

Ecological site R034AY212WY Gravelly Foothills and Basins West (Gr)

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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.

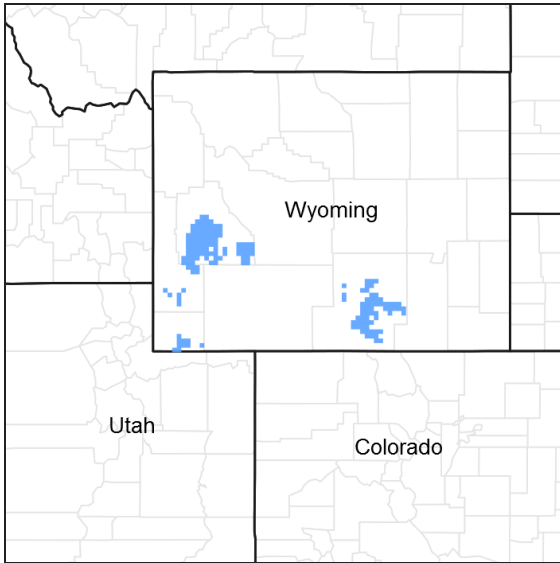


Figure 1. Mapped extent

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

R034AY258WY	Shallow Clayey Foothills and Basins West (SwCy)
R034AY262WY	Shallow Loamy Foothills and Basins West (SwLy)
R034AY276WY	Very Shallow Foothills and Basins West (VS)

Similar sites

R034AY112WY	Gravelly Green River and Great Divide Basins (Gr) Gravelly (Gr) 7-9GR has lower production.
R034AY276WY	Very Shallow Foothills and Basins West (VS) Very Shallow (VS) 10-14W lacks a high volume of coarse fragments.

Table 1. Dominant plant species

Tree	Not specified
Shrub	Not specified
Herbaceous	Not specified

Physiographic features

This site occurs along terrace breaks. It is found on all exposures, on slopes mostly from 5 to 30%, and at elevations mostly above 7000 feet.

Table 2. Representative physiographic features

Landforms	(1) Ridge (2) Escarpment (3) Hill
Flooding frequency	None
Ponding frequency	None
Elevation	1,981–2,286 m
Slope	1–70%
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)	67 days
Freeze-free period (average)	97 days
Precipitation total (average)	356 mm

Influencing water features

There are no water features associated with this site.

Soil features

The soils of this site are moderately deep to deep, well-drained soils formed in alluvium. These soils are usually fine sandy loam to sandy loam. This site usually occurs on steep slopes, but may be on any slope. They commonly have coarse fragments up to 10 inches in diameter in the surface layer and have 35 to 60 percent coarse fragments between depths of 10 to 20 inches.

Major Soil Series correlated to this site include: Attewan, Browtine, Dahlquist, Hanson, Rivra, Sevenmile, and Teeler.

Other Soil Series in MLRA 34A correlated to this site include: Abarca, Ipson, Maurice, Uracca, Pahlow, Wardboro, Redmanson, Dunul, and Zillman.

Table 4. Representative soil features

Surface texture	(1) Sandy loam (2) Fine sandy loam
Family particle size	(1) Loamy
Drainage class	Well drained to somewhat excessively drained
Permeability class	Moderately slow to moderately rapid
Soil depth	51–102 cm
Surface fragment cover <=3"	15–40%
Surface fragment cover >3"	0–10%
Available water capacity (0-101.6cm)	5.08–11.43 cm
Calcium carbonate equivalent (0-101.6cm)	0–10%
Electrical conductivity (0-101.6cm)	0–8 mmhos/cm
Sodium adsorption ratio (0-101.6cm)	0–5
Soil reaction (1:1 water) (0-101.6cm)	6.6–8.4
Subsurface fragment volume <=3" (Depth not specified)	30–50%
Subsurface fragment volume >3" (Depth not specified)	10–20%

Ecological dynamics

As this site deteriorates, species such as green rabbitbrush will increase. Cool season bunchgrasses such as bluebunch wheatgrass, Indian ricegrass, and needleandthread will decrease in frequency and production. Cheatgrass often invades. This site has relatively low productivity potential, and is not well suited to grazing improvement practices unless treated as part of a larger unit containing more productive areas.

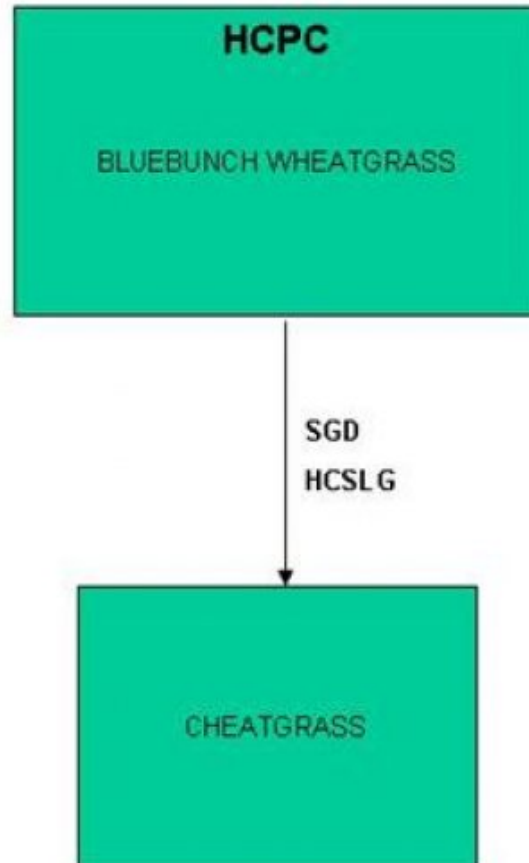
These plant communities narratives may not represent every possibility, but they probably are the most prevalent and repeatable plant communities. The plant composition tables shown above have been developed from the best available knowledge at the time of this revision. As more data is collected, some 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



BMA – Brush Management (all methods)
BMC – Brush Management (chemical)
BMF – Brush Management (fire)
BMM – Brush Management (mechanical)
CSP – Chemical Seedbed Preparation
CSLG – Continuous Season-long Grazing
DR – Drainage
CSG – Continuous Spring Grazing
HB – Heavy Browse
HCSLG – Heavy Continuous Season-long Grazing
HI – Heavy Inundation
LPG – Long-term Prescribed Grazing
MT – Mechanical Treatment (chiseling, ripping, pitting)

NF – No Fire
NS – Natural Succession
MVC – Noxious Weed Control
NWI – Noxious Weed Invasion
NU – Nonuse
P&C – Plow & Crop (including hay)
PG – Prescribed Grazing
RPT – Re-plant Trees
RS – Re-seed
SGD – Severe Ground Disturbance
SHC – Severe Hoof Compaction
WD – Wildlife Damage (Beaver)
WF – Wildfire

**State 1
Bluebunch Wheatgrass (HCPC)**

**Community 1.1
Bluebunch Wheatgrass (HCPC)**

The interpretive plant community for this site is the Historic Climax Plant Community. Potential vegetation is about 70% grasses or grass-like plants, 15% forbs, and 15% woody plants. The major grasses include bluebunch wheatgrass, Indian ricegrass, needleandthread, and rhizomatous wheatgrass. Other grasses and grass-like plants include Sandberg, Canby, and mutton bluegrass, bottlebrush squirreltail, needleleaf sedge, Letterman needlegrass, and prairie junegrass. Common woody plants include big, low, and black sagebrush, winterfat, and green rabbitbrush. A typical plant composition for this state consists of bluebunch wheatgrass 20-30%, needleandthread 10-20%, Indian ricegrass 10-20%, rhizomatous wheatgrass 5-10%, other grasses and grass-like plants 5-15%, perennial forbs 5-15%, and 5-15% woody plants. Ground cover, by ocular estimate, varies from 25-35%. The total annual production (air-dry weight) of this state is about 450 pounds per acre, but it can range from about 300 lbs./acre in unfavorable years to about 650 lbs./acre in above average years. The state is stable and well adapted to the Cool Central Desertic Basins and Plateaus 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: • Severe Ground Disturbance and/or Heavy Continuous Season-Long Grazing will convert this plant community to the Cheatgrass State.

Table 5. Annual production by plant type

Plant Type	Low (Kg/Hectare)	Representative Value (Kg/Hectare)	High (Kg/Hectare)
Grass/Grasslike	235	353	510
Shrub/Vine	50	76	110
Forb	50	75	109
Total	335	504	729

**Figure 5. Plant community growth curve (percent production by month).
WY0301, 34AC, Upland Sites. All Upland Sites.**

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
			5	40	50			5			

**State 2
Cheatgrass**

**Community 2.1
Cheatgrass**

This plant community is a result of frequent and severe grazing followed by severe ground disturbance. Green rabbitbrush, fringed sagewort, cheatgrass, and annual forbs are significant components of this plant community. The total annual production (air-dry weight) of this state is about 150 pounds per acre, but it can range from about 50 lbs./acre in unfavorable years to about 350 lbs./acre in above average years. The state is unstable and vulnerable to excessive erosion, however rock fragment typically prevents serious erosion from occurring. The biotic integrity of this plant community is at risk depending on how far a shift has occurred in plant composition toward cheatgrass and annual forbs. The watershed is usually at risk or nonfunctioning due to an increase in bare ground. Transitional pathways leading to other plant communities are as follows: It is not often practicable or economically feasible to convert this plant community at the present time.

**Figure 6. Plant community growth curve (percent production by month).
WY0301, 34AC, Upland Sites. All Upland Sites.**

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
			5	40	50			5			

Additional community tables

Table 6. Community 1.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production (Kg/Hectare)	Foliar Cover (%)
Grass/Grasslike					
1				101–151	
	bluebunch wheatgrass	PSSP6	<i>Pseudoroegneria spicata</i>	101–151	–
2				50–101	
	needle and thread	HECO26	<i>Hesperostipa comata</i>	50–101	–
3				50–101	
	Indian ricegrass	ACHY	<i>Achnatherum hymenoides</i>	50–101	–
4				26–50	
	western wheatgrass	PASM	<i>Pascopyrum smithii</i>	26–50	–
5				26–76	
	Grass, perennial	2GP	<i>Grass, perennial</i>	0–26	–
	Letterman's needlegrass	ACLE9	<i>Achnatherum lettermanii</i>	0–26	–
	needleleaf sedge	CADU6	<i>Carex duriuscula</i>	0–26	–
	plains reedgrass	CAMO	<i>Calamagrostis montanensis</i>	0–26	–
	squirreltail	ELEL5	<i>Elymus elymoides</i>	0–26	–
	prairie Junegrass	KOMA	<i>Koeleria macrantha</i>	0–26	–
	muttongrass	POFE	<i>Poa fendleriana</i>	0–26	–
	Sandberg bluegrass	POSE	<i>Poa secunda</i>	0–26	–
Forb					
6				26–76	
	Forb, perennial	2FP	<i>Forb, perennial</i>	0–26	–
	common yarrow	ACMI2	<i>Achillea millefolium</i>	0–26	–
	rosy pussytoes	ANRO2	<i>Antennaria rosea</i>	0–26	–
	sandwort	ARENA	<i>Arenaria</i>	0–26	–
	milkvetch	ASTRA	<i>Astragalus</i>	0–26	–
	castilla	CAST1	<i>Castilla</i>	0–26	–
	tapertip hawksbeard	CRAC2	<i>Crepis acuminata</i>	0–26	–
	fleabane	ERIGE2	<i>Erigeron</i>	0–26	–
	buckwheat	ERIOG	<i>Eriogonum</i>	0–26	–
	aster	EUCEP2	<i>Eucephalus</i>	0–26	–
	blue flax	LIPE2	<i>Linum perenne</i>	0–26	–
	granite prickly phlox	LIPU11	<i>Linanthus pungens</i>	0–26	–
	nailwort	PARON	<i>Paronychia</i>	0–26	–
	beardtongue	PENST	<i>Penstemon</i>	0–26	–
	phacelia	PHACE	<i>Phacelia</i>	0–26	–
	spiny phlox	PHHO	<i>Phlox hoodii</i>	0–26	–
	buttercup	RANUN	<i>Ranunculus</i>	0–26	–
	stonecrop	SEDUM	<i>Sedum</i>	0–26	–
	stemless mock goldenweed	STAC	<i>Stenotus acaulis</i>	0–26	–
	clover	TRIFO	<i>Trifolium</i>	0–26	–

	violet	VIOLA	<i>Viola</i>	0–26	–
Shrub/Vine					
7				26–76	
	little sagebrush	ARAR8	<i>Artemisia arbuscula</i>	0–26	–
	black sagebrush	ARNO4	<i>Artemisia nova</i>	0–26	–
	big sagebrush	ARTR2	<i>Artemisia tridentata</i>	0–26	–
	yellow rabbitbrush	CHVI8	<i>Chrysothamnus viscidiflorus</i>	0–26	–
	winterfat	KRLA2	<i>Krascheninnikovia lanata</i>	0–26	–

Animal community

Animal Community – Wildlife Interpretations

Bluebunch Wheatgrass Plant Community (HCPC): This plant community does not contribute much forage to wildlife nor is it typically inhabited by burrowing animals due to the high volume of coarse fragments in the profile. It is mostly used by wildlife in transit to other habitats. When found proximal to taller sagebrush, these sites are suitable locations for sage grouse leks. When occurring near perennial water, it may be used by killdeer for nesting.

Cheatgrass Plant Community: This plant community exhibits a low level of plant species diversity. In most cases, it is not a desirable plant community to select as a wildlife habitat management objective.

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)

Bluebunch Wheatgrass (HCPC) 300-650 lb./ac and .14 AUM/ac

Cheatgrass 50-350 lb./ac and .04 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 highly variable and is dominated by soils in hydrologic group B and C, with localized areas in hydrologic group D. Infiltration ranges from slow to very rapid. Runoff potential for this site varies from moderate to high depending on soil hydrologic group, slope 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 may be present, but should be small. Water flow patterns should be barely distinguishable. Pedestals are only slightly present in association with bunchgrasses such as bluebunch wheatgrass. Litter typically falls in place, and signs of movement are not common. Chemical and physical crusts are rare to non-existent. Cryptogammic 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 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.

Author(s)/participant(s)	K. Clause, E. Bainter
Contact for lead author	karen.clause@wy.usda.gov or 307-367-2257
Date	03/16/2007
Approved by	E. Bainter
Approval date	
Composition (Indicators 10 and 12) based on	Annual Production

Indicators

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

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

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3. **Number and height of erosional pedestals or terracettes:** Rare to nonexistent.
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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 25-50%.
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5. **Number of gullies and erosion associated with gullies:** Active gullies should not be present.
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6. **Extent of wind scoured, blowouts and/or depositional areas:** Minimal to nonexistent.
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7. **Amount of litter movement (describe size and distance expected to travel):** Herbaceous litter expected to move in moderate amounts. Large woody debris will show only slight movement down slope.
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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 2 (interspaces) to 5 (under plant canopy), but average values should be 2.5 or greater.
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9. **Soil surface structure and SOM content (include type of structure and A-horizon color and thickness):** Soil data is limited for this site. Described A-horizons vary from 2-11 inches (5-28 cm) with OM of .5 to 1%.
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10. **Effect of community phase composition (relative proportion of different functional groups) and spatial distribution on infiltration and runoff:** Plant community consists of 70-85% grasses, 15% forbs, and 0-15% shrubs. Minimal plant canopy (15-50%) and litter plus slow to moderately rapid infiltration rates result in slight to moderate runoff. Basal cover is typically less than 5% and does very little to effect runoff on this site. Surface rock fragments of 20-50% provide site stability from erosion, but decrease infiltration.
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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 exists, but large amounts of subsurface coarse fragments may be mistaken for a compaction layer.
-
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 forbs=perennial shrubs>cool season rhizomatous

grasses>short, cool season bunchgrasses>

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 5-25% of total canopy measurement with total litter (including beneath the plant canopy) from 15-50% expected. Herbaceous litter depth is typically shallow, ranging from 2-8mm. 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: 300-650 lb/ac (450 lb/ac average); Metric: 336-728 kg/ha (504 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:** Rabbitbrush, Sandberg bluegrass, and phlox are common increasers. Annual weeds such as cheatgrass, mustards, kochia, and Russian thistle are common invasive species in disturbed sites.
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17. **Perennial plant reproductive capability:** All species are capable of reproducing, except in drought years.
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