USDA Natural Resources
Conservation Service

Ecological site R034AY128WY
Lowland Green River and Great Divide Basins (LL)

Last updated: 2/24/2025
Accessed: 05/12/2025

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.

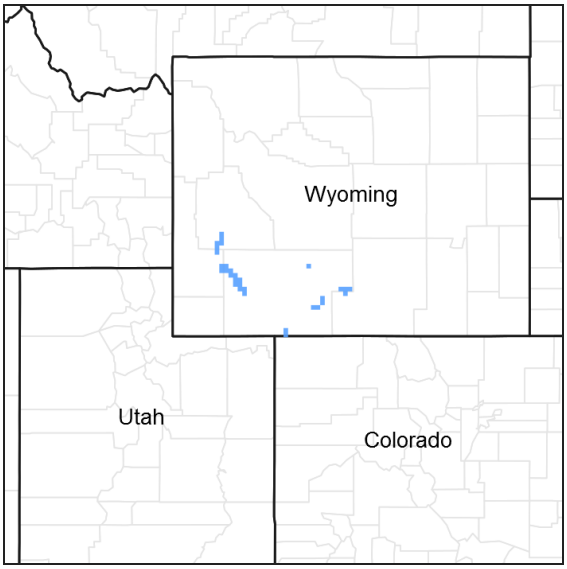


Figure 1. Mapped extent

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

R034AY174WY	**Subirrigated Green River and Great Divide Basins (Sb)** Subirrigated
R034AY178WY	**Wetland Green River and Great Divide Basins (WL)** Wetland

Similar sites

R034AY174WY	**Subirrigated Green River and Great Divide Basins (Sb)** Subirrigated (Sb) 7-9GR has a higher water table and the absence of cottonwood.
R034AY228WY	**Lowland Foothills and Basins West (LL)** Lowland (LL) 10-14W has higher production.

Table 1. Dominant plant species

Tree	Not specified
Shrub	Not specified
Herbaceous	Not specified

Physiographic features

This site occurs on gently sloping land along perennial or intermittent streams. It is found on all exposures. Slopes vary from 0 to 10%, but are mostly 0 to 3%.

Table 2. Representative physiographic features

Landforms	(1) Alluvial fan (2) Drainageway (3) Stream terrace
Flooding frequency	None
Elevation	6,000–7,200 ft
Slope	0–10%
Ponding depth	0 in
Water table depth	36 in
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)	9 in

Influencing water features

There are no water features associated with this site.

Soil features

The soils of this site are deep to very deep, stratified in texture, and most commonly occur on stream terraces. The depth to a seasonal high water table is 3 feet or greater and is beneficial to the woody plants but not to the majority of the forbs or grasses. These soils may occasionally receive overflow water.

Major Soil Series correlated to this site include: Clowers, Quealman, and a phase of the Otterson series.

Table 4. Representative soil features

Surface texture	(1) Loam (2) Fine sandy loam (3) Loamy sand
Family particle size	(1) Loamy
Drainage class	Moderately well drained to well drained
Permeability class	Moderate to moderately rapid
Soil depth	15–60 in
Surface fragment cover <=3"	0%
Surface fragment cover >3"	0%
Available water capacity (0-40in)	4–5 in
Calcium carbonate equivalent (0-40in)	0–10%
Electrical conductivity (0-40in)	0–8 mmhos/cm
Sodium adsorption ratio (0-40in)	0–5
Soil reaction (1:1 water) (0-40in)	7.9–8.4
Subsurface fragment volume <=3" (Depth not specified)	0–20%
Subsurface fragment volume >3" (Depth not specified)	0–5%

Ecological dynamics

As this site deteriorates from improper grazing management, species such as big sagebrush and rubber rabbitbrush will increase, and species such as thistles and Kentucky bluegrass invade the site. Grasses such as basin wildrye and needleandthread will decrease in frequency and production. Cottonwood will lose younger age classes.

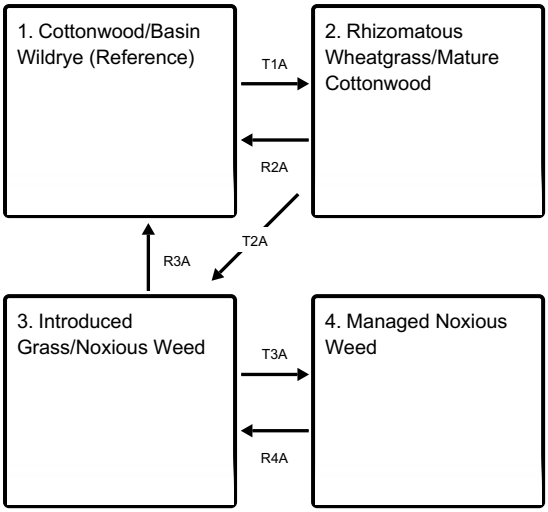
These plant communities narratives may not represent every possibility, but they probably are the most prevalent and repeatable plant communities. The plant composition tables shown above have been developed from the best available knowledge at the time of this revision. As more data is collected, some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

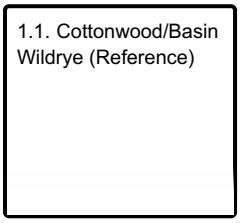
The following is a State and Transition Model Diagram that illustrates the common plant communities (states) that can occur on the site and the transitions between these communities. The ecological processes will be discussed in more detail in the plant community narratives following the diagram.

State and transition model

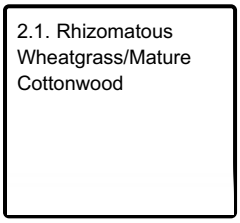
Ecosystem states



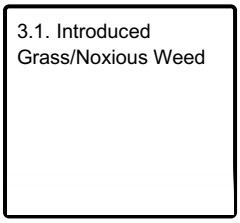
State 1 submodel, plant communities



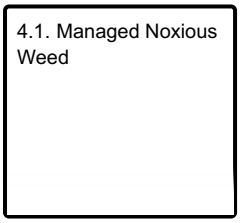
State 2 submodel, plant communities



State 3 submodel, plant communities



State 4 submodel, plant communities



State 1
Cottonwood/Basin Wildrye (Reference)

Community 1.1
Cottonwood/Basin Wildrye (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 45% grasses or grass-like plants, 15% forbs and 40% woody plants. The major grasses include needleandthread, basin wildrye,

Letterman needlegrass, thickspike wheatgrass, and bottlebrush squirreltail. Other grasses and grass-like plants may include Canada wildrye, Indian ricegrass, prairie junegrass, bluebunch wheatgrass, Canby bluegrass, needleleaf sedge, and Sandberg bluegrass. The major woody plants include cottonwood and buffaloberry. Other woody plants that may occur include currant, wild rose, rubber rabbitbrush, silver sagebrush, willows, big sagebrush, and skunkbush sumac. A typical plant composition for this state consists of needleandthread 15-30%, Basin wildrye 10-25%, Letterman needlegrass 10-20%, thickspike wheatgrass 10-20%, Bottlebrush squirreltail 5-10%, other grasses and grass-like plants 5-15%, perennial forbs 5-15%, cottonwood 5-20%, up to 10% buffaloberry, and 5-10% other woody species. Ground cover, by ocular estimate, varies from 65-70%. The total annual production (air-dry weight) of this state is about 2000 pounds per acre, but it can range from about 1400 lbs./acre in unfavorable years to about 2700 lbs./acre in above average years. This state is stable and well adapted to the Cool Central Desertic Basins and Plateaus climatic conditions. The diversity in plant species and seasonal water table 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: • Continuous Season-long Grazing will convert this plant community to the Rhizomatous Wheatgrass/Mature Cottonwood State.

Table 5. Annual production by plant type

Plant Type	Low (Lb/Acre)	Representative Value (Lb/Acre)	High (Lb/Acre)
Grass/Grasslike	630	900	1215
Shrub/Vine	280	400	540
Tree	280	400	540
Forb	210	300	405
Total	**1400**	**2000**	**2700**

Figure 5. Plant community growth curve (percent production by month). WY0402, 7-9 GR, Extra Water Sites - LL, SL. LL, SL, Extra Water Sites.

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0	0	0	10	25	35	25	5	0	0	0	0

State 2
Rhizomatous Wheatgrass/Mature Cottonwood

Community 2.1
Rhizomatous Wheatgrass/Mature Cottonwood

This plant community evolved under heavy grazing by domestic livestock. Dominant grasses include rhizomatous wheatgrass, Kentucky bluegrass, and other introduced grasses. Woody plants resistant to grazing such as wild rose and silverberry increase. Cottonwoods become mature and decadent without younger age classes present. As the site dries, woody species such as rubber rabbitbrush and big sagebrush increase. This state is extremely vulnerable to the invasion of noxious weeds. The total annual production (air-dry weight) of this state is about 1500 pounds per acre, but it can range from about 900 lbs./acre in unfavorable years to about 2200 lbs./acre in above average years. The soil of this state is not well protected. The biotic integrity is somewhat compromised by more xeric species, decreased plant diversity, and increased bare ground. The watershed is somewhat functioning, but may produce excessive runoff. Transitional pathways leading to other plant communities are as follows: • Prescribed Grazing will result in a plant community very similar to the Reference Plant Community (Cottonwood/Basin Wildrye State).

Figure 6. Plant community growth curve (percent production by month). WY0402, 7-9 GR, Extra Water Sites - LL, SL. LL, SL, Extra Water Sites.

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0	0	0	10	25	35	25	5	0	0	0	0

State 3
Introduced Grass/Noxious Weed

Community 3.1
Introduced Grass/Noxious Weed

This plant community is the result of long-term improper grazing use. This state is dominated by rhizomatous wheatgrass, Kentucky bluegrass, other introduced grasses, and noxious weeds. Woody species are greatly diminished if not totally absent. The total annual production (air-dry weight) of this state is about 500 pounds per acre, but it can range from about 200 lbs./acre in unfavorable years to about 1200 lbs./acre in above average years. Bare ground has increased. The soil of this state is not well protected. The watershed is nonfunctioning and usually produces excessive runoff. The biotic community is nonfunctioning due to invasive plants. Transitional pathways leading to other plant communities are as follows: • Prescribed Grazing and Noxious Weed Control will convert this plant community to the Managed Noxious Weed State. • Chemical Seedbed Preparation and Re-seeding followed by Nonuse for two or more years may return this state to near Reference Plant Community (Cottonwood/Basin Wildrye State). However, noxious weeds will persist to some degree.

Figure 7. Plant community growth curve (percent production by month). WY0402, 7-9 GR, Extra Water Sites - LL, SL. LL, SL, Extra Water Sites.

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0	0	0	10	25	35	25	5	0	0	0	0

State 4
Managed Noxious Weed

Community 4.1
Managed Noxious Weed

This plant community is the result of noxious weed control and prescribed grazing. Grazing is used as a tool to control introduced and noxious weeds by selecting livestock type and timing use during the flowering of the identified weed. Other weed control efforts such as chemical, mechanical, or biological methods are employed in conjunction with a grazing management scheme. The native plant community responds to this management by increasing in production and vigor, however it is very sensitive to any management change that allows the seed production and increase of noxious weeds such as nonuse or overuse. Noxious weeds are still present, but in smaller amounts. This state is dominated by rhizomatous wheatgrass, Kentucky bluegrass, other introduced grasses, cottonwood, silverberry, currants, and wild rose. Cottonwood is rejuvenating with young shoots present in the understory of mature trees, but a middle age class is conspicuously absent. The total annual production (air-dry weight) of this state is about 1800 pounds per acre, but it can range from about 1100 lbs./acre in unfavorable years to about 2500 lbs./acre in above average years. Bare ground has decreased. The soil of this state is moderately protected. The biotic community has been compromised, but is relatively stable and at risk due to invasive plants. The watershed is functioning, but is at risk of degrading rapidly with the introduction of improper management techniques. Transitional pathways leading to other plant communities are as follows: • Heavy Continuous Season-long Grazing will convert this plant community to the Introduced Grass/Noxious Weed State.

Figure 8. Plant community growth curve (percent production by month). WY0402, 7-9 GR, Extra Water Sites - LL, SL. LL, SL, Extra Water Sites.

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0	0	0	10	25	35	25	5	0	0	0	0

Transition T1A
State 1 to 2

Continuous Season-long Grazing will convert this plant community to the Rhizomatous Wheatgrass/Mature Cottonwood State.

Restoration pathway R2A
State 2 to 1

Prescribed Grazing will result in a plant community very similar to the Reference Plant Community

(Cottonwood/Basin Wildrye State).

Transition T2A
State 2 to 3

Heavy continuous season long grazing along with noxious weed invasion will convert this plant community to the Introduced Grass/Noxious Weed State.

Restoration pathway R3A
State 3 to 1

Chemical Seedbed Preparation and Re-seeding followed by Nonuse for two or more years may return this state to near Reference Plant Community (Cottonwood/Basin Wildrye State). However, noxious weeds will persist to some degree.

Transition T3A
State 3 to 4

Prescribed Grazing and Noxious Weed Control will convert this plant community to the Managed Noxious Weed State.

Restoration pathway R4A
State 4 to 3

Heavy Continuous Season-long Grazing will convert this plant community to the Introduced Grass/Noxious Weed State.

Additional community tables

Table 6. Community 1.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production (Lb/Acre)	Foliar Cover (%)
Grass/Grasslike					
1				300–600	
	needle and thread	HECO26	*Hesperostipa comata*	300–600	–
2				200–500	
	basin wildrye	LECI4	*Leymus cinereus*	200–500	–
3				200–400	
	thickspike wheatgrass	ELLAL	*Elymus lanceolatus ssp. lanceolatus*	200–400	–
4				200–400	
	Letterman's needlegrass	ACLE9	*Achnatherum lettermanii*	200–400	–
5				100–200	
	squirreltail	ELEL5	*Elymus elymoides*	100–200	–
6				100–300	
	Grass, perennial	2GP	*Grass, perennial*	0–100	–
	Indian ricegrass	ACHY	*Achnatherum hymenoides*	0–100	–
	needleleaf sedge	CADU6	*Carex duriuscula*	0–100	–
	Canada wildrye	ELCA4	*Elymus canadensis*	0–100	–
	prairie Junegrass	KOMA	*Koeleria macrantha*	0–100	–
	Sandberg bluegrass	POSE	*Poa secunda*	0–100	–

	bluebunch wheatgrass	PSSP6	*Pseudoroegneria spicata*	0–100	–
Forb					
7				100–300	
	Forb, perennial	2FP	*Forb, perennial*	0–100	–
	common yarrow	ACMI2	*Achillea millefolium*	0–100	–
	rosy pussytoes	ANRO2	*Antennaria rosea*	0–100	–
	fleabane	ERIGE2	*Erigeron*	0–100	–
	buckwheat	ERIOG	*Eriogonum*	0–100	–
	aster	EUCEP2	*Eucephalus*	0–100	–
	American licorice	GLLE3	*Glycyrrhiza lepidota*	0–100	–
	beardtongue	PENST	*Penstemon*	0–100	–
	spiny phlox	PHHO	*Phlox hoodii*	0–100	–
	slimflower scurfpea	PSTE5	*Psoralidium tenuiflorum*	0–100	–
	scarlet globemallow	SPCO	*Sphaeralcea coccinea*	0–100	–
	goldenbanner	THERM	*Thermopsis*	0–100	–
	clover	TRIFO	*Trifolium*	0–100	–
	violet	VIOLA	*Viola*	0–100	–
Tree					
8				100–400	
	narrowleaf cottonwood	POAN3	*Populus angustifolia*	100–400	–
	narrowleaf cottonwood	POAN3	*Populus angustifolia*	100–400	–
9				20–200	
	silver buffaloberry	SHAR	*Shepherdia argentea*	20–200	–
Shrub/Vine					
10				100–200	
	silver sagebrush	ARCA13	*Artemisia cana*	0–100	–
	big sagebrush	ARTR2	*Artemisia tridentata*	0–100	–
	rubber rabbitbrush	ERNA10	*Ericameria nauseosa*	0–100	–
	skunkbush sumac	RHTR	*Rhus trilobata*	0–100	–
	currant	RIBES	*Ribes*	0–100	–
	Woods' rose	ROWOW	*Rosa woodsii var. woodsii*	0–100	–
	willow	SALIX	*Salix*	0–100	–

Animal community

Animal Community – Wildlife Interpretations
Cottonwood/Basin Wildrye Plant Community (HCPC): The high degree of plant species and structural diversity, proximity to areas with water at or near the soil surface, and woody plants in this community favors a large variety of wildlife. Trees and shrubs provide suitable thermal and escape cover for mule deer, moose, and occasional whitetail deer as well as nesting habitat for all primary and secondary tree-nesting birds. This community provides habitat for a wide array of small mammals such as jackrabbits, cottontail rabbits, mice, and voles so diverse prey populations are available for badgers, fox, coyotes, and raptors such as red-tail and Swainson’s hawks. Birds such as western kingbird, western meadowlark, lark bunting, and grasshopper sparrow will utilize this community for nesting and foraging. The overstory of large cottonwoods provides habitat for a variety of birds ranging from golden eagles to neotropical migrants.

Managed Noxious Weed Plant Community: This plant community may be useful for the same large grazers 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

Rhizomatous Wheatgrass/Mature Cottonwood Plant Community: This plant community may be beneficial for some of the same wildlife that would use the Historic Climax Plant Community. However, the woody component is typically less productive and unable to support large browsers such as moose. As woody plants decrease, structural diversity is lost for neotropical migrants, cover decreased for deer, and nesting for tree-nesting birds is impacted.

Introduced Grass/Noxious Weed Plant Community: This plant community is less diverse, and thus, less able to meet the habitat needs of many wildlife species. Herbaceous forage and cover is not as dense and will aid in successful predation of nesting birds, therefore improving habitat for predators such as raptors, red fox, and coyote. It may provide some brood rearing and foraging opportunities for sage grouse when it occurs proximal to shrub 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)

Basin Wildrye/Cottonwood (HCPC) 1400-2700 lb./ac and .4 AUM/ac

Rhizomatous Wheatgrass/Mature Cottonwood 900-2200 lb./ac and .33 AUM/ac

Introduced Grass/Noxious Weed 200-1200 lb./ac and .17 AUM/ac

Managed Noxious Weed 1100-2500 lb./ac and .35 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 herbaceous forage production on this site. This site is dominated by soils in hydrologic groups B and C, with localized areas in hydrologic group D. Infiltration ranges from moderate to rapid. Runoff potential for this site varies from moderate to 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. 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.

Recreational uses

This site provides a variety of hunting opportunities as well providing popular camping areas for recreationists. This site has a wide variety of forbs which bloom throughout spring and summer, providing esthetic values that appeal to visitors.

Wood products

Limited value for firewood.

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

Approval

Kirt Walstad, 2/24/2025

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.

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2. **Presence of water flow patterns:** Water flow patterns sometimes evident in floodplain zone where this site occurs.

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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 0-30%.

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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 water flow patterns.

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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 6 (under plant canopy), but average values should be 4.0 or greater.

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9. **Soil surface structure and SOM content (include type of structure and A-horizon color and thickness):** Typically an A-horizon of variable depths with weak granular structure and color hues of 10YR or 2.5Y, values of 4-5, and chromas of 2-3. Soil OM is typically less than .8%.

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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 45-75% grasses, 15% forbs, and 10-40% shrubs/trees. Dense plant canopy (75-100%) and litter plus moderately rapid to rapid infiltration rates result in minimal to nonexistent runoff. Basal cover is typically greater than 5% for this site and does effectively reduce runoff on this site. Surface gravels are common on this site, which provide site stability, but reduce 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.

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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: mid-size, cool season bunchgrasses>trees>tall, cool season bunchgrasses>perennial shrubs=cool season rhizomatous grasses>perennial forbs

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13. **Amount of plant mortality and decadence (include which functional groups are expected to show mortality or decadence):** Some decadence evident, typically associated with shrub/tree component.

14. **Average percent litter cover (%) and depth (in):** Litter ranges from 10-30% of total canopy measurement with total litter (including beneath the plant canopy) from 70-95% expected. Herbaceous litter depth typically ranges from 10-25 mm. Woody litter can be up to several inches (>8 cm).

15. **Expected annual annual-production (this is TOTAL above-ground annual-production, not just forage annual-production):** English: 1400-2700 lb/ac (2000 lb/ac average); Metric: 1568-3024 kg/ha (2240 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 50% or noxious weed invasion are the most common indicators of a threshold being crossed. Wyoming big sagebrush, rabbitbrush, American licorice, and woods rose are common increasers. Perennial pepperweed, Canada thistle, Russian knapweed, and Kentucky bluegrass are common invasive species.

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