

# Ecological site R023XY058NV GRANITIC LOAM 14-16 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.

## Ecological site concept

Currently there is only a draft of the initial concept for this ecological site. The initial concept for this site places it within the Ashy or Loamy Skeletal Mod Deep 10-20 PZ High-Resilience Mountain Big Sagebrush and Idaho Fescue Ecological Site Group. To view the General STM and other information available for this ESG please go to <https://edit.jornada.nmsu.edu/catalogs/esg/023X/R023XY906NV> This site is slightly less productive than the modal site with only 1300 lbs/ac in favorable years. Soils on this site are well-drained, formed from granitic rock sources, and have a shallow rooting depth to soft bedrock. Water holding capacity is low. Needlegrasses (i.e. Letterman's, Columbia, and western) dominate the grass community rather than Idaho fescue and bluebunch wheatgrass. This site is similar to the group modal site with 2 stable states.

## Associated sites

|                    |                                  |
|--------------------|----------------------------------|
| <b>R023XY043NV</b> | <b>GRANITIC SLOPE 14-16 P.Z.</b> |
| <b>R023XY048NV</b> | <b>GRANITIC SLOPE 16+ P.Z.</b>   |
| <b>R023XY068NV</b> | <b>GRANITIC LOAM 8-10 P.Z.</b>   |

## Similar sites

|                    |  |
|--------------------|--|
| <b>R023XY048NV</b> | <b>GRANITIC SLOPE 16+ P.Z.</b><br>steeper slopes; higher precipitation; BRMA4 dominant grass                 |
| <b>R023XY043NV</b> | <b>GRANITIC SLOPE 14-16 P.Z.</b><br>steeper slopes; major components of FEID and PSSPS; less productive site |

**Table 1. Dominant plant species**

|       |   |
|-------|---|
| Tree  | Not specified                                 |
| Shrub | (1) <i>Artemisia tridentata ssp. vaseyana</i> |

|            |                        |
|------------|------------------------|
| Herbaceous | (1) <i>Achnatherum</i> |
|------------|------------------------|

### Physiographic features

This site occurs on rolling hills and bordering mountains on all aspects. Slopes range from 2 to 30 percent. Elevations are 6500 to about 8000 feet.

Table 2. Representative physiographic features

|           |              |
|-----------|--------------|
| Landforms | (1) Mountain |
|-----------|--------------|

### Climatic features

The climate associated with this site is semiarid and characterized by cool, moist winters and warm, dry summers. Average annual precipitation is 14 to 16 inches. Mean annual air temperature is 42 to 45 degrees F. The average growing season is about 70 to 100 days.

Nevada's climate is predominantly arid, with large daily ranges of temperature, infrequent severe storms, heavy snowfall in the higher mountains, and great location variations with elevation. Three basic geographical factors largely influence Nevada's climate: continentality, latitude, and elevation. Continentality is the most important factor. The strong continental effect is expressed in the form of both dryness and large temperature variations. Nevada lies on the eastern, lee side of the Sierra Nevada Range, a massive mountain barrier that markedly influences the climate of the State. The prevailing winds are from the west, and as the warm moist air from the Pacific Ocean ascend the western slopes of the Sierra Range, the air cools, condensation occurs and most of the moisture falls as precipitation. As the air descends the eastern slope, it is warmed by compression, and very little precipitation occurs. The effects of this mountain barrier are felt not only in the West but throughout the state, with the result that the lowlands of Nevada are largely desert or steppes. The temperature regime is also affected by the blocking of the inland-moving maritime air. Nevada sheltered from maritime winds, has a continental climate with well-developed seasons and the terrain responds quickly to changes in solar heating.

Nevada lies within the mid-latitude belt of prevailing westerly winds which occur most of the year. These winds bring frequent changes in weather during the late fall, winter and spring months, when most of the precipitation occurs. To the south of the mid-latitude westerlies, lies a zone of high pressure in subtropical latitudes, with a center over the Pacific Ocean. In the summer, this high-pressure belt shifts northward over the latitudes of Nevada, blocking storms from the ocean. The resulting weather is mostly clear and dry during the summer and early fall, with scattered thundershowers. The eastern portion of the state receives significant summer thunderstorms generated from monsoonal moisture pushed up from the Gulf of California, known as the North American monsoon. The monsoon system peaks in August and by October the monsoon high over the Western U.S. begins to weaken and the precipitation retreats southward towards the tropics (NOAA 2004).

Average annual precipitation is 16 to over 20 inches. Mean annual air temperature is 41 to 44 degrees F. The average growing season is about 50 to 70 days.

Mean annual precipitaion at the Bear Creek, Nevada SNOTEL station (170501020301) is 37.69 inches.

monthly mean precipitation is:

January 3.84; February 3.75; March 4.38; April 4.9;  
 May 3.99; June 2.82; July .95; August 1.66;  
 September 1.22; October 2.12;  
 November 3.67; December 4.38.

Table 3 Representative climatic features

|                               |         |
|-------------------------------|---------|
| Frost-free period (average)   | 90 days |
| Freeze-free period (average)  |         |
| Precipitation total (average) | 380 mm  |

## Influencing water features

There are no influencing water features associated with this site.

## Soil features

The soils associated with this site have formed in residuum derived from granitic rock sources. They have a shallow effective rooting depth to soft bedrock. Soil texture ranges from coarse at the surface to moderately-fine in the subsoil. These soils have a low available water capacity. The soils are well drained, runoff is medium to rapid, and permeability is moderately slow.

## Ecological dynamics

Where management results in abusive grazing use by livestock and/or feral horses, needlegrasses decrease as mountain big sagebrush, snowberry, and arrowleaf balsamroot increase. Cheatgrass and thistles are the plant species most likely to invade this site.

### Fire Ecology:

Presettlement fire return intervals in mountain big sagebrush communities varied from 15 to 25 years. Plants are readily killed in all seasons, even light severity fires. Mountain big sagebrush is highly susceptible to injury from fire. It is often top-killed by fire and will not resprout. Fires top-kill mountain snowberry. Although plant survival may be variable, mountain snowberry root crowns usually survive even severe fires. Mountain snowberry sprouts from basal buds at the root crown following fire. Little specific information is available on adaptations of Letterman's needlegrass to fire. It is morphologically similar to Columbia needlegrass, which is only slightly to moderately damaged by fire. Season of burn affects the plant's ability to survive a fire. Post-fire regeneration is through seeding and tillering. Columbia needlegrass is only slightly to moderately damaged by fire, because it has relatively few culms per clump which may help to minimize the amount of subsurface heat transfer and subsequent damage. Western needlegrass is moderately damaged by fire. The recovery time is between 3 and 5 years. Idaho fescue grows in a dense, fine-leaved tuft. Fires tend to burn within the accumulated fine leaves at the base of the plant and may produce temperatures sufficient to kill some of the root crown. Mature Idaho fescue plants are commonly reported to be severely damaged by fire in all seasons. Basin wildrye is top-killed by fire. Older basin wildrye plants with large proportions of dead material within the perennial crown can be expected to show higher mortality due to fire than younger plants having little debris. Basin wildrye is generally tolerant of fire but may be damaged by early season fire combined with dry soil conditions.

## State and transition model

### Additional community tables

Table 4. Community 1.1 plant community composition

| Group                  | Common Name                                   | Symbol | Scientific Name                                 | Annual Production () | Foliar Cover (%) |
|------------------------|---|--------|---|----------------------|------------------|
| <b>Grass/Grasslike</b> |   |        |   |                      |                  |
| 1                      | <b>Primary Perennial Grasses</b>              |        |   | 358-740              |                  |
|                        | Letterman's needlegrass                       | ACLE9  | <i>Achnatherum lettermanii</i>                  | 123-247              | –                |
|                        | Columbia needlegrass                          | ACNEN2 | <i>Achnatherum nelsonii ssp. nelsonii</i>       | 123-247              | –                |
|                        | western needlegrass                           | ACOCO  | <i>Achnatherum occidentale ssp. occidentale</i> | 62-123               | –                |
|                        | Idaho fescue                                  | FEID   | <i>Festuca idahoensis</i>                       | 25-62                | –                |
|                        | basin wildrye                                 | LECI4  | <i>Leymus cinereus</i>                          | 25-62                | –                |
| 2                      | <b>Secondary Perennial Grasses/Grasslikes</b> |        |   | 62-123               |                  |
|                        | mountain brome                                | BRMA4  | <i>Bromus marginatus</i>                        | 7-37                 | –                |
|                        | sedge   | CAREX  | <i>Carex</i>                                    | 7-37                 | –                |
|                        | oniongrass                                    | MEBU   | <i>Melica bulbosa</i>                           | 7-37                 | –                |
|                        | Cusick's bluegrass                            | POCUE2 | <i>Poa cusickii ssp. epilis</i>                 | 7-37                 | –                |
|                        | bluebunch wheatgrass                          | PSSPS  | <i>Pseudoroegneria spicata ssp. spicata</i>     | 7-37                 | –                |
| <b>Forb</b>            |   |        |   |                      |                  |
| 3                      | <b>Perennial</b>                              |        |   | 62-185               |                  |
|                        | milkvetch                                     | ASTRA  | <i>Astragalus</i>                               | 7-25                 | –                |
|                        | arrowleaf balsamroot                          | BASA3  | <i>Balsamorhiza sagittata</i>                   | 7-25                 | –                |
|                        | tapertip hawksbeard                           | CRAC2  | <i>Crepis acuminata</i>                         | 7-25                 | –                |
|                        | larkspur                                      | DELPH  | <i>Delphinium</i>                               | 7-25                 | –                |
|                        | lupine  | LUPIN  | <i>Lupinus</i>                                  | 7-25                 | –                |

|                   |                         |       |   |         |   |
|-------------------|-------------------------|-------|---|---------|---|
|                   | mule-ears               | WYETH | <i>Wyethia</i>                            | 7-25    | - |
| <b>Shrub/Vine</b> |                         |       |   |         |   |
| 4                 | <b>Primary Shrubs</b>   |       |   | 148-308 |   |
|                   | mountain big sagebrush  | ARTRV | <i>Artemisia tridentata ssp. vaseyana</i> | 123-247 | - |
|                   | mountain snowberry      | SYOR2 | <i>Symphoricarpos oreophilus</i>          | 25-62   | - |
| 5                 | <b>Secondary Shrubs</b> |       |   | 62-185  |   |
|                   | Utah serviceberry       | AMUT  | <i>Amelanchier utahensis</i>              | 12-37   | - |
|                   | antelope bitterbrush    | PUTR2 | <i>Purshia tridentata</i>                 | 12-37   | - |
|                   | currant                 | RIBES | <i>Ribes</i>                              | 12-37   | - |

## Animal community

Livestock Interpretations: This site is suitable for livestock grazing. Grazing management should be keyed to perennial grass production. Letterman's needlegrass begins growth early in the year and remains green throughout the relatively long growing season, thus, making it valuable forage for livestock. Columbia needlegrass provides valuable forage for all classes of livestock. Overall production is generally low in the upper sagebrush and mountain brush zones and at the limits of its range where Columbia needlegrass grows only in scattered patches. It is especially valuable to cattle and horses on summer ranges and to domestic sheep on lambing grounds. It is more often cropped closely by cattle and horses than by sheep. Columbia needlegrass is palatable to livestock throughout its range. As with most needlegrasses, it is most palatable early in the season before the foliage becomes coarse and wiry. Palatability to cows and horses is increased because large amounts of fine leafage remain green throughout the growing season. Palatability of Columbia needlegrass is described as fair to good for cattle and horses, becoming nearly unpalatable at maturity. Western needlegrass has a spreading and deeply penetrating root system, which makes it resistant to trampling. Idaho fescue provides important forage for many types of domestic livestock. The foliage cures well and is preferred by livestock in late fall and winter. The early growth and abundant production of basin wildrye make it a valuable source of forage for livestock. It is important forage for cattle and is readily grazed by cattle and horses in early spring and fall. Though coarse-textured during the winter, basin wildrye may be utilized more frequently by livestock and wildlife when snow has covered low shrubs and other grasses. Mountain big sagebrush is eaten by domestic livestock but has long been considered to be of low palatability, and a competitor to more desirable species. Snowberry is readily eaten by all classes of livestock, particularly domestic sheep. Stocking rates vary over time depending upon season of use, climate variations, site, and previous and current management goals. A safe starting stocking rate is an estimated stocking rate that is fine tuned by the client by adaptive management through the year and from year to year. Wildlife Interpretations: Mountain big sagebrush is highly preferred and nutritious winter forage for mule deer and elk. Sagebrush-grassland communities provide critical sage-grouse breeding and nesting habitats. Meadows surrounded by sagebrush may be used as feeding and strutting grounds. Sagebrush is a crucial component of their diet year-round, and sage-grouse select sagebrush almost exclusively for cover. Sage-grouse prefer mountain big sagebrush and Wyoming big sagebrush communities to basin big sagebrush communities. Snowberry is an important forage species for deer and elk on high elevation summer ranges. Snowberry is frequently one of the first species to leaf out, making it a highly sought after food in the early spring. Letterman's needlegrass provides valuable forage for many species of wildlife. It is consumed by mule deer and is most palatable early in the season before the foliage becomes coarse and wiry. Columbia needlegrass provides valuable forage for many species of wildlife. It is also consumed by mule deer and other wildlife species throughout the growing season. Needlegrasses are a significant component in the diet of pocket gophers. Columbia needlegrass is palatable to many species of wildlife throughout its range. As with most needlegrasses, it is most palatable early in the season before the foliage becomes coarse and wiry. Palatability of Columbia needlegrass is described as fair for wildlife overall, becoming nearly unpalatable at maturity. Western needlegrass provides valuable forage for many species of wildlife. Idaho fescue provides important forage for several wildlife species. It is reported to be good forage for pronghorn, and deer in ranges of northern Nevada. Basin wildrye provides winter forage for mule deer, though use is often low compared to other native grasses. Basin wildrye provides summer forage for black-tailed jackrabbits. Because basin wildrye remains green throughout early summer, it remains available for small mammal forage for longer time than other grasses.

## Recreational uses

Aesthetic value is derived from the diverse floral and faunal composition and the colorful flowering of wild flowers and shrubs during the spring and early summer. This site offers rewarding opportunities to photographers and for nature study. This site is used for camping and hiking and has potential for upland and big game hunting.

## Other products

Native Americans used big sagebrush leaves and branches for medicinal teas, and the leaves as a fumigant. Bark was woven into mats, bags and clothing. Basin wildrye was used as bedding for various Native American ceremonies, providing a cool place for dancers to stand.

## Other information

Mountain snowberry is useful for establishing cover on bare sites and has done well when planted onto roadbanks. Letterman's needlegrass has been used successfully in revegetating mine spoils. This species also has good potential for erosion control. Basin wildrye is useful in mine reclamation, fire rehabilitation and stabilizing disturbed areas. Its usefulness in range seeding, however, may be limited by initially weak stand establishment.

### Type locality

|                                 |  |
|---------------------------------|--|
| Location 1: Humboldt County, NV |  |
| Township/Range/Section          | T46N R31E S13  |
| UTM zone                        | N  |
| UTM northing                    | 379249   |
| UTM easting                     | 4636084  |
| Latitude                        | 41° 52 2   |
| Longitude                       | 118° 27 18   |
| General legal description       | SE 1/4, Bilk Creek Mountains, Humboldt County, Nevada. |

### Other references

Fire Effects Information System (Online; <http://www.fs.fed.us/database/feis/plants/>).

USDA-NRCS Plants Database (Online; <http://www.plants.usda.gov>).

### Contributors

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T Stringham (UNR under contract with BLM)

### Approval

Kendra Moseley, 4/10/2025

### 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.

|                          |  |
|--------------------------|--|
| Author(s)/participant(s) |  |
|--------------------------|--|

|   |                   |
|---|-------------------|
| Contact for lead author                     |                   |
| Date  | 04/20/2026        |
| 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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