

**Ecological site BX013X01B050****Sandy  
Bear River Valley  
10-14" P.Z.**

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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.

**MLRA notes**

Major Land Resource Area (MLRA): 013X–Eastern Idaho Plateaus

Major Land Resource Area (MLRA) 13, Eastern Idaho Plateaus, consists of approximately 5 million acres in Idaho with a small part in Utah and Wyoming, it consists of 6 Land Resource Units (LRU). These units are divisions of the MLRA based on geology, landscape, common soils, water resources and plant community potentials. The elevation ranges from approximately 4500 to 6600 feet (1370 to 2010 m) on the plateaus and foothills to as much as 9500 feet (2895 m) on the mountains. Annual precipitation ranges from 10 to 48 inches (254 to 1220 mm), with the driest areas in the Bear River Valley on the far eastern portion and the wettest areas on the mountain summits. The Fort Hall Indian Reservation and several national forests are in this MLRA, including the Caribou, Cache, and Targhee National Forests. Yellowstone and Grand Teton National Parks occur just outside the northeast boundary.

**LRU notes**

The Bear River Valley LRU is located on the far eastern side of MLRA 13 between the Bear River Divide and the Monte Cristo Range, from Woodruff, Utah at the southern end to Cokeville, Wyoming at the northern end. The total area of the LRU is approximately 340,000 acres. It shares a boundary with MLRA 47 - Wasatch and Uinta Mountains, 43B - Central Rocky Mountains and 46 - Northern Rocky Mountain Foothills (proposed in Wyoming). This LRU differs from the others in its geology, which is comprised mostly of alluvium and colluvium from the Stump Formation. Its weather patterns are such that the soil moisture regime is xeric, meaning there is a slight peak in winter precipitation in this LRU, with typical yearly precipitation between 10 to 15 inches (254 to 380 mm). The soil temperature regime of this LRU is frigid with mean annual soil temperatures ranging from 44 to 48 degrees Fahrenheit (6.7 to 8.8 C). The elevation range is from 5700 to 7000 feet (1730 to 2130 m). The soils in the Bear River Valley are dominated by young aged very deep soils developed from sandstone and shale parent material re-worked with recent alluvium. Soils are dominated by Alfisols with young argillic horizons and by Fluvents in more recent alluvium. The Bear River runs through this LRU, allowing for ample amounts of irrigation water used in the lowland areas to produce hay with smaller tributaries originating from the neighboring mountains.

**Classification relationships**

Relationship to Other Established Classification Systems National Vegetation Classification System (NVC): 3 Semi-Desert 3.B.1 Cool Semi-Desert Scrub & Grassland 3.B.1.Ne Western North American Cool Semi-Desert Scrub & Grassland Division M169 Great Basin & Intermountain Tall Sagebrush Shrubland & Steppe Macrogroup G303 Intermountain Dry Tall Sage Steppe and Shrubland Group A3182 Wyoming big sagebrush Mesic Steppe and Shrubland Alliance CEGLO01051 *Artemisia tridentata* ssp. *wyomingensis*/Hesperostipa comata Shrubland Association Ecoregions (EPA): Level I: 10 North American Deserts Level II: 10.1 Cold Deserts Level III: 10.1.4 Wyoming Basin

**Ecological site concept**

Sandy Bear River Valley 10-14" P.Z. (Sy-BRV) is an upland ecological site with at least 5 inches (13 cm) sandy loam surface textures that is not limited by chemistry but somewhat limited in water holding capacity (moderately deep to very deep with 6" AWC). • This site not does receive any additional water. • These soils are: o not saline or sodic o moderately deep to very deep o not skeletal within 20 inches (50 cm) of the soil surface; they have less than 35% rock fragments by volume in the top 20 inches (50 cm) o not violently effervescent within top 6 inches (15 cm) of mineral soil o with at least 5 inches (13 cm) depth of surface textures including sandy loam, gravelly sandy loam, and fine sandy loam • have slopes less than 30 percent • have clay content that is less than 18% within the top 6 inches (15 cm) of mineral Climate: xeric moisture regime frigid temperature regime

## Associated sites

|                     |                                                                                                                                                                 |
|---------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>BX013X01B022</b> | <b>Loamy Bear River Valley 10-14" P.Z.</b><br><br>This site has heavier soil surface textures, higher productivity and different species composition potential. |
|---------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------|

## Similar sites

|                    |                                                                                                  |
|--------------------|--------------------------------------------------------------------------------------------------|
| <b>R034AY250WY</b> | <b>Sandy Foothills and Basins West (Sy)</b><br><br>Previous version of this site used in Wyoming |
|--------------------|--------------------------------------------------------------------------------------------------|

Table 1. Dominant plant species

|            |                                                                                                      |
|------------|------------------------------------------------------------------------------------------------------|
| Tree       | Not specified                                                                                        |
| Shrub      | (1) <i>Artemisia tridentata ssp. wyomingensis</i><br>(2) <i>Artemisia tridentata ssp. tridentata</i> |
| Herbaceous | (1) <i>Hesperostipa comata</i><br>(2) <i>Achnatherum hymenoides</i>                                  |

## Legacy ID

R013XA150WY

## Physiographic features

This site occurs on hillslope and fan remnant landforms at elevations between 5,700 and 7,000 feet. This site occurs on all aspects. The slopes range from level to 30 percent. Runoff is low and flooding and ponding do not occur on this site.

Landscape Definition:

hills -- A landscape dominated by hills and associated valleys.

valley -- An elongate, relatively large, externally drained depression of the Earth's surface that is primarily developed by stream erosion or glacial activity.

Landform Definition:

hillslope -- A generic term for the steeper part of a hill between its summit and the drainage line, valley flat, or depression floor at the base of the hill.

fan remnant -- A general term for landforms that are the remaining parts of older, non-active fan- landforms, such as alluvial fans, fan aprons, inset fans, and fan skirts, that either have been dissected (erosional fan-remnants) or partially buried (non-buried fan-remnants). An erosional fan remnant must retain a relatively flat summit that is a relict fan-surface (greater than 50 percent intact). A non-buried fan-remnant is a relict surface in its entirety. Similar terms are eroded fan remnant, eroded fan remnant sideslope, ballena.

Table 2. Representative physiographic features

|              |                                                   |
|--------------|---------------------------------------------------|
| Landforms    | (1) Hills > Hillslope<br>(2) Valley > Fan remnant |
| Runoff class | Negligible to low                                 |

|                    |                                    |
|--------------------|------------------------------------|
| Flooding frequency | None                               |
| Ponding frequency  | None                               |
| Elevation          | 1,740 – 2,130 m                    |
| Slope              | 0 – 30 %                           |
| Water table depth  | 150 – 510 cm                       |
| Aspect             | Aspect is not a significant factor |

### Climatic features

Annual precipitation in the Bear River Valley ranges from 10 to 14 inches per year. Wide fluctuations may occur in yearly precipitation and result in more below average years than those with above average 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. Roughly 25 to 30 percent of the precipitation occurs during the critical growth period, but the majority of precipitation accumulates outside the growing season, creating xeric-like conditions. The wettest rainfall month is May. The dominant plants (sagebrush and cool season grasses) are well adapted to these conditions. 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. The growing season is short (60 to 90 days) and cool (critical growth period): primary growth typically occurs between May and June. Growth of native cool-season plants begins about mid-April and continues to approximately early July. Some green-up of cool-season plants usually occurs in September with adequate fall moisture.

All data is based on the 30 year average from 1981 through 2010.

**Table 3 Representative climatic features**

|                                            |             |
|--------------------------------------------|-------------|
| Frost-free period (characteristic range)   | 40-90 days  |
| Freeze-free period (characteristic range)  | 50-110 days |
| Precipitation total (characteristic range) | 250-360 mm  |
| Frost-free period (actual range)           | 40-90 days  |
| Freeze-free period (actual range)          | 30-110 days |
| Precipitation total (actual range)         | 200-410 mm  |
| Frost-free period (average)                | 60 days     |
| Freeze-free period (average)               | 80 days     |

|                               |        |
|-------------------------------|--------|
| Precipitation total (average) | 310 mm |
|-------------------------------|--------|

- (1) WOODRUFF [USC00429595], Woodruff, UT
- (2) RANDOLPH [USC00427165], Randolph, UT
- (3) SAGE 4 NNW [USC00487955], Cokeville, WY

### Influencing water features

There are no influencing water features associated with this ecological site.

### Wetland description

N/A

### Soil features

The soils of this site are moderately deep to very deep (20 to 200 inches) and formed in alluvium derived from sandstone and conglomerate. Surface textures are fine sandy loam to sandy loam and at least 5 inches (13 cm) thick. Rock fragments may be found on the soil surface or in the profile and make up less than 20 percent of the soil volume. These soils are typically well-drained and have moderate to moderately rapid permeability.

The soil moisture regime is xeric and the soil temperature regime is frigid.

Major soil series correlated to this site include: Cooley, Nautilus, Podmor, Suryon, and Wursten.

Taxonomy: Coarse-loamy, mixed, superactive, frigid Typic Calcixerolls; and Coarse-loamy, mixed, superactive, frigid Calcic Haploxerolls

Table 4. Representative soil features

|                             |                                                                          |
|-----------------------------|--------------------------------------------------------------------------|
| Parent material             | (1) Slope alluvium – calcareous conglomerate<br>(2) Alluvium – sandstone |
| Surface texture             | (1) Gravelly sandy loam<br>(2) Fine sandy loam                           |
| Drainage class              | Well drained to excessively drained                                      |
| Permeability class          | Moderate to moderately rapid                                             |
| Depth to restrictive layer  | 50 – 510 cm                                                              |
| Soil depth                  | 50 – 510 cm                                                              |
| Surface fragment cover <=3" | 10 – 20 %                                                                |
| Surface fragment cover >3"  | 0 – 10 %                                                                 |

|                                                  |                |
|--------------------------------------------------|----------------|
| Available water capacity<br>(0-101.6cm)          | 8.89 – 12.7 cm |
| Calcium carbonate equivalent<br>(0-50.8cm)       | 0 – 20 %       |
| Clay content<br>(0-15.2cm)                       | 10 – 20 %      |
| Electrical conductivity<br>(0-50.8cm)            | Not specified  |
| Sodium adsorption ratio<br>(0-50.8cm)            | Not specified  |
| Soil reaction (1:1 water)<br>(0-50.8cm)          | 10 – 7.6       |
| Subsurface fragment volume <=3"<br>(25.4-50.8cm) | 10 – 30 %      |
| Subsurface fragment volume >3"<br>(25.4-50.8cm)  | 0 – 10 %       |

## Ecological dynamics

A State-and-Transition Model (STM) diagram is depicted in this section. Thorough descriptions of each state, transition, plant community phase, and pathway are found after the model in this document. This diagram is based on available experimental research, field observations, professional consensus, and interpretations. While based on the best available information, the STM will change over time as knowledge of ecological processes increases.

Plant community composition within the same ecological site has a natural range of variability across the LRU due to the naturally occurring variability in weather, soils, and aspect. Not all managers will choose the Reference Plant Community as the management goal. Other plant communities may be desired to meet land management objectives. This is valid as long as the rangeland health attributes assessment departures are none to slight or slight to moderate from the Reference State. The biological processes on this site are complex; therefore, representative values are presented in a land management context. The species lists are representative and are not botanical descriptions of all species occurring, or potentially occurring, on this site. They are not intended to cover every situation or the full range of conditions, species, and responses for the site.

Both percent species composition by weight and percent cover are used in this ESD. Most observers find it easier to visualize or estimate percent cover for woody species (trees and shrubs). Foliar cover is used to define plant community phases and states in the State-and-Transition Model. Cover drives the transitions between communities and states because of the influence of shade and interception of rainfall.

Species composition by dry weight remains an important descriptor of the herbaceous community and of site productivity as a whole and includes both herbaceous and woody species. Calculating similarity index requires data on species composition by dry weight.

Although there is considerable qualitative experience supporting the pathways and transitions within the State-and-Transition Model, no quantitative information exists that specifically identifies threshold parameters between reference states and degraded states in this ecological site. For information on STMs, see the following citations: Bestelmeyer et.al. 2003, Bestelmeyer et.al. 2004, Bestelmeyer et.al. 2010, Bestelmeyer and Brown 2005, Briske et.al. 2008, and Stringham et.al. 2003.

A resource concern risk assessment and dominant resource concerns are provided for each Land Use, State, and/or Plant Community Phase based on NRCS resource concern and planning criteria used to determine resource treatment levels during the conservation planning process. A resource concern is the resource condition that does not meet the minimum accepted levels established by planning criteria as shown in Section III of the NRCS Field Office Technical Guide (<https://efotg.sc.egov.usda.gov/#/>).

- Low risk means a low probability for the category of resource concerns and additional assessment is typically not necessary.
- Medium risk means that the category of resource concerns could occur, and additional assessment is recommended if the identified resource is a client concern and/or objective.
- High risk means that a resource concern in that category is likely to occur.

The resource categories are: S (soil), W (water), A (air), P (plant), A (animal), E (energy), and H (human). The dominant resource concerns further refine the resource category to a specific resource concern within that category.

## 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 (%) |
|-------|-------------|--------|-----------------|----------------------|------------------|
|-------|-------------|--------|-----------------|----------------------|------------------|

Table 6. Community 1.2 plant community composition

| Group                  | Common Name                                   | Symbol | Scientific Name                            | Annual Production () | Foliar Cover (%) |
|------------------------|-----------------------------------------------|--------|--------------------------------------------|----------------------|------------------|
| <b>Grass/Grasslike</b> |                                               |        |                                            |                      |                  |
| 1                      | <b>PERENNIAL MID-SIZE COOL SEASON GRASSES</b> |        |                                            | 202-404              |                  |
|                        | needle and thread                             | HECO26 | <i>Hesperostipa comata</i>                 | 50-202               | 5-50             |
|                        | Indian ricegrass                              | ACHY   | <i>Achnatherum hymenoides</i>              | 50-202               | 5-30             |
|                        | bluebunch wheatgrass                          | PSSP6  | <i>Pseudoroegneria spicata</i>             | 50-101               | 5-20             |
|                        | Letterman's needlegrass                       | ACLE9  | <i>Achnatherum lettermanii</i>             | 10-50                | 1-10             |
|                        | squirreltail                                  | ELEL5  | <i>Elymus elymoides</i>                    | 10-50                | 1-5              |
|                        | slender wheatgrass                            | ELTR7  | <i>Elymus trachycaulus</i>                 | 0-50                 | 0-5              |
|                        | prairie Junegrass                             | KOMA   | <i>Koeleria macrantha</i>                  | 0-50                 | 0-5              |
|                        | Sandberg bluegrass                            | POSE   | <i>Poa secunda</i>                         | 0-50                 | 0-5              |
|                        | muttongrass                                   | POFE   | <i>Poa fendleriana</i>                     | 0-50                 | 0-5              |
| 2                      | <b>RHIZOMATOUS GRASSES</b>                    |        |                                            | 50-101               |                  |
|                        | thickspike wheatgrass                         | ELLAL  | <i>Elymus lanceolatus ssp. lanceolatus</i> | 50-101               | 5-10             |
|                        | western wheatgrass                            | PASM   | <i>Pascopyrum smithii</i>                  | 50-101               | 5-10             |
| 3                      | <b>MISC. GRASSES/GRASSLIKES</b>               |        |                                            | 50-101               |                  |
|                        | plains reedgrass                              | CAMO   | <i>Calamagrostis montanensis</i>           | 0-50                 | 0-5              |
|                        | needleleaf sedge                              | CADU6  | <i>Carex duriuscula</i>                    | 0-50                 | 0-5              |
|                        | Sandberg bluegrass                            | POSE   | <i>Poa secunda</i>                         | 10-50                | 1-5              |
| <b>Forb</b>            |                                               |        |                                            |                      |                  |
| 4                      | <b>PERENNIAL FORBS</b>                        |        |                                            | 50-91                |                  |
|                        | aster                                         | SYMPH4 | <i>Symphyotrichum</i>                      | 0-50                 | 0-5              |
|                        | buckwheat                                     | ERIOG  | <i>Eriogonum</i>                           | 10-50                | 1-5              |
|                        | lupine                                        | LUPIN  | <i>Lupinus</i>                             | 0-50                 | 0-5              |
|                        | spiny phlox                                   | PHHO   | <i>Phlox hoodii</i>                        | 10-50                | 1-5              |
|                        | longleaf phlox                                | PHLO2  | <i>Phlox longifolia</i>                    | 0-30                 | 0-3              |

|                   |                          |        |                                               |         |      |
|-------------------|--------------------------|--------|-----------------------------------------------|---------|------|
|                   | hoary tansyaster         | MACA2  | <i>Machaeranthera canescens</i>               | 0-30    | 0-3  |
|                   | bluebells                | MERTE  | <i>Mertensia</i>                              | 0-30    | 0-3  |
|                   | milkvetch                | ASTRA  | <i>Astragalus</i>                             | 0-30    | 0-3  |
|                   | tapertip hawksbeard      | CRAC2  | <i>Crepis acuminata</i>                       | 0-30    | 0-3  |
|                   | ragwort                  | SENEC  | <i>Senecio</i>                                | 0-30    | 0-3  |
|                   | scarlet globemallow      | SPCO   | <i>Sphaeralcea coccinea</i>                   | 0-30    | 0-3  |
|                   | Munro's globemallow      | SPMU2  | <i>Sphaeralcea munroana</i>                   | 0-30    | 0-3  |
|                   | stemless mock goldenweed | STAC   | <i>Stenotus acaulis</i>                       | 0-30    | 0-3  |
|                   | western yarrow           | ACMIO  | <i>Achillea millefolium var. occidentalis</i> | 0-30    | 0-3  |
|                   | agoseris                 | AGOSE  | <i>Agoseris</i>                               | 0-30    | 0-3  |
|                   | locoweed                 | OXYTR  | <i>Oxytropis</i>                              | 0-30    | 0-3  |
|                   | flaxleaf plainsmustard   | SCLI   | <i>Schoenocrambe linifolia</i>                | 0-30    | 0-3  |
|                   | pussytoes                | ANTEN  | <i>Antennaria</i>                             | 0-30    | 0-3  |
|                   | beardtongue              | PENST  | <i>Penstemon</i>                              | 0-30    | 0-3  |
|                   | fleabane                 | ERIGE2 | <i>Erigeron</i>                               | 0-30    | 0-3  |
|                   | larkspur                 | DELPH  | <i>Delphinium</i>                             | 0-10    | 0-1  |
|                   | desertparsley            | LOMAT  | <i>Lomatium</i>                               | 0-10    | 0-1  |
|                   | onion                    | ALLIU  | <i>Allium</i>                                 | 0-10    | 0-1  |
|                   | bitter root              | LERE7  | <i>Lewisia rediviva</i>                       | 0-10    | 0-1  |
|                   | hollyleaf clover         | TRGY   | <i>Trifolium gymnocarpon</i>                  | 0-10    | 0-1  |
|                   | clover                   | TRIFO  | <i>Trifolium</i>                              | 0-10    | 0-1  |
|                   | violet                   | VIOLA  | <i>Viola</i>                                  | 0-10    | 0-1  |
|                   | deathcamas               | ZIGAD  | <i>Zigadenus</i>                              | 0-10    | 0-1  |
|                   | cryptantha               | CRYPT  | <i>Cryptantha</i>                             | 0-10    | 0-1  |
|                   | rockcress                | ARABI2 | <i>Arabis</i>                                 | 0-10    | 0-1  |
|                   | sandwort                 | ARENA  | <i>Arenaria</i>                               | 0-10    | 0-1  |
|                   | sego lily                | CANU3  | <i>Calochortus nuttallii</i>                  | 0-10    | 0-1  |
|                   | Indian paintbrush        | CASTI2 | <i>Castilleja</i>                             | 0-10    | 0-1  |
|                   | pale bastard toadflax    | COUMP  | <i>Comandra umbellata ssp. pallida</i>        | 0-10    | 0-1  |
|                   | western wallflower       | ERAS2  | <i>Erysimum asperum</i>                       | 0-10    | 0-1  |
|                   | sagebrush buttercup      | RAGL   | <i>Ranunculus glaberrimus</i>                 | 0-10    | 0-1  |
|                   | stonecrop                | SEDUM  | <i>Sedum</i>                                  | 0-10    | 0-1  |
| 5                 | <b>ANNUAL FORBS</b>      |        |                                               | 0-10    |      |
|                   | rockjasmine              | ANDRO3 | <i>Androsace</i>                              | 0-10    | 0-1  |
|                   | bushy bird's beak        | CORA5  | <i>Cordylanthus ramosus</i>                   | 0-10    | 0-1  |
| <b>Shrub/Vine</b> |                          |        |                                               |         |      |
| 6                 | <b>SAGEBRUSH</b>         |        |                                               | 135-252 |      |
|                   | Wyoming big sagebrush    | ARTRW8 | <i>Artemisia tridentata ssp. wyomingensis</i> | 202-252 | 5-15 |
|                   | basin big sagebrush      | ARTRT  | <i>Artemisia tridentata ssp. tridentata</i>   | 0-252   | 0-15 |
| 7                 | <b>MISC. SHRUBS</b>      |        |                                               | 22-50   |      |
|                   | yellow rabbitbrush       | CHVI8  | <i>Chrysothamnus viscidiflorus</i>            | 10-50   | 1-5  |
|                   | rubber rabbitbrush       | ERNA10 | <i>Ericameria nauseosa</i>                    | 0-50    | 0-5  |
|                   | Gardner's saltbush       | ATGA   | <i>Atriplex gardneri</i>                      | 0-30    | 0-3  |
|                   | granite prickly phlox    | LIPU11 | <i>Linanthus pungens</i>                      | 0-30    | 0-3  |
|                   | spineless horsebrush     | TECA2  | <i>Tetradymia canescens</i>                   | 0-30    | 0-3  |
|                   | shortspine horsebrush    | TESP2  | <i>Tetradymia spinosa</i>                     | 0-30    | 0-3  |

|  |                    |        |                                              |      |     |
|--|--------------------|--------|----------------------------------------------|------|-----|
|  | plains pricklypear | OPPO   | <i>Opuntia polyacantha</i>                   | 0-10 | 0-1 |
|  | bud sagebrush      | PIDE4  | <i>Picrothamnus desertorum</i>               | 0-10 | 0-1 |
|  | slender buckwheat  | ERMIL2 | <i>Eriogonum microthecum var. laxiflorum</i> | 0-10 | 0-1 |
|  | winterfat          | KRLA2  | <i>Krascheninnikovia lanata</i>              | 0-10 | 0-1 |

Table 7. Community 1.3 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 4.2 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 6.2 plant community composition

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

Table 12. Community 7.1 plant community composition

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

Table 13. Community 7.2 plant community composition

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

## Animal community

The following table lists suggested stocking rates for cattle under continuous season-long grazing under normal growing conditions with a harvest efficiency (HE) of 25 percent. 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). A field visit is required to document actual plant composition and production. More precise carrying capacity estimates, considering forage preference and accessibility (slope, distance to water, etc.), should be calculated using field data, particularly when grazers other than cattle are involved. Under more intensive grazing management, improved harvest efficiencies (up to 35 percent) can result in an increased carrying capacity, but recovery time for upland sites is much longer. If distribution problems occur, stocking rates should be reduced or facilitating conservation practices (i.e., cross-fencing, water development) implemented to maintain plant health and vigor. Stocking rates are expressed in Animal Unit Months (AUMs) which is defined as the amount of forage consumed by a 1,000 pound cow with a less than 4 month old calf at her side. Plant Community Production (lbs./ac.) Initial Suggested Stocking Rate (AUMs/ac.)\* Ac./AUM 1.1 Big Sagebrush/Bunchgrass 700-900-1100 0.1 10 1.2 Bunchgrass/Big Sagebrush 700-900-1100 0.15 7 1.3 Bunchgrass 700-900-1100 0.2 5 2.1 Big Sagebrush/Short-Stature Grass 500-700-900 0.06 17 2.2 Short-stature Grass/Big Sagebrush 500-700-900 0.1 10 3.1 Big Sagebrush/Rabbitbrush 400-600-800 0.06 17 3.2 Rabbitbrush/Rhizomatous Wheatgrass 400-600-800 0.1 10 4.1 Big Sagebrush/Annual 400-600-800 0.05 20 4.2 Annual 400-600-800 0.05 20 Irrigated Pasture 2000-3000-4000 0.82 1.2 Dryland Pasture 700-900-1100 0.25 4 \* Continuous, season-long grazing by cattle under average growing conditions. Calculation for stocking rates are as follows: Using RV values for production, take forage palatable to grazing cattle and multiply by 0.25 HE and divide by 912.5 lbs./AUM air-dry weight (ADW) to arrive at the initial suggested stocking rate in AUMs/acre. Not all kinds of livestock or wildlife have the same forage demand as a 1000-pound lactating cow. In addition, forage demand varies within a species depending on its class, i.e., its growth rate (e.g. heifers and steers vs. mature cow), lactating and maintenance (e.g., dry cow vs cow with calf). For this reason, animal unit equivalents (AUE) are provided in the National Range & Pasture Handbook to assist with this approximate determination of forage demand based on the kind, class and size of animal (NRPH, 2003). For cattle with a different average weight than a 1000 pound average, AUE can be adjusted (i.e., every 100 pounds of animal weight equates to about 0.10 Animals Units thus a 1200-pound cow with a calf would be 1.2 AUE . Grazing by domestic livestock is one of the major income-producing industries in the area. Rangeland in this area may provide year-long forage for cattle, sheep, or horses. During the dormant period, the forage for livestock must be supplemented with protein because the quality does not meet minimum livestock requirements. Distance to water, shrub density, and slope can affect grazing capacity within a management unit. Accessibility adjustments should be made for the planning area as necessary. For example, 30 percent of a management unit may have 25 percent slopes and distances of greater than one mile from water, resulting in a 50 percent reduction in grazing access; therefore, the adjustment is calculated for 30 percent of the unit (i.e. 50 percent reduction on 30 percent of the management unit). Fencing, slope length, management, access, terrain, kind and class of livestock, and breeds are all

factors that can increase or decrease the percent of grazing access within a management unit. Adjustments should be made that incorporate these factors when calculating the carrying capacity of a management unit. Wildlife Interpretations: Sagebrush grassland habitats are critically important for wildlife. The LRU provides crucial winter range for mule deer, elk, pronghorn and moose. Portions of the LRU fall within overlapping crucial winter range delineated for three species of big game. Nearly all of the LRU in Wyoming supports a designated migration corridor and numerous associated stopover habitats, where thousands of mule deer from the Wyoming Range Herd Unit move north and south between summer and winter ranges. Healthy vegetative communities within migration stopover areas are extremely important as forage and cover where mule deer may spend several days resting and feeding to refuel before moving again. The middle segment of the LRU (east and west of the Bear River) is within sage grouse core habitat, providing breeding leks, nesting, early brood rearing, late brood rearing, and winter habitats. Maintaining intact high quality sagebrush grassland habitats with a diversity of successional stages is vitally important for meeting the needs of wildlife using this landscape. Wildlife Habitat Threats: Winter moisture characteristics of the BRV LRU promote environmental conditions ideal for cheatgrass establishment and persistence. Cheatgrass presence is increasing and competing with native perennial grasses and forbs to deteriorate habitat function for big game, sage grouse and other sagebrush obligate wildlife. Advanced cheatgrass invasion is expected to alter fire regimes to a short Fire Return Interval outside the natural range of variability, where sagebrush stands burn frequently resulting in a reduction of browse and cover availability for wildlife. Eventually, shrub cover dominance could revert to green (aka yellow rabbitbrush in USDA PLANTS) or rubber rabbitbrush, significantly impacting wildlife dependent on sagebrush in this landscape for survival. Current and future anthropogenic impacts to sagebrush grasslands include agriculture expansion, energy development, water storage projects, and subdivision/residential development. Increasing demand for expanding private lands hay production has seen conversion of sagebrush stands in and near sage grouse core habitat to center pivot sprinkler irrigation. Sage grouse may use these new fields during the late brood rearing period, but there is a loss of important sagebrush cover for escape, lekking, nesting, and winter cover/forage as critical life stage habitat needs for sage grouse. Energy transmission projects have recently created interest and opportunities for solar farm development in the LRU. These solar energy projects could permanently convert site specific sagebrush-grassland habitat to industrial development locations with negative cumulative impacts for sage grouse, wintering big game, and other sagebrush dependent wildlife. Aesthetic values of the Cokeville area may attract future demand for small acreage home developments, especially in the Smith's Fork River Valley and Raymond Mountain foothills. Increased fencing and sagebrush removal usually associated with residential development could be extremely detrimental to big game migration and migration stopover habitats. Wildlife Habitat Uses: The Big Sagebrush/Bunchgrass Plant Community, with shrub canopies ranging from 15 to 25 percent, provides transitional or crucial winter seasonal habitat for mule deer, elk, pronghorn and sage grouse. The combination of healthy sagebrush and herbaceous vegetation provide adequate escape and thermal cover for mule deer and preferred nesting and early brood rearing habitat for sage grouse. Sagebrush obligate bird species of Brewer's sparrow, sage thrasher, and sage sparrow depend on denser sagebrush canopies (20 percent) and sagebrush heights of 35 to 70 cm for foraging, escape cover, and nesting. Pygmy rabbits also prefer dense tall Wyoming and basin big sagebrush stands with deeper soils for burrows at the base of sagebrush plants. Wyoming big sagebrush serves as important browse for deer, elk, and pronghorn during the winter as it stands erect in deep snow, allowing ungulates relatively easy access without pawing and expenditure of energy reserves. Mountain big sagebrush and associated mixed mountain shrub species of true mountain mahogany, serviceberry, and antelope bitterbrush are found at the higher precipitation fringe areas of this zone also provide important winter browse for big game including moose. Associated under-story forbs and grasses are nutritionally important during the spring period for big game coming out of winter, and for fall migration stopover. The Disturbed State reduces sagebrush as important wildlife cover and browse in exchange for dominance of sprouting green rabbitbrush of a lesser value for wildlife. Diversity and productivity of under-story species diminishes, with loss of bunchgrasses and increases in rhizomatous grasses and annual forbs. This transition negatively affects vertical and horizontal cover, and reduces forage values for several wildlife species, including designated sage grouse core habitat. The Invaded State exhibits sagebrush stand under-stories dominated by invasive annual grasses, particularly cheatgrass. Conversion of native perennial grasses and forbs to cheatgrass is detrimental for maintaining diverse structural cover and nutritional forage. Hiding cover and forage niches for sagebrush obligate songbirds disappears, forb and insect production for young sage grouse chicks is reduced, nutritional value of big game transitional season forage becomes inconsistent or is lost, and mid-size bunchgrass species able to stand up in deep snows as forage for wintering elk are reduced. Short Fire Return Intervals may preclude the re-establishment and persistence of sagebrush stands, negatively affecting all sagebrush dependent wildlife, especially sage grouse core habitat and thousands of migrating and wintering mule deer that use the area.

## Hydrological functions

Water is the principal factor limiting forage production on this site. This site is dominated by soils in hydrologic group B (infiltration rate of 0.15 to 0.3 in/hr), with localized areas in hydrologic groups A (infiltration rate of 0.3 in/hr) and C (infiltration rate of 0.05 to 0.15 in/hr). Infiltration ranges from rapid 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 percent ground cover have the greatest potential for high infiltration and lower runoff. Areas where ground cover is less than 50 percent 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 are not typically present. Water flow patterns should be barely distinguishable if at all present. Pedestals are only slightly present in association with bunchgrasses and shrubs. Herbaceous litter expected to move only in short distances (to leeward side of shrubs) due to wind. Woody litter will show short movement (less than 1 foot) associated with normal high precipitation events on steeper slopes (greater than 10 percent). Chemical and physical crusts are rare to non-existent.

## Recreational uses

This site provides hunting opportunities for upland game species. The wide variety of plants which bloom in the spring have an aesthetic value that appeals to recreationists.

## Inventory data references

Information presented here has been derived from historic and recent clipping data and other inventory data. Field observations from range trained personnel were also used. Inventory Data Resources include: 11 Tier I NRCS Ecological Site Inventory (NRCS-ESI) points (2013) 2 historic data sets 2 Soil Survey-ESI points (2019)

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Other references

Site concept, plant community data, and interpretations are based on ecological site descriptions (ESDs) from MLRA 34A-Foothills and Basins West (10-14W).  
This ESD replaces R034AY250WY Sandy MLRA 34A-Foothills and Basins West (Sy 10-14W), but only within geographic extent of the Bear River Valley LRU.  
Further data collection and ecological site refinement are ongoing until the ESD has reached "Approved" status.

Contributors

Karen Clause  
Bryan Christensen

Approval

Kirt Walstad, 4/01/2025

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Rangeland health reference sheet

**Interpreting Indicators of Rangeland Health** is a qualitative assessment protocol used to determine ecosystem condition based on benchmark characteristics described in the Reference Sheet. A suite of 17 (or more) indicators are typically considered in an assessment. The ecological site(s) representative of an assessment location must be known prior to applying the protocol and must be verified based on soils and climate. Current plant community cannot be used to identify the ecological site.

|                          |            |
|--------------------------|------------|
| Author(s)/participant(s) |            |
| Contact for lead author  |            |
| Date                     | 05/01/2024 |
| Approved by              |            |

|                                             |                   |
|---------------------------------------------|-------------------|
| Approval date                               |                   |
| Composition (Indicators 10 and 12) based on | Annual Production |

## Indicators

**1. Number and extent of rills:**

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

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

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

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**5. Number of gullies and erosion associated with gullies:**

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

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**7. Amount of litter movement (describe size and distance expected to travel):**

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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):**

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**9. Soil surface structure and SOM content (include type of structure and A-horizon color and thickness):**

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**10. Effect of community phase composition (relative proportion of different functional groups) and spatial distribution on infiltration and runoff:**

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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):**

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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:**

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**13. Amount of plant mortality and decadence (include which functional groups are expected to show mortality or decadence):**

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**14. Average percent litter cover (%) and depth ( in):**

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**15. Expected annual annual-production (this is TOTAL above-ground annual-production, not just forage annual-production):**

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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:**

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**17. Perennial plant reproductive capability:**

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