

Ecological site R034AY104WY Clayey Green River and Great Divide Basins (Cy)

Last updated: 9/28/2023
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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.

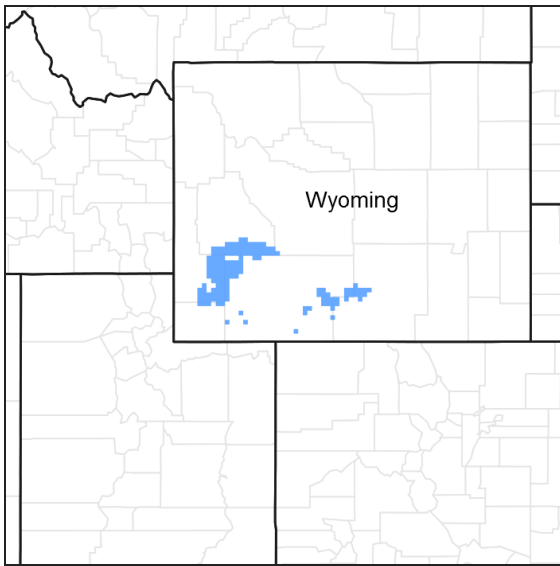


Figure 1. Mapped extent

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

R034AY122WY	Loamy Green River and Great Divide Basins (Ly) Loamy
R034AY150WY	Sandy Green River and Great Divide Basins (Sy) Sandy
R034AY158WY	Shallow Clayey Green River and Great Divide Basins (SwCy) Shallow Clayey

Similar sites

R034AY122WY	Loamy Green River and Great Divide Basins (Ly) Loamy (Ly) 7-9GR has coarser soil texture and more diverse grass species.
R034AY204WY	Clayey Foothills and Basins West (Cy) Clayey (Cy) 10-14W has higher production.

Table 1. Dominant plant species

Tree	Not specified
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Shrub	Not specified
Herbaceous	Not specified

Physiographic features

This site occurs in a lowland position on relatively flat to gently sloping topography. It is found on all exposures.

Table 2. Representative physiographic features

Landforms	(1) Alluvial fan (2) Hill (3) Stream terrace
Flooding frequency	None
Ponding frequency	None
Elevation	1,829–2,195 m
Slope	0–60%
Ponding depth	0 cm
Aspect	Aspect is not a significant factor

Climatic features

Annual precipitation ranges from 7-9 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 July 15. Some green up of cool season plants may occur in September if moisture is available.

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 “Bitter Creek”, “Farson”, “Rock Springs FAA AP”, and “Wamsutter” in Sweetwater County; “Church Buttes Gas PLT”, and Mountain View” in Uinta County; “Fontenelle”, “La Barge”, and “Sage 4 NNW” in Lincoln County; and “Big Piney” in Sublette County.

Table 3. Representative climatic features

Frost-free period (average)	121 days
Freeze-free period (average)	132 days
Precipitation total (average)	229 mm

Influencing water features

No water features are associated with this site.

Soil features

The soils of this site are moderately deep to very deep fine textured soils. Thin coarse-loamy surface layers are

common. They are at least 15 inches deep with textures ranging from silty clay through the finer silty and sandy clay loams. Soil cracking (not severe) occurs during the dry summer months, especially where the plant cover has been reduced. Root penetration is somewhat restricted due to the fine textures and reduced depth of moisture penetration. Water holding capacity is high, but the surface intake is restricted which causes runoff and reduced effectiveness of precipitation. Permeability is moderately slow to slow.

Major Soil Series correlate to this site include: The Shellcreek series

Other Soil Series correlated to this site in MLRA 34A include: Milren, Nayfan and some phases of the Sandbranch series.

Table 4. Representative soil features

Surface texture	(1) Sandy loam (2) Silty clay (3) Clay loam
Family particle size	(1) Clayey
Drainage class	Well drained
Permeability class	Moderately slow to slow
Soil depth	38–152 cm
Surface fragment cover <=3"	0%
Surface fragment cover >3"	0%
Available water capacity (0-101.6cm)	8.13–15.24 cm
Calcium carbonate equivalent (0-101.6cm)	0–10%
Electrical conductivity (0-101.6cm)	0–10 mmhos/cm
Sodium adsorption ratio (0-101.6cm)	0–5
Soil reaction (1:1 water) (0-101.6cm)	7.4–9
Subsurface fragment volume <=3" (Depth not specified)	0%
Subsurface fragment volume >3" (Depth not specified)	0%

Ecological dynamics

As this site deteriorates because of a combination of frequent and severe grazing, species such as big sagebrush and green rabbitbrush will increase. Indian ricegrass 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.

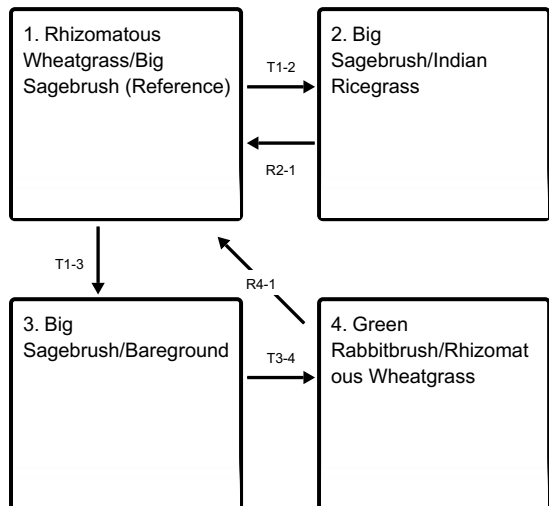
The Historic Climax Plant Community (description follows the plant community diagram) has been determined by study of rangeland relic areas, or areas protected from excessive disturbance. Trends in plant communities going from heavily grazed areas to lightly grazed areas, seasonal use pastures, and historical accounts have also been

used.

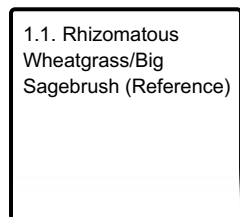
The following is a State and Transition Model Diagram that illustrates the common plant communities (states) that can occur on the site and the transitions between these communities. The ecological processes will be discussed in more detail in the plant community narratives following the diagram.

State and transition model

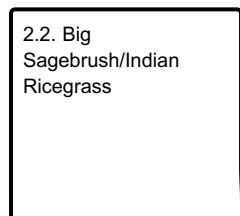
Ecosystem states



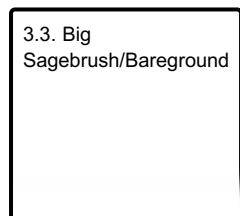
State 1 submodel, plant communities



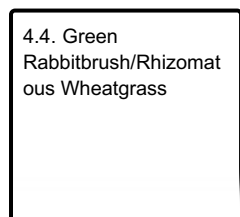
State 2 submodel, plant communities



State 3 submodel, plant communities



State 4 submodel, plant communities



State 1

Rhizomatous Wheatgrass/Big Sagebrush (Reference)

Community 1.1

Rhizomatous Wheatgrass/Big Sagebrush (Reference)

The interpretive plant community for this site is the Reference Plant Community. This state evolved with grazing by large herbivores and is suited for grazing by domestic livestock. Potential vegetation is estimated at 70% grasses or grass-like plants, 15% forbs and 15% woody plants. The major grasses include rhizomatous wheatgrass, bottlebrush squirreltail, and Indian ricegrass. Other grasses and grass-like plants may include prairie junegrass, plains reedgrass, needleleaf sedge, and Sandberg bluegrass. Wyoming big sagebrush is the major woody plant. Other woody plants that may occur include early, low, and bud sagebrush, green rabbitbrush, Gardner's saltbush, shadscale, winterfat, and spineless horsebrush. A typical plant composition for this state consists of rhizomatous wheatgrass 25-45%, Indian ricegrass 10-20%, bottlebrush squirreltail 10-20%, other grasses and grass-like plants 5-15%, perennial forbs 5-15%, Wyoming big sagebrush 5-15%, and 5-10% other woody species. Ground cover, by ocular estimate, varies from 40-50%. The total annual production (air-dry weight) of this state is about 450 pounds per acre, but it can range from about 250 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 allow 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: • Nonuse will convert this plant community to the Heavy Big Sage/Indian Ricegrass State. • Heavy Continuous Season-long Grazing will convert this plant community to the Big Sage/Bare Ground State.

Table 5. Annual production by plant type

Plant Type	Low (Kg/Hectare)	Representative Value (Kg/Hectare)	High (Kg/Hectare)
Grass/Grasslike	196	353	510
Forb	41	75	110
Shrub/Vine	43	76	109
Total	280	504	729

Figure 5. Plant community growth curve (percent production by month).
WY0401, 7-9GR, UPLAND SITES. ALL UPLAND SITES.

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0	0	0	10	35	40	10	0	5	0	0	0

State 2

Big Sagebrush/Indian Ricegrass

Community 2.1

Big Sagebrush/Indian Ricegrass

This plant community is the result of protection from grazing. Wyoming big sagebrush dominates with annual production often exceeding 25%, and herbaceous forage production is decreased. The understory of grass includes rhizomatous wheatgrass, Indian ricegrass, bottlebrush squirreltail, Sandberg bluegrass, and prairie junegrass. The total annual production (air-dry weight) of this state is about 350 pounds per acre, but it can range from about 150 lbs./acre in unfavorable years to about 550 lbs./acre in above average years. The state is stable and protected from excessive erosion. The biotic integrity of this plant community is usually intact, however forage value will decrease and wildlife values will shift toward different species. The watershed is functioning. Transitional pathways leading to other plant communities are as follows: • Chemical Brush Management followed by deferment for 1 to 2 years as part of a Prescribed Grazing plan will return this state to near Historic Climax Plant Community (Rhizomatous Wheatgrass/Big Sage State). Care should be taken when planning brush management activities to consider wildlife habitat and critical winter ranges.

Figure 6. Plant community growth curve (percent production by month).
WY0401, 7-9GR, UPLAND SITES. ALL UPLAND SITES.

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0	0	0	10	35	40	10	0	5	0	0	0

State 3
Big Sagebrush/Bareground

Community 3.1
Big Sagebrush/Bareground

This plant community is the result of improper grazing. Wyoming big sagebrush dominates with annual production often exceeding 30%. There is mostly bare ground between sagebrush plants with an understory of grass and forbs limited to the protected areas under shrubs. The major grasses include Sandberg bluegrass and rhizomatous wheatgrass. 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. Soil erosion is accelerated because of increased bare ground. The biotic community has been compromised, but is relatively stable. The watershed is functioning, but is at risk of further degradation. Water flow patterns and pedestals are obvious. Infiltration is reduced and runoff is increased. Transitional pathways leading to other plant communities are as follows: • Chemical Brush Management followed by Continuous Season-long Grazing will convert this plant community to the Green Rabbitbrush/Rhizomatous Wheatgrass State.

Figure 7. Plant community growth curve (percent production by month).
WY0401, 7-9GR, UPLAND SITES. ALL UPLAND SITES.

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0	0	0	10	35	40	10	0	5	0	0	0

State 4
Green Rabbitbrush/Rhizomatous Wheatgrass

Community 4.1
Green Rabbitbrush/Rhizomatous Wheatgrass

This plant community is the result of brush management followed by improper grazing techniques. Rhizomatous wheatgrass and bottlebrush squirreltail are the dominant grasses. With sagebrush removed, green rabbitbrush will be the dominant shrub, often exceeding 10-20% of the annual production. Rhizomatous wheatgrasses, low growing bunchgrasses such as Sandberg bluegrass, and unpalatable annual and perennial forbs dominate the herbaceous understory. There is a substantial amount of bare ground. The total annual production (air-dry weight) of this state is about 100 pounds per acre, but it can range from about 50 lbs./acre in unfavorable years to about 300 lbs./acre in above average years. The soil is not protected and erosion will increase if management is not changed. The biotic integrity may be reduced due to low vegetative production. The watershed is functioning at risk. Transitional pathways leading to other plant communities are as follows: • Chemical Brush Management and Re-seeding followed by 1 to 2 years deferment as part of a Prescribed Grazing plan will return this plant community to near Historic Climax Plant Community (Rhizomatous Wheatgrass/Big Sage State). Additional deferment may be necessary and should be prescribed on an individual site basis. Care should be taken when planning brush management to consider wildlife habitat and critical winter ranges.

Figure 8. Plant community growth curve (percent production by month).
WY0401, 7-9GR, UPLAND SITES. ALL UPLAND SITES.

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0	0	0	10	35	40	10	0	5	0	0	0

Transition T1-2
State 1 to 2

Nonuse will convert this plant community to the Heavy Big Sage/Indian Ricegrass State.

Transition T1-3

State 1 to 3

Heavy Continuous Season-long Grazing will convert this plant community to the Big Sage/*Bare Ground* State.

Restoration pathway R2-1

State 2 to 1

Chemical Brush Management followed by deferment for 1 to 2 years as part of a Prescribed Grazing plan will return this state to near Reference Plant Community (Rhizomatous Wheatgrass/Big Sage State). Care should be taken when planning brush management activities to consider wildlife habitat and critical winter ranges.

Transition T3-4

State 3 to 4

Chemical Brush Management followed by Continuous Season-long Grazing will convert this plant community to the Green Rabbitbrush/Rhizomatous Wheatgrass State.

Restoration pathway R4-1

State 4 to 1

Chemical Brush Management and Re-seeding followed by 1 to 2 years deferment as part of a Prescribed Grazing plan will return this plant community to near Reference Plant Community (Rhizomatous Wheatgrass/Big Sage State). Additional deferment may be necessary and should be prescribed on an individual site basis. Care should be taken when planning brush management to consider wildlife habitat and critical winter ranges.

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				127–228	
	western wheatgrass	PASM	<i>Pascopyrum smithii</i>	127–228	–
2				50–101	
	squirreltail	ELEL5	<i>Elymus elymoides</i>	50–101	–
3				50–101	
	Indian ricegrass	ACHY	<i>Achnatherum hymenoides</i>	50–101	–
4				26–76	
	Grass, perennial	2GP	<i>Grass, perennial</i>	0–26	–
	needleleaf sedge	CADU6	<i>Carex duriuscula</i>	0–26	–
	plains reedgrass	CAMO	<i>Calamagrostis montanensis</i>	0–26	–
	needle and thread	HECO26	<i>Hesperostipa comata</i>	0–26	–
	prairie Junegrass	KOMA	<i>Koeleria macrantha</i>	0–26	–
	Sandberg bluegrass	POSE	<i>Poa secunda</i>	0–26	–
Forb					
5				26–76	
	Forb, perennial	2FP	<i>Forb, perennial</i>	0–26	–
	yarrow	ACHIL	<i>Achillea</i>	0–26	–
	textile onion	ALTE	<i>Allium textile</i>	0–26	–
	rosv pussvtoes	ANRO2	<i>Antennaria rosea</i>	0–26	–

	milkvetch	ASTRA	<i>Astragalus</i>	0–26	–
	Indian paintbrush	CASTI2	<i>Castilleja</i>	0–26	–
	tapertip hawksbeard	CRAC2	<i>Crepis acuminata</i>	0–26	–
	buckwheat	ERIOG	<i>Eriogonum</i>	0–26	–
	aster	EUCEP2	<i>Eucephalus</i>	0–26	–
	sneezeweed	HELEN	<i>Helenium</i>	0–26	–
	desertparsley	LOMAT	<i>Lomatium</i>	0–26	–
	tufted evening primrose	OECA10	<i>Oenothera caespitosa</i>	0–26	–
	phlox	PHLOX	<i>Phlox</i>	0–26	–
	stonecrop	SEDUM	<i>Sedum</i>	0–26	–
	scarlet globemallow	SPCO	<i>Sphaeralcea coccinea</i>	0–26	–
	clover	TRIFO	<i>Trifolium</i>	0–26	–
	deathcamas	ZIGAD	<i>Zigadenus</i>	0–26	–
Shrub/Vine					
6				26–76	
	big sagebrush	ARTR2	<i>Artemisia tridentata</i>	26–76	–
7				26–50	
	little sagebrush	ARAR8	<i>Artemisia arbuscula</i>	0–26	–
	little sagebrush	ARARL	<i>Artemisia arbuscula</i> ssp. <i>longiloba</i>	0–26	–
	birdfoot sagebrush	ARPE6	<i>Artemisia pedatifida</i>	0–26	–
	shadscale saltbush	ATCO	<i>Atriplex confertifolia</i>	0–26	–
	Gardner's saltbush	ATGA	<i>Atriplex gardneri</i>	0–26	–
	yellow rabbitbrush	CHVI8	<i>Chrysothamnus viscidiflorus</i>	0–26	–
	winterfat	KRLA2	<i>Krascheninnikovia lanata</i>	0–26	–
	bud sagebrush	PIDE4	<i>Picrothamnus desertorum</i>	0–26	–
	spineless horsebrush	TECA2	<i>Tetradymia canescens</i>	0–26	–

Animal community

Animal Community – Wildlife Interpretations

Rhizomatous Wheatgrass/Big Sagebrush Plant Community (HCPC): Suitable thermal and escape cover for mule deer may be limited due to the low height and density of woody plants. However, 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. Open spaces in the sagebrush canopy are potential sage grouse lek locations. Other birds that would frequent this plant community include horned larks and golden eagles.

Big Sagebrush/Indian Ricegrass Plant Community: This plant community may be useful for the same wildlife that would use the Historic Climax Plant Community.

Big Sagebrush/Bareground Plant Community: This plant community may be beneficial for the same wildlife that would use the Historic Climax Plant Community. However, the plant community composition is less diverse, and thus, less apt to meet the seasonal needs of these animals.

Green Rabbitbrush/Rhizomatous Wheatgrass Plant Community: These communities provide limited forage for

antelope and mule deer due to low production and lack of sagebrush. They may be used as a foraging site by sage grouse if proximal to woody cover.

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)

Rhizomatous Wheatgrass/Big Sagebrush Plant Community (HCPC) 250-650 lb./ac and 0.12 AUM/ac

Big Sagebrush/Indian Ricegrass Plant Community 150-550 lb./ac and 0.07 AUM/ac

Big Sagebrush/Bareground Plant Community 50-350 lb./ac and 0.05 AUM/ac

Green Rabbitbrush/Rhizomatous Wheatgrass Plant Community 50-300 lb./ac and 0.03 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 C, with localized areas in hydrologic group D. Infiltration ranges from very slow to moderately slow. Runoff potential for this site varies from moderate to high depending on soil hydrologic group and ground cover. In many cases, lesser sloping areas with greater than 75% ground cover have the greatest potential for high infiltration and lower runoff. Greater sloping 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 hydrologic 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 and shrubs. 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 aesthetic values that appeal 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

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Approval

Kirt Walstad, 9/28/2023

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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Date	03/16/2007
Approved by	Kirt Walstad
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.
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2. **Presence of water flow patterns:** Barely 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 20-50%.
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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.
-
7. **Amount of litter movement (describe size and distance expected to travel):** Herbaceous litter expected to move only in small amounts (to leeward side of shrubs) due to wind. Large woody debris from sagebrush will show no movement.
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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 3 (interspaces) to 6 (under plant canopy), but average values should be 3.5 or greater.
-
9. **Soil surface structure and SOM content (include type of structure and A-horizon color and thickness):** Typically an A-horizon of greater than 3 inches (7 cm) with medium platy structure, color hues of 10YR or 5Y, values 5-7, and chromas 2-4 with OM of less than 1%.
-
10. **Effect of community phase composition (relative proportion of different functional groups) and spatial distribution on infiltration and runoff:** Plant community consists of 60-70% grasses, 15% forbs, and 15-25% shrubs. Unevenly distributed plant canopy (30-60%) and litter plus slow infiltration rates result in slight to moderate runoff. Basal cover typically is 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):** No compaction layer exists, but some soil crusting in dry conditions is typical.
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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: cool season rhizomatous grasses> mid-size, cool season bunchgrasses>perennial shrubs>perennial forbs>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.
-
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 10-40% expected. Herbaceous litter depth is typically very shallow, ranging from 1-5mm. Woody litter can be up to a couple inches (4-6cm).

15. **Expected annual annual-production (this is TOTAL above-ground annual-production, not just forage annual-production):** English: 250-650 lb/ac (450 lb/ac average); Metric: 280-728 kg/ha (504 kg/ha average).

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. Green rabbitbrush, Sandberg bluegrass, and phlox are common increasers. Annual weeds such as halogeton, kochia, and Russian thistle are common invasive species in disturbed sites.

17. **Perennial plant reproductive capability:** All species are capable of reproducing, except in drought years.
