

Ecological site R043BY330WY
Overflow (Ov)
15-19" Foothills and Mountains East Precipitation Zone

Accessed: 09/24/2026

General information

Provisional. A provisional ecological site description has undergone quality control and quality assurance review. It contains a working state and transition model and enough information to identify the ecological site.

Associated sites

R043BY322WY	Loamy (Ly) 15-19" Foothills and Mountains East Precipitation Zone
R043BY374WY	Subirrigated (Sb) 15-19" Foothills and Mountains East Precipitation Zone
R043BY378WY	Wetland (WL) 15-19" Foothills and Mountains East Precipitation Zone

Similar sites

R032XY330WY	Overflow (Ov) 10-14" East Precipitation Zone Overflow 10-14" Foothills and Basins East P.Z. has lower production.
-------------	---

Table 1. Dominant plant species

Tree	Not specified
Shrub	Not specified
Herbaceous	Not specified

Physiographic features

This site occurs on areas that receive additional water from overflow of intermittent streams, snow depositional areas, or runoff from adjacent slopes.

Table 2. Representative physiographic features

Landforms	(1) Alluvial fan (2) Stream terrace
-----------	--

Flooding duration	Very brief (4 to 48 hours)
Flooding frequency	Frequent
Ponding frequency	None
Elevation	1,830 – 2,740 m
Slope	0 – 10 %
Ponding depth	0 cm
Aspect	Aspect is not a significant factor

Climatic features

Annual precipitation ranges from 15-19 inches per year. June is generally the wettest month. July, August, and September are somewhat less with daily amounts rarely exceeding one inch.

Snowfall is quite heavy in the area. Annual snowfall averages about 150 inches.

Because of the varied topography, the wind will vary considerably for different parts of the area. The wind is usually much lighter at the lower elevations and in the valleys as compared with the higher terrain. The average winter wind velocity is 8.5 mph while the summer wind velocity averages 7.5 mph. Winds during storms and on ridges may exceed 45 mph.

Growth of native cool-season plants begins about May 1 to May 15 and continues to about October 10.

The following information is from the "Crandall Creek" climate station, at the lower end of this precipitation zone:

Minimum Maximum 5 yrs. out of 10 between

Frost-free period (days): 16 80 July 8 – August 20

Freeze-free period (days): 37 120 June 17 – September 5

Mean Annual Precipitation (inches): 10.24 21.23

Mean annual precipitation: 14.90 inches

Mean annual air temperature: 38.16 F (21.88 F Avg. Min. to 54.66 F Avg. Max.)

For detailed information, visit the Natural Resources Conservation Service National Water and Climate Center at <http://www.wcc.nrcs.usda.gov/> website. There are no other climate station(s) known to be representative of this precipitation zone.

Table 3 Representative climatic features

Frost-free period (average)	80 days
Freeze-free period (average)	120 days
Precipitation total (average)	480 mm

Influencing water features

Stream type: None

Soil features

The soils of this site are deep (greater than 20"to bedrock), well drained and moderately permeable. Topsoil may vary from a sandy loam through light silty clay loams. Coarser or finer textured surface soils may also be present provided they are less than 2 to 4 inches thick. These areas receive additional water from overflow of intermittent streams or runoff from adjacent slopes. The soil characteristic having the most influence on the plant community is the additional available moisture.

Table 4. Representative soil features

Surface texture	(1) Loam (2) Silt loam (3) Fine sandy loam
Family particle size	(1) Loamy
Drainage class	Moderately well drained to excessively drained
Permeability class	Moderate to rapid
Soil depth	50 – 150 cm
Surface fragment cover <=3"	Not specified
Surface fragment cover >3"	Not specified
Available water capacity (0-101.6cm)	5.08 – 15.75 cm
Calcium carbonate equivalent (0-101.6cm)	0 – 10 %
Electrical conductivity (0-101.6cm)	0 – 10 mmhos/cm
Sodium adsorption ratio (0-101.6cm)	0 – 10
Soil reaction (1:1 water) (0-101.6cm)	6.6 – 8.4

Subsurface fragment volume <=3" (Depth not specified)	Not specified
Subsurface fragment volume >3" (Depth not specified)	Not specified

Ecological dynamics

Ecological Dynamics of the Site:

Potential vegetation on this site is dominated by tall and mid cool-season perennial grasses. Other significant vegetation includes serviceberry, chokecherry, and a variety of forbs. The expected potential composition for this site is about 75% grasses, 15% forbs and 10% woody plants. The composition and production will vary naturally due to historical use, fluctuating precipitation and fire frequency.

As this site deteriorates, species such as silver sagebrush, forbs and rhizomatous wheatgrasses increase. Cool season grasses such as basin wildrye and Columbia needlegrass will decrease in frequency and production. As conditions continue to deteriorate, annual forbs and grasses such as cheatgrass will invade.

Shrubs may become dominant on areas with an absence of fire and no use. Wildfires are actively controlled in recent times and as a result old decadent stands of woody species persist. Mechanical control has replaced the historic role of fire on this site. Recently, prescribed burning has regained some popularity.

Typically, many of these overflow sites have been significantly altered or modified, due to its productive features and proximity to water. Consequently, the original habitat for this site has been reduced or lost. On sites that have been cultivated and now remain fallow, the plant community is typically altered to such a degree that the vegetative structure and composition are lost. Reclaiming these sites to their native characteristics is not viable.

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

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

State and transition model

Additional community tables

Table 5. Community 1.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production ()	Foliar Cover (%)
Grass/Grasslike					
1				295-491	
	basin wildrye	LECI4	<i>Leymus cinereus</i>	295-491	–
2				196-392	
	slender wheatgrass	ELTR7	<i>Elymus trachycaulus</i>	196-392	–
3				99-295	
	Columbia needlegrass	ACNE9	<i>Achnatherum nelsonii</i>	99-295	–
4				0-196	
	mountain brome	BRMA4	<i>Bromus marginatus</i>	0-196	–
5				0-196	
	western wheatgrass	PASM	<i>Pascopyrum smithii</i>	0-196	–

6				0-196	
	Idaho fescue	FEID	<i>Festuca idahoensis</i>	0-196	–
7				0-196	
	Grass, perennial	2GP	<i>Grass, perennial</i>	0-99	–
	nodding brome	BRAN	<i>Bromus anomalus</i>	0-99	–
	timber oatgrass	DAIN	<i>Danthonia intermedia</i>	0-99	–
	squirreltail	ELEL5	<i>Elymus elymoides</i>	0-99	–
	prairie Junegrass	KOMA	<i>Koeleria macrantha</i>	0-99	–
	Sandberg bluegrass	POSE	<i>Poa secunda</i>	0-99	–
Forb					
8				99-295	
	Forb, perennial	2FP	<i>Forb, perennial</i>	0-99	–
	yarrow	ACHIL	<i>Achillea</i>	0-99	–
	agoseris	AGOSE	<i>Agoseris</i>	0-99	–
	rosy pussytoes	ANRO2	<i>Antennaria rosea</i>	0-99	–
	Indian paintbrush	CASTI2	<i>Castilleja</i>	0-99	–
	fleabane	ERIGE2	<i>Erigeron</i>	0-99	–
	buckwheat	ERIOG	<i>Eriogonum</i>	0-99	–
	aster	EUCEP2	<i>Eucephalus</i>	0-99	–
	Virginia strawberry	FRVI	<i>Fragaria virginiana</i>	0-99	–
	fragrant bedstraw	GATR3	<i>Galium triflorum</i>	0-99	–
	geranium	GERAN	<i>Geranium</i>	0-99	–
	American licorice	GLLE3	<i>Glycyrrhiza lepidota</i>	0-99	–
	stoneseed	LITHO3	<i>Lithospermum</i>	0-99	–
	lupine	LUPIN	<i>Lupinus</i>	0-99	–
	beardtongue	PENST	<i>Penstemon</i>	0-99	–
	phacelia	PHACE	<i>Phacelia</i>	0-99	–
	phlox	PHLOX	<i>Phlox</i>	0-99	–
	buttercup	RANUN	<i>Ranunculus</i>	0-99	–
	dock	RUMEX	<i>Rumex</i>	0-99	–
	stonecrop	SEDUM	<i>Sedum</i>	0-99	–
	goldenrod	SOLID	<i>Solidago</i>	0-99	–
	groundsel	TEPHR3	<i>Tephrosia</i>	0-99	–
Shrub/Vine					
9				99-196	
	Saskatoon serviceberry	AMAL2	<i>Amelanchier alnifolia</i>	99-196	–
10				99-196	
	chokecherry	PRVIV	<i>Prunus virginiana var. virginiana</i>	99-196	–
11				0-196	
	Shrub (>.5m)	2SHRUB	<i>Shrub (>.5m)</i>	0-99	–
	silver sagebrush	ARCA13	<i>Artemisia cana</i>	0-99	–
	water birch	BEOC2	<i>Betula occidentalis</i>	0-99	–
	snowbrush ceanothus	CEVE	<i>Ceanothus velutinus</i>	0-99	–
	currant	RIBES	<i>Ribes</i>	0-99	–
	Woods' rose	ROWOW	<i>Rosa woodsii var. woodsii</i>	0-99	–
	willow	SALIX	<i>Salix</i>	0-99	–

	silver buffaloberry	SHAR	Shepherdia argentea	0-99	–
	western snowberry	SYOC	Symphoricarpos occidentalis	0-99	–

Table 6. Community 2.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production ()	Foliar Cover (%)
-------	-------------	--------	-----------------	----------------------	------------------

Table 7. Community 3.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production ()	Foliar Cover (%)
-------	-------------	--------	-----------------	----------------------	------------------

Table 8. Community 4.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production ()	Foliar Cover (%)
-------	-------------	--------	-----------------	----------------------	------------------

Table 9. Community 5.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production ()	Foliar Cover (%)
-------	-------------	--------	-----------------	----------------------	------------------

Table 10. Community 6.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production ()	Foliar Cover (%)
-------	-------------	--------	-----------------	----------------------	------------------

Table 11. Community 7.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production ()	Foliar Cover (%)
-------	-------------	--------	-----------------	----------------------	------------------

Animal community

Animal Community – Wildlife Interpretations Basin Wildrye/Slender Wheatgrass Plant Community (HCPC): The predominance of grasses in this plant community favors grazers and mixed-feeders, such as deer, moose, bison, elk, and antelope. Suitable thermal and escape cover for these species may be limited due to the low quantities of woody plants. These sites are also important corridors within the foot slopes of mountains and between valuable water sources for many wildlife species. When found adjacent to sagebrush dominated states, this plant community may provide brood rearing/foraging areas for sage grouse, as well as lek sites. Other birds that would frequent this plant community include many nesting species, blue grouse, American kestrel, hawks, and golden eagle. If adjacent to water, the site may be frequented by bald Eagles, Wilson's phalarope, sandhill crane, great blue heron, waterfowl, and kingfishers. Many small mammals occur here and if adjacent to water, species such as muskrat, beaver and river otter may be present. Slender Wheatgrass/Idaho Fescue Plant Community: The combination of an overstory of shrubs and an understory of grasses and forbs provides a very diverse plant community for wildlife. The shrubs tend to break up hard crusted snow and many of these provide important sources of food for many wildlife species. Consequently, many large mammals use this state for foraging and cover year-round. These sites are also important corridors within the foot slopes of mountains and between upland sites and valuable water sources for many wildlife species. It provides important winter, nesting, brood-rearing, and foraging habitat for sage grouse. Other birds that would frequent this plant community include many nesting species, blue grouse, American kestrel, hawks, and golden eagles. If adjacent to water, the site may be frequented by bald Eagles, Wilson's phalarope, sandhill crane, great blue heron, waterfowl, and kingfishers. Many small mammals occur here and if adjacent to water, species such as muskrat, beaver and river otter may be present. Dense Shrub/Slender Wheatgrass Plant Community: The combination of an overstory of shrubs and an understory of grasses and forbs provides a very diverse plant community for wildlife. The shrubs tend to break up hard crusted snow and many species provide important sources of food for many wildlife species. Consequently, many large mammals use this state for foraging and cover year-round. These sites are also important corridors within the foot slopes of mountains and between upland sites and valuable water sources. It provides important winter, nesting, brood-rearing, and foraging habitat for sage grouse. Other birds that would frequent this plant community include many nesting species, blue grouse, American kestrel, hawks, and golden eagles. If adjacent to water, the site may be frequented by bald Eagles, Wilson's phalarope, sandhill crane, great blue heron, waterfowl, and kingfishers. Many small mammals occur here and if adjacent to water, species such as muskrat, beaver and river otter may be present. Rhizomatous Wheatgrass/Mixed Shrub Plant Community: The combination of an overstory of shrubs and an understory of grasses and forbs provides a very diverse plant community for wildlife. The shrubs tend to break up hard crusted snow and many of these provide important sources of food for many wildlife species. Consequently, many large mammals use this state for foraging and cover year-round. These sites are also important corridors within the foot slopes of mountains and between upland sites and valuable water sources. It provides important winter, nesting, brood-rearing, and foraging habitat for sage grouse. Other birds that would frequent this plant community include many nesting species, blue grouse, American kestrel, hawks, and golden eagle. If adjacent to water, the site may be frequented by bald Eagles, Wilson's phalarope, sandhill crane, great blue heron, waterfowl, and kingfishers. Many small mammals occur here and if adjacent to water, species such as muskrat, beaver and river otter may be present. Mixed Shrub/Bluegrass Plant Community: The increase in the overstory of shrubs provides for increase in year round cover and browsing selections for wildlife. The shrubs tend to break up hard crusted snow and many of these provide important sources of food for many wildlife species. However, due to the lack of herbaceous production and diversity of mid cool season grasses, this site is less beneficial to grazers. These sites are important corridors within the foot slopes of mountains and between upland sites and valuable water sources for many wildlife species. It provides important winter, nesting, brood-rearing, and foraging habitat for

sage grouse. Other birds that would frequent this plant community include many nesting species, blue grouse, American kestrel, hawks, and golden eagles. If adjacent to water, the site may be frequented by bald Eagles, Wilson's phalarope, sandhill crane, great blue heron, waterfowl, and kingfishers. Many small mammals occur here and if adjacent to water, species such as muskrat, beaver and river otter may be present. Rhizomatous Wheatgrass/Bluegrass Plant Community: The production of herbaceous species provided for good foraging for grazers. However, the lack of tall or mid growing shrubs does not benefit browsers nor provides cover for many species. As these areas tend to greens-up sooner in the spring, these sites provide early new growth for foraging large and small mammals. If located adjacent to shrub dominated sites, It provides good foraging habitat for sage grouse. Other birds which may be present include American Kestrel, hawks, and nesting birds. Bluegrass/Annual Plant Community: These communities provide limited foraging for elk and other grazers. These may be used as a foraging site by sage grouse if proximal to woody cover. Generally, these are not target plant communities for wildlife habitat management. 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. If distribution problems occur, stocking rates must be reduced to maintain plant health and vigor. Plant Community Production Carrying Capacity* (lb./ac) (AUM/ac) Basin Wildrye/Slender WG 1350-2100 .8 Slender WG/Idaho Fescue 1200-2000 .7 Dense Shrub/Slender WG 1200-2000 .5 Rhizomatous WG/Mixed Shrub 1000-1800 .6 Mixed Shrub/Bluegrass 1000-1800 .4 Rhizomatous WG/Bluegrass 1000-1800 .6 Bluegrass Sod/Annual 500-800 .2 * - 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 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 B and D. Infiltration ranges from moderately slow to moderate. Runoff potential for this site varies from low to moderate 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 opportunities for upland game and water species. Sites adjacent to perennial stream provide opportunities for fishing and water activities. The wide varieties of plants that bloom from spring until fall have an esthetic value that appeals to visitors. Other recreational uses may included hiking, camping, mountain biking, and in the winter snowshoeing and cross-country skiing.

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: Chris Krassin, Range Management Specialist, James Haverkamp, Range Management Specialist, Steven Gullion, Range Management Specialist, James Mischke, District Conservationist, and Everet Bainter, State Range Management Specialist. 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

J. Haverkamp

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)	Ray Gullion, E. Bainter
Contact for lead author	ray.gullion@wy.usda.gov 307-347-2456
Date	05/01/2008
Approved by	
Approval date	
Composition (Indicators 10 and 12) based on	Annual Production

Indicators

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

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

3. **Number and height of erosional pedestals or terracettes:** Rare to nonexistent.

4. **Bare ground from Ecological Site Description or other studies (rock, litter, lichen, moss, plant canopy are not bare ground):**
Bare ground can range from 5-10%.

5. **Number of gullies and erosion associated with gullies:** Active gullies should not be present.

6. **Extent of wind scoured, blowouts and/or depositional areas:** Minimal to nonexistent.

7. **Amount of litter movement (describe size and distance expected to travel):** Herbaceous litter expected to move in water flow patterns.

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 3.0 or greater.

9. Soil surface structure and SOM content (include type of structure and A-horizon color and thickness): Described A-horizons are up to 30 inches (76 cm) with a dark gray color (10YR 4/1) and weak to moderate granular structure. Organic matter is typically 3 to 6%.

10. Effect of community phase composition (relative proportion of different functional groups) and spatial distribution on infiltration and runoff: Plant community consists of 65-80% grasses, 20% forbs, and 0-15% shrubs. Dense plant canopy (75-95%) and litter plus moderate infiltration rates result in minimal runoff. Basal cover is typically greater than 5% for this site and effectively reduces 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.

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

Sub-dominant:

Other:

Additional:

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 1-20% of total canopy measurement with total litter (including beneath the plant canopy) from 80-95% expected. Herbaceous litter depth typically ranges from 15-30 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: 1350-2100 lb/ac (1725 lb/ac average); Metric: 1512-2352 kg/ha (1932 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 20%, noxious weed invasion, and/or presence of Kentucky bluegrass are the most common indicators of a threshold being crossed. Mountain silver sagebrush, Sandberg bluegrass, rhizomatous wheatgrass, and snowberry are common increasers. Common dandelion, thistles, cheatgrass and Kentucky bluegrass are common invasive species on disturbed sites.

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