POSE	<i>Poa secunda</i>	0-78	–
	bluebunch wheatgrass	PSSP6	<i>Pseudoroegneria spicata</i>	0-78	–
Forb					
6				78-235	
	Forb, perennial	2FP	<i>Forb, perennial</i>	0-78	–
	common yarrow	ACMI2	<i>Achillea millefolium</i>	0-78	–
	rosy pussytoes	ANRO2	<i>Antennaria rosea</i>	0-78	–
	sandwort	ARENA	<i>Arenaria</i>	0-78	–
	milkvetch	ASTRA	<i>Astragalus</i>	0-78	–
	bastard toadflax	COUM	<i>Comandra umbellata</i>	0-78	–
	fleabane	ERIGE2	<i>Erigeron</i>	0-78	–

	buckwheat	ERIOG	<i>Eriogonum</i>	0-78	–
	aster	EUCEP2	<i>Eucephalus</i>	0-78	–
	granite prickly phlox	LIPU11	<i>Linanthus pungens</i>	0-78	–
	desertparsley	LOMAT	<i>Lomatium</i>	0-78	–
	bluebells	MERTE	<i>Mertensia</i>	0-78	–
	beardtongue	PENST	<i>Penstemon</i>	0-78	–
	phacelia	PHACE	<i>Phacelia</i>	0-78	–
	buttercup	RANUN	<i>Ranunculus</i>	0-78	–
	scarlet globemallow	SPCO	<i>Sphaeralcea coccinea</i>	0-78	–
	clover	TRIFO	<i>Trifolium</i>	0-78	–
	deathcamas	ZIGAD	<i>Zigadenus</i>	0-78	–
Shrub/Vine					
7				78-157	
	basin big sagebrush	ARTRT	<i>Artemisia tridentata ssp. tridentata</i>	78-157	–
8				78-235	
	silver sagebrush	ARCAC5	<i>Artemisia cana ssp. cana</i>	0-78	–
	prairie sagewort	ARFR4	<i>Artemisia frigida</i>	0-78	–
	fourwing saltbush	ATCA2	<i>Atriplex canescens</i>	0-78	–
	yellow rabbitbrush	CHVI8	<i>Chrysothamnus viscidiflorus</i>	0-78	–
	rubber rabbitbrush	ERNA10	<i>Ericameria nauseosa</i>	0-78	–
	winterfat	KRLA2	<i>Krascheninnikovia lanata</i>	0-78	–
	antelope bitterbrush	PUTR2	<i>Purshia tridentata</i>	0-78	–

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

Animal Community – Wildlife Interpretations Needleandthread/Basin Big Sagebrush Plant Community: This plant community provides suitable thermal and escape cover for mule deer and elk. Sagebrush, which can approach 15% protein and 40-60% digestibility, provides important winter forage for mule deer and antelope. Year-round habitat is provided for sage grouse and many other sagebrush obligate species such as the sage sparrow, Brewer's sparrow, sage thrasher, pygmy rabbit, sagebrush vole, horned lizard, and pronghorn antelope. Other birds that would frequent this plant community include horned larks and golden eagles. Basin Big Sagebrush/Bunchgrass Plant Community: This plant community may be useful for the same wildlife that would use the Historic Climax Plant Community. Basin Big Sagebrush/Rhizomatous Wheatgrass Plant Community: These communities are unstable due to moving sand dunes. They provide a unique temporary habitat for some small mammals and birds. Rabbitbrush/Rhizomatous Wheatgrass Plant Community: These communities are unstable due to moving sand dunes. They provide a unique temporary habitat for some small mammals and birds.

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. Plant Community Production (lb./ac) and Carrying Capacity* (AUM/ac)

Needleandthread/Basin Big Sagebrush (HCPC) 900-1700 lb./ac and .45 AUM/ac Basin Big Sagebrush/Bunchgrass 500-1300 lb./ac and .3 AUM/ac Basin Big Sagebrush/Rhizomatous Wheatgrass 200-1000 lb./ac and .2 AUM/ac Rabbitbrush/ Rhizomatous Wheatgrass 100-700 lb./ac and .1 AUM/ac * - 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 A, with localized areas in hydrologic group B. Infiltration potential for this site varies from moderately rapid to very rapid depending on soil hydrologic group and ground cover. Runoff varies from very low to moderately low (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. Litter typically falls in place, and signs of movement are not common. Chemical and physical crusts are rare to non-existent.

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. The sandy nature of the soils appeals to Off-Road Vehicle (ORV) users.

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 clipping data and other inventory data. Field observations from range trained personnel were also used. Those involved in developing this site include: Bill Christensen, Range Management Specialist, NRCS; Karen Clause, 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, and USDA NRCS Soil Surveys from various counties.

Contributors

Karen Clause

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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Approved by	
Approval date	

Composition (Indicators 10 and 12) based on	Annual Production
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Indicators

1. **Number and extent of rills:** Rare to nonexistent.

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:** Wind scouring and deposition evident and associated with dune topography typical of this site.

7. **Amount of litter movement (describe size and distance expected to travel):** Herbaceous litter expected to move due to wind. 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 2.5 or greater.

9. **Soil surface structure and SOM content (include type of structure and A-horizon color and thickness):** Currently no soil series are correlated to this ecological site. Soil OM of less than 1% is expected.

10. **Effect of community phase composition (relative proportion of different functional groups) and spatial distribution on infiltration and runoff:** Plant community consists of 60-75% grasses, 15% forbs, and 10-25% shrubs. Evenly distributed plant canopy (40-60%) and litter plus rapid infiltration rates result in 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.

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

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 10-25% of total canopy measurement with total litter (including beneath the plant canopy) from 20-50% expected. Herbaceous litter depth typically rangew 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: 900-1700 lb/ac (1400 lb/ac average); Metric 1008-1904 kg/ha (1568 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 60% is the most common indicator of a threshold being crossed. Rabbitbrush, basin big sagebrush, rhizomatous wheatgrasses, and sage gilia are common increasers.
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17. **Perennial plant reproductive capability:** All species are capable of reproducing, except in drought years.
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