

# Ecological site R049XA134WY Rocky Hills (Foothills and Mountains Southeast)

Accessed: 05/07/2024

## 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.

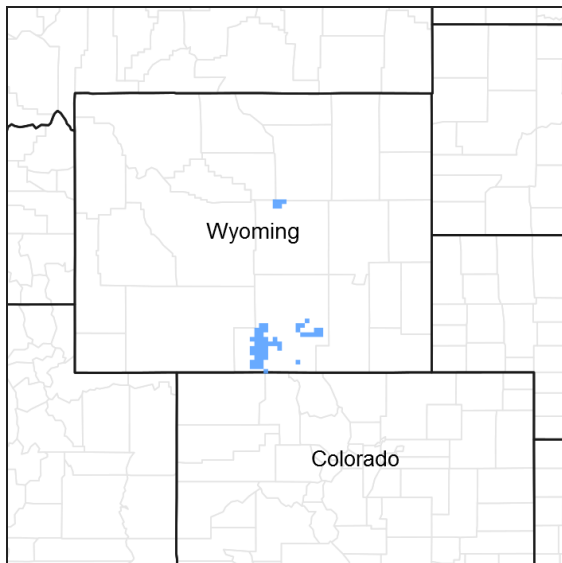


Figure 1. Mapped extent

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

R049XA122WY	<b>Loamy (Foothills and Mountains Southeast)</b> Loamy 15-19" P.Z.
R049XA162WY	<b>Shallow Loamy (Foothills and Mountains Southeast)</b> Shallow Loamy 15-19" P.Z.
R049XA176WY	<b>Very Shallow (Foothills and Mountains Southeast)</b> Very Shallow 15-19" P.Z.

## Similar sites

R049XA122WY	<b>Loamy (Foothills and Mountains Southeast)</b> Loamy 15-19" P.Z. is more productive
R049XA162WY	<b>Shallow Loamy (Foothills and Mountains Southeast)</b> Shallow Loamy 15-19" P.Z. has far less mountainmahogany
R049XA176WY	<b>Very Shallow (Foothills and Mountains Southeast)</b> Very Shallow 15-19" P.Z. has far less mountainmahogany and less production

Table 1. Dominant plant species

Tree	Not specified
Shrub	Not specified
Herbaceous	Not specified

## Physiographic features

This site occurs on nearly level to steeply sloping uplands.

**Table 2. Representative physiographic features**

Landforms	(1) Hill (2) Alluvial fan
Flooding frequency	None
Ponding frequency	None
Elevation	1,981–2,591 m
Slope	0–50%
Ponding depth	0 cm
Aspect	Aspect is not a significant factor

## Climatic features

Annual precipitation ranges from 15-19 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.

Prevailing winds are from the southwest and strong winds are less frequent than over other areas of Wyoming. Occasional storms, however, can bring brief periods of high winds with gusts exceeding 50 mph.

Growth of native cool season plants begins about May 1 and continues to about August 1.

The following information is from the “Hecla 1E” climate station:

Minimum Maximum 5 yrs. out of 10 between  
 Frost-free period (days): 93 151 May 20 – September 14  
 Freeze-free period (days): 106 184 May 9 – September 26  
 Annual Precipitation (inches): 9.56 24.23

Mean annual precipitation: 16.04 inches

Mean annual air temperature: 44.7F (32.1F Avg. Min. to 57.2F 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 “Glenrock 14 SSE”, “Foxpark” and “Horse Creek 2 NW”.

**Table 3. Representative climatic features**

Frost-free period (average)	151 days
Freeze-free period (average)	184 days
Precipitation total (average)	483 mm

## Influencing water features

### Soil features

The soils of this site are shallow to very deep and well drained. They formed on alluvium, colluvium and residuum and have moderate permeability.

Major soil series correlated to this site:

Other series correlated to this site:

**Table 4. Representative soil features**

Surface texture	(1) Cobbly loam (2) Very channery clay loam (3) Extremely channery
Family particle size	(1) Loamy
Drainage class	Well drained
Permeability class	Moderate to moderately rapid
Soil depth	51–152 cm
Surface fragment cover <=3"	10–40%
Surface fragment cover >3"	10–40%
Available water capacity (0-101.6cm)	1.78–2.54 cm
Calcium carbonate equivalent (0-101.6cm)	0–35%
Electrical conductivity (0-101.6cm)	0–2 mmhos/cm
Sodium adsorption ratio (0-101.6cm)	0–3
Soil reaction (1:1 water) (0-101.6cm)	6.6–8.4
Subsurface fragment volume <=3" (Depth not specified)	10–60%
Subsurface fragment volume >3" (Depth not specified)	10–60%

### Ecological dynamics

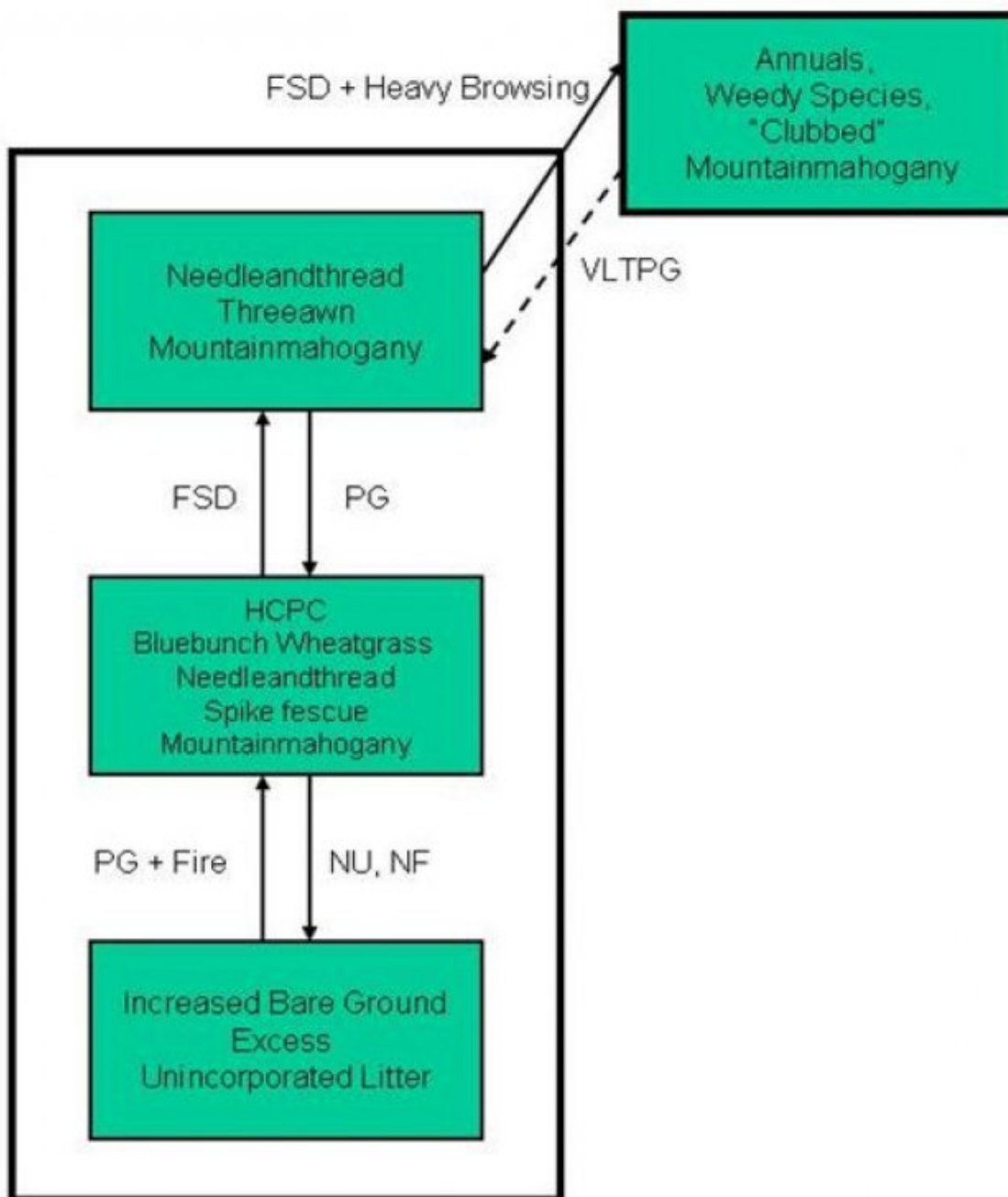
As this site begins to deteriorate from a combination of frequent and severe grazing during the growing season, grasses such as bluebunch wheatgrass and spike fescue will decrease in both frequency and production. Grasses such as Fendler's threeawn, Sandberg bluegrass and threadleaf sedge will increase. Under continued frequent and severe defoliation, with no rest periods, rhizomatous wheatgrasses and needleandthread will also begin to decrease. If continued, the plant community will become sparsely vegetated, and all mid to tall grasses can eventually be removed from the plant community. Continuous use in combination with high stock densities will result in areas of excessive bare ground and species such as cheatgrass, Japanese brome, pepperweed and broom snakeweed invading. Lack of fire on this site will cause the mountainmahogany to become decadent and the crude protein levels of the plant will drop. If this occurs, the stands of mountainmahogany will not provide adequate winter-feed for wildlife, such as mule deer and elk.

The historic climax plant community (description follows the State and Transition Model 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 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**



**FSD** - Frequent and Severe Defoliation

**HCPC** - Historic Climax Plant Community

**PG** - Prescribed Grazing (proper stocking rates with adequate recovery periods during the growing season.)

**VLTPG** - Very Long-term Prescribed Grazing

**NU, NF** - No Use, No Fire.

## State 1

### Bluebunch Wheatgrass, Needleandthread, Spike fescue, Mountainmahogany Plant Community

#### Community 1.1

### Bluebunch Wheatgrass, Needleandthread, Spike fescue, Mountainmahogany Plant Community

This plant community is the interpretive plant community for this site and is considered to be the Historic Climax Plant Community (HCPC). The site evolved with grazing by large herbivores and is suited to grazing by domestic livestock. Historically, fires likely occurred frequently. Suppression of fire in the last 100 years has caused a decrease in the quality of this site for wildlife winter range. This plant community can be found on areas that are grazed and where the grazed plants receive adequate periods of rest during the growing season in order to recover. The potential vegetation is about 55% grasses, 10% forbs, and 45% woody plants. Mid-grasses and woody plants co-dominate the site. The principal grasses are bluebunch wheatgrass, needleandthread and spike fescue. Secondary grasses are Canby bluegrass, Fendler's threeawn and western wheatgrass. Other plants in the community are antelope bitterbrush, currant and western snowberry. The diversity of plant species allows for high dry tolerance and a sustainable plant community. Soil erosion and runoff is moderate due to texture and topography. Infiltration is moderate because of soil texture and topography. Areas having lost all vegetation, such as livestock and vehicle trails are subject to high erosion rates and extreme runoff. The total annual production (air-dry weight) of this state is about 900 lbs./acre, but it can range from about 650 lbs./acre in unfavorable years to about 1,150 lbs./acre in above average years. The following is the growth curve of this plant community expected during a normal year: Growth curve number: Growth curve name: Growth curve description: JAN FEB MAR APR MAY JUN JUL AUG SEP OCT NOV DEC 0 0 0 5 20 45 20 5 5 0 0 0 (Monthly percentages of total annual growth) Transitions or pathways leading to other plant communities are as follows: Frequent and severe defoliation of mid-grasses will move this plant community to the Needleandthread, Threeawn, Mountainmahogany Plant Community. The highly palatable plants are removed causing a decrease in diversity and productivity. No Use and No Fire will move this plant community to the Increased Bare Ground, Excess Unincorporated Litter Plant Community. Lack of use causes the plants to become less vigorous, crowns of plants begin to die, and plant canopy begins to open up with more bare ground apparent.

Figure 4. Plant community growth curve (percent production by month). WY1001, 15-19SE upland sites.

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0	0	0	5	20	45	20	5	5	0	0	0

## State 2

### Needleandthread, Threeawn, Mountainmahogany Plant Community

#### Community 2.1

### Needleandthread, Threeawn, Mountainmahogany Plant Community

This plant community developed with frequent and severe defoliation during the growing season. The dominant grasses include needleandthread and Fendler's threeawn. Threadleaf sedge and Sandberg bluegrass begin to increase. Bluebunch wheatgrass is still present as a secondary grass in the community. Significant forbs include phlox, buckwheats, and western yarrow. The dominant shrub is mountainmahogany. Other plants are fringed sagewort and pricklypear cactus. Compared to HCPC, bluebunch wheatgrass and spike fescue have decreased. Needleandthread, Fendler's threeawn and undesirable forbs have increased. Management changes cannot easily move this plant community toward HCPC. Soil erosion is moderate. Infiltration is minimal because runoff is high. Areas that are devoid of vegetation are subject to extreme erosion and runoff. The total annual production (air-dry weight) is about 700 pounds per acre during an average year, but it can range from about 550 pounds per acre in unfavorable years to about 850 pounds per acre in above average years. The following is the growth curve of this plant community expected during a normal year: Growth curve number: Growth curve name: Growth curve description: JAN FEB MAR APR MAY JUN JUL AUG SEP OCT NOV DEC 0 0 0 5 20 45 20 5 5 0 0 0 (Monthly percentages of total annual growth) Transitions or pathways leading to other plant communities are as follows: Frequent and severe defoliation of mid-grasses + heavy browsing of mountainmahogany will move this plant

community to the Annuals, Weedy Species, and “Clubbed” Mountainmahogany Plant Community. Weedy species are starting to invade, and almost all mid-grasses are removed resulting in a decrease in palatable forage. Fire has been removed and shrubs are becoming decadent. Prescribed Grazing will shift this plant community towards the Bluebunch Wheatgrass, Needleandthread, Spike fescue, Mountainmahogany Plant Community (HCPC). The advantage of having this plant community at HCPC is increased desirable plant diversity, production and soil organic matter.

**Figure 5. Plant community growth curve (percent production by month). WY1001, 15-19SE upland sites.**

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0	0	0	5	20	45	20	5	5	0	0	0

### **State 3 Increased Bare Ground, Excess Unincorporated Litter Plant Community**

#### **Community 3.1 Increased Bare Ground, Excess Unincorporated Litter Plant Community**

This plant community developed under many years with no defoliation and no fire. Plant litter accumulates in large amounts when this community first develops. Eventually, litter levels become high enough to crowd out plants and more of the area becomes bare ground. Bunchgrasses develop dead centers and rhizomatous wheatgrasses form small communities because of a lack of stimulation by grazers. The dominant grasses/grasslikes include needleandthread, Fendler’s threeawn and western wheatgrass. Compared to the HCPC bluebunch wheatgrass, spike fescue, and perennial forbs have decreased and noxious weeds have started to invade. The lack of fire causes the mountainmahogany to become decadent and crude protein levels to decrease. Management changes can easily shift this plant community. Soil erosion is low when the surface litter is high, but increases when the litter disappears. Areas that are devoid of vegetation are subject to high erosion by wind and water. The total annual production (air-dry weight) is about 750 pounds per acre during an average year, but it can range from about 600 pounds per acre in unfavorable years to about 900 pounds per acre in above average years. The following is the growth curve of this plant community expected during a normal year: Growth curve number: Growth curve name: Growth curve description: JAN FEB MAR APR MAY JUN JUL AUG SEP OCT NOV DEC 0 0 0 5 20 45 20 5 5 0 0 0 0 (Monthly percentages of total annual growth) Transitions or pathways leading to other plant communities are as follows: Prescribed Grazing + Fire will shift this plant community towards the Bluebunch Wheatgrass, Needleandthread, Spike fescue, Mountainmahogany Plant Community (HCPC). The advantage of having this Plant Community at HCPC is increased desirable plant diversity, production, plant vigor and soil organic matter.

**Figure 6. Plant community growth curve (percent production by month). WY1001, 15-19SE upland sites.**

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0	0	0	5	20	45	20	5	5	0	0	0

### **State 4 Annuals, Weedy Species, “Clubbed’ Mountainmahogany Plant Community**

#### **Community 4.1 Annuals, Weedy Species, “Clubbed’ Mountainmahogany Plant Community**

This plant community developed under frequent and severe defoliation during the growing season. The dominant grasses include mountainmahogany, annual grasses such as cheatgrass and Japanese brome, annual forbs and other weedy species. At this time the plant community is highly prone to invasion by noxious weeds. Mid-grasses have been almost completely removed from the understory. The dominant forbs are western yarrow, phlox, and broom snakeweed. Other plants are fringed sagewort and pricklypear cactus. Compared to HCPC, nearly all mid-grasses are gone and weedy species have invaded the area. Undesirable grasses, forbs and other plants have increased. Management changes cannot easily move this plant community toward HCPC. Soil erosion is severe. Infiltration is minimal because runoff is high. Areas that are devoid of vegetation are subject to extreme erosion and runoff. The total annual production (air-dry weight) is about 400 pounds per acre during an average year, but it can

range from about 300 pounds per acre in unfavorable years to about 500 pounds per acre in above average years. The following is the growth curve of this plant community expected during a normal year: Growth curve number: Growth curve name: Growth curve description: JAN FEB MAR APR MAY JUN JUL AUG SEP OCT NOV DEC 0 0 0 5 20 45 20 5 5 0 0 0 (Monthly percentages of total annual growth) Transitions or pathways leading to other plant communities are as follows: Very Long Term Prescribed Grazing will move this plant community towards the Needleandthread, Threeawn, Mountainmahogany Plant Community. Moving towards HCPC will increase production, desirable plant diversity and reduce soil erosion.

Figure 7. Plant community growth curve (percent production by month). WY1001, 15-19SE upland sites.

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0	0	0	5	20	45	20	5	5	0	0	0

## Additional community tables

Table 5. Community 1.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production (Kg/Hectare)	Foliar Cover (%)
<b>Grass/Grasslike</b>					
1				252–706	
	bluebunch wheatgrass	PSSP6	<i>Pseudoroegneria spicata</i>	151–303	–
	needle and thread	HECO26	<i>Hesperostipa comata</i>	101–202	–
	spike fescue	LEKI2	<i>Leucopoa kingii</i>	101–202	–
2				101–202	
	Grass, perennial	2GP	<i>Grass, perennial</i>	0–50	–
	Indian ricegrass	ACHY	<i>Achnatherum hymenoides</i>	0–50	–
	Fendler's threeawn	ARPUF	<i>Aristida purpurea var. fendleriana</i>	0–50	–
	threadleaf sedge	CAFI	<i>Carex filifolia</i>	0–50	–
	prairie Junegrass	KOMA	<i>Koeleria macrantha</i>	0–50	–
	mountain muhly	MUMO	<i>Muhlenbergia montana</i>	0–50	–
	western wheatgrass	PASM	<i>Pascopyrum smithii</i>	0–50	–
	Sandberg bluegrass	POSE	<i>Poa secunda</i>	0–50	–
<b>Forb</b>					
3				101–202	
	Forb, perennial	2FP	<i>Forb, perennial</i>	0–50	–
	yarrow	ACHIL	<i>Achillea</i>	0–50	–
	prairie sagewort	ARFR4	<i>Artemisia frigida</i>	0–50	–
	milkvetch	ASTRA	<i>Astragalus</i>	0–50	–
	fleabane	ERIGE2	<i>Erigeron</i>	0–50	–
	buckwheat	ERIOG	<i>Eriogonum</i>	0–50	–
	beardtongue	PENST	<i>Penstemon</i>	0–50	–
	spiny phlox	PHHO	<i>Phlox hoodii</i>	0–50	–
<b>Tree</b>					
4				202–404	
	alderleaf mountain mahogany	CEMO2	<i>Cercocarpus montanus</i>	202–404	–
5				10–101	



	antelope bitterbrush	PUTR2	<i>Purshia tridentata</i>	10–101	–
6				0–50	
	Rocky Mountain juniper	JUSC2	<i>Juniperus scopulorum</i>	0–50	–
7				0–50	
	ponderosa pine	PIPO	<i>Pinus ponderosa</i>	0–50	–
<b>Shrub/Vine</b>					
8				50–151	
	Shrub (>.5m)	2SHRUB	<i>Shrub (&gt;.5m)</i>	0–50	–
	black sagebrush	ARNO4	<i>Artemisia nova</i>	0–50	–
	big sagebrush	ARTR2	<i>Artemisia tridentata</i>	0–50	–
	yellow rabbitbrush	CHV18	<i>Chrysothamnus viscidiflorus</i>	0–50	–
	currant	RIBES	<i>Ribes</i>	0–50	–
	western snowberry	SYOC	<i>Symphoricarpos occidentalis</i>	0–50	–

## Animal community

### Animal Community – Wildlife Interpretations

Bluebunch wheatgrass, Needleandthread, Spike fescue, Mountainmahogany Community (HCPC): The predominance of high grass and forb diversity plus mountainmahogany in this community favors large browsers and grazers such as deer and elk. The shrub cover provides suitable thermal and escape cover for mule deer. White-tailed and black-tailed jackrabbit, badger, and coyote commonly use this community. This community also provides habitat for a wide array of smaller mammals, so diverse prey populations are available for raptors such as ferruginous and Swainson’s hawks. Birds such as western kingbird, western meadowlark, lark bunting, and grasshopper sparrow will utilize this community for nesting and foraging. This community is especially favorable for ground-nesting birds because of the abundant residual vegetation available in the spring for nesting, escape and thermal cover.

Needleandthread, Threawn, Mountainmahogany Community: The reduction in taller grasses in this community results in decreased use by lark buntings and western meadowlarks. Killdeer, horned larks, and McCown’s longspurs will also make significant use of this community. Mule deer forage in this community.

Increased Bare Ground, Excess Unincorporated Litter Community: This community provides foraging for deer and other browsers. Ground-nesting birds favoring sparse vegetation may use this community. Generally, this is not a target vegetative community for wildlife habitat management.

Annuals, Weedy Species, “Clubbed” Mountainmahogany Community: Sparse vegetation and greater amounts of bare ground provide suitable habitat for horned larks and McCown’s longspurs. However, a lack of complex vegetation structure and residual cover makes this community poor habitat in general for most ground nesting birds and big game species. Deer and elk may find limited forage in this community.

### Animal Community – Grazing Interpretations

The following tables list suggested initial stocking rates for cattle under continuous grazing (year long grazing or growing season long grazing) under normal growing conditions; however, continuous grazing is not typically recommended. 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 the following stocking rate 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 Carrying  
Capacity (lbs./acre) (AUM/acre)

Bluebunch, Needleandthread, Spike fescue, Mountainmahogany 900 0.3  
Needleandthread, Threeawn, Mountainmahogany 700 0.2  
Increased Bare Ground, Excess Unincorporated Litter 750 0.25  
Annuals, Weedy Species, "Clubbed" Mountainmahogany 400 0.15

Grazing by domestic livestock is one of the major income-producing industries in the area. Rangelands in this area provide yearlong forage under prescribed grazing for cattle, sheep, horses and other herbivores. During the dormant period, livestock may need supplementation based on reliable forage analysis.

## **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, with localized areas in hydrologic group D. Infiltration ranges from moderately slow to moderate. Runoff potential for this site varies from moderate to moderately 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. 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, hiking, photography, bird watching and other opportunities. The wide varieties of plants that 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**

Inventory Data References (narrative)

Information presented here has been derived from NRCS clipping data and other inventory data. Field observations from range trained personnel were also used.

Inventory Data References

Data Source Number of Records Sample Period State County  
SCS-RANGE-417 24 1963 -1987 WY Albany & others

## **Other references**

Other sources used as references include: High Plains Regional Climate Center, USDA NRCS Water and Climate Center, USDA NRCS National Range and Pasture Handbook, and USDA NRCS Soil Surveys from various counties.

## **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	03/01/2005
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 40-60% occurring in small areas throughout site
- 

5. **Number of gullies and erosion associated with gullies:** 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:** Small scoured sites may be observed
- 

7. **Amount of litter movement (describe size and distance expected to travel):** Litter movement is little to none based on topography and water flow patterns
- 

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. Infiltration is moderate.
- 
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 Cool Season Bunch Grasses > Shrubs >Forbs
- 
13. **Amount of plant mortality and decadence (include which functional groups are expected to show mortality or decadence):** Very Low
- 
14. **Average percent litter cover (%) and depth ( in):** Average litter cover is 15-25% with depths of 0.25 to 0.5 inches
- 
15. **Expected annual annual-production (this is TOTAL above-ground annual-production, not just forage annual-production):** 900 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, Sandberg bluegrass, Threeawns, Broom snakeweed, Species found on Noxious Weed List
- 
17. **Perennial plant reproductive capability:** All species are capable of reproducing
-