

## Ecological site R023XY094NV ASHY SLOPE 12-14 P.Z.

Last updated: 4/10/2025  
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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 Loamy 10-20 PZ Mountain Big Sagebrush and Bluebunch Wheatgrass 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/R023XY905NV> This site is less productive than the modal site with only 1000 lbs/ac in normal years. Slopes typically range from 4 to 15 percent. Soils in this site have high amounts of vitric volcanic ash and glass throughout the soil profile, allowing for high available water capacity. Unlike the group modal site, Idaho fescue is the dominant grass on this site. This site is similar to the group modal with a five state model.

### Similar sites

<b>R023XY071NV</b>	<b>ASHY LOAM 10-12 P.Z.</b> ARTRT dominant shrub
<b>R023XY066NV</b>	<b>ASHY LOAM 14-16 P.Z.</b> ARTRV-PUTR2 codominant shrubs
<b>R023XY082NV</b>	<b>LOAMY FAN 10-12 P.Z.</b> ACTH7-POA-LECI4 codominant grasses
<b>R023XY072NV</b>	<b>ASHY SLOPE 10-12 P.Z.</b> ARTRW8 dominant shrub
<b>R023XY007NV</b>	<b>LOAMY 14-16 P.Z.</b> FEID-PSSPS codominant
<b>R023XY096NV</b>	<b>ASHY SANDY LOAM 10-12 P.Z.</b> ACTH7-PSSPS-FEID codominant
<b>R023XY020NV</b>	<b>LOAMY 10-12 P.Z.</b> FEID minor species

**Table 1. Dominant plant species**

Tree	Not specified
Shrub	(1) <i>Artemisia tridentata ssp. vaseyana</i>
Herbaceous	(1) <i>Festuca idahoensis</i> (2) <i>Achnatherum occidentale ssp. occidentale</i>

### Physiographic features

This site occurs on backslopes of plateaus, ash flows, and hills on all aspects. Slopes range from 2 to over 30 percent, but slope gradients of 4 to 15 percent are most typical. Elevations are 5900 to 8000 feet.

**Table 2. Representative physiographic features**

Landforms	(1) Plateau (2) Ash flow
Elevation	1,800 – 2,440 m
Slope	0 – 30 %
Aspect	Aspect is not a significant factor

### Climatic features

The climate associated with this site is semiarid and characterized by cool, moist winters and warm, dry summers. Average annual precipitation is 12 to 14 inches. Mean annual air temperature is 42 to 46 degrees F. The average growing season is about 70 to 90 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 precipitation 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)	80 days
Freeze-free period (average)	
Precipitation total (average)	330 mm

### Influencing water features

There are no influencing water features associated with this site.

### Soil features

The soils associated with this site are moderately deep to deep and well drained. Surface soils are moderately coarse to medium textured and more than ten inches thick to the subsoil or underlying material. There are high amounts of vitric volcanic ash and glass throughout the soil profile. Available water holding capacity is very low to moderate. Infiltration of water is rapid due to the relatively coarse textured surface soils. Permeability is slow to moderately slow and runoff is high to very high. The soil series associated with this site include: Ashtre and Devoy.

**Table 4. Representative soil features**

Surface texture	(1) Very gravelly loam (2) Gravelly loam (3) Ashy clay loam
Family particle size	(1) Loamy
Drainage class	Well drained
Permeability class	Slow to moderately slow
Soil depth	50 – 100 cm
Surface fragment cover <=3"	10 – 40 %
Surface fragment cover >3"	0 – 20 %

Available water capacity (0-101.6cm)	8.13 – 13.97 cm
Calcium carbonate equivalent (0-101.6cm)	Not specified
Electrical conductivity (0-101.6cm)	Not specified
Sodium adsorption ratio (0-101.6cm)	Not specified
Soil reaction (1:1 water) (0-101.6cm)	6.1 – 7.8
Subsurface fragment volume ≤3" (Depth not specified)	10 – 40 %
Subsurface fragment volume >3" (Depth not specified)	0 – 20 %

### Ecological dynamics

Where management results in abusive grazing use by livestock and/or feral horses, woody plants, bottlebrush squirreltail, and Sandberg bluegrass increase as Idaho fescue, needlegrass and other desirable forage grasses decrease. Thistle and cheatgrass are species likely to invade this site. Where this site occurs adjacent to juniper woodland communities these trees readily invade the 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. 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. Western needlegrass is moderately damaged by fire. The recovery time is between 3 and 5 years. Thurber's needlegrass is classified as moderately resistant, but depending on season of burn, phenology, and fire severity, this perennial bunchgrass is moderately to severely damaged by fire. Early season burning is more damaging to this needlegrass than late season burning. Burning bluebunch wheatgrass may remove most of the aboveground biomass but does not usually result in plant mortality. Bluebunch wheatgrass is generally favored by burning. Burning stimulates flowering and seed production. However, season of burning affects mortality. Canby's bluegrass is generally unharmed by fire. It produces little litter, and its small bunch size and sparse litter reduces the amount of heat transferred to perennating buds in the soil. Its rapid maturation in the spring also reduces fire damage, since it is dormant when most fires occur. Cusick's bluegrass is unharmed to slightly harmed by light-severity fall fires. Cusick's bluegrass regenerates after fire from seed and by tillering.

### 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 (%)
<b>Grass/Grasslike</b>					
1	<b>Primary Perennial Grasses</b>			549-908	
	Idaho fescue	FEID	<i>Festuca idahoensis</i>	448-560	–
	bluebunch wheatgrass	PSSPS	<i>Pseudoroegneria spicata</i> ssp. <i>spicata</i>	22-90	–
	western needlegrass	ACOCO	<i>Achnatherum occidentale</i> ssp. <i>occidentale</i>	28-84	–
	Thurber's needlegrass	ACTH7	<i>Achnatherum thurberianum</i>	28-84	–
	Cusick's bluegrass	POCUE2	<i>Poa cusickii</i> ssp. <i>epilis</i>	11-45	–
2	<b>Secondary Perennial Grasses/Grasslikes</b>			22-90	
	threadleaf sedge	CAFI	<i>Carex filifolia</i>	6-34	–
	squirreltail	ELEL5	<i>Elymus elymoides</i>	6-34	–
	blue wildrye	ELGL	<i>Elymus glaucus</i>	6-34	–
	prairie Junegrass	KOMA	<i>Koeleria macrantha</i>	6-34	–
	basin wildrye	LECI4	<i>Leymus cinereus</i>	6-34	–
<b>Forb</b>					
3	<b>Perennial</b>			56-168	
	tapertip hawksbeard	CRAC2	<i>Crepis acuminata</i>	6-34	–
	lupine	LUPIN	<i>Lupinus</i>	6-34	–
<b>Shrub/Vine</b>					
4	<b>Primary Shrubs</b>			112-224	
	mountain big sagebrush	ARTRV	<i>Artemisia tridentata</i> ssp. <i>vaseyana</i>	112-224	–
5	<b>Secondary Shrubs</b>			22-90	
	yellow rabbitbrush	CHVI8	<i>Chrysothamnus viscidiflorus</i>	11-34	–
	antelope bitterbrush	PUTR2	<i>Purshia tridentata</i>	11-34	–
<b>Tree</b>					
6	<b>Evergreen</b>			6-22	
	western juniper	JUOC	<i>Juniperus occidentalis</i>	6-22	–

## Animal community

Livestock Interpretations: This site is suitable for livestock grazing. Grazing management should be keyed to perennial grass production. 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. Western needlegrass has a spreading and deeply penetrating root system, which makes it resistant to trampling. Thurber's needlegrass species begin growth early in the year and remain green throughout a relatively long growing season. This pattern of development enables animals to use Thurber's needlegrass when many other grasses are unavailable. Cattle prefer Thurber's needlegrass in early spring before fruits have developed as it becomes less palatable when mature. Thurber's needlegrasses are grazed in the fall only if the fruits are softened by rain. Bluebunch wheatgrass is considered one of the most important forage grass species on western rangelands for livestock. Although bluebunch wheatgrass can be a crucial source of forage, it is not necessarily the most highly preferred species. Canby's bluegrass is a widespread forage grass. It is one of the earliest grasses in the spring and is sought by domestic livestock and several wildlife species. Canby's bluegrass is a palatable species, but its production is closely tied to weather conditions. It produces little forage in drought years, making it a less dependable food source than other perennial bunchgrasses. Cusick's bluegrass makes up only a small proportion of the biomass of the sagebrush communities in which it lives, but it is often taken preferentially by cattle, especially early in the season. 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. 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. 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. Western needlegrass

provides valuable forage for many species of wildlife. Thurber needlegrass is valuable forage for wildlife. Bluebunch wheatgrass is considered one of the most important forage grass species on western rangelands for wildlife. Bluebunch wheatgrass does not generally provide sufficient cover for ungulates, however, mule deer are frequently found in bluebunch-dominated grasslands. Canby's bluegrass is desirable for pronghorn antelope and mule deer in the spring and preferable in the spring, summer, and fall for elk and desirable as part of their winter range. Deer, elk, and mountain goat also use Cusick's bluegrass early in the season. The value of Cusick's bluegrass as cover for small animals has been rated as poor to fair.

### Hydrological functions

Runoff is high to very high. Permeability is slow to moderately slow. Hydrologic soil group is C. There are typically no rills. There may be a few, widely spaced and shallow, rills on steeper slopes (over 30% gradient). Water flow patterns and pedestals are typically non-existent but water flow patterns can rarely occur on steeper slopes in areas recently subjected to intense summer convection storms or rapid snowmelt. Frost heaving of shallow rooted plants should not be considered a "normal" condition. Gullies are non-existent in areas of this site that occur on stable landforms. Perennial herbaceous plants (especially deep-rooted bunchgrasses [i.e., Idaho fescue]) slow runoff and increase infiltration. Shrub canopy and associated litter break raindrop impact and provide opportunity for snow catch and accumulation on site.

### 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.

### Type locality

Location 1: Washoe County, NV	
Township/Range/Section	T43N R20E S3
UTM zone	N
UTM northing	273134
UTM easting	4617481
Latitude	41° 40' 36"
Longitude	119° 43' 31"
General legal description	SE 1/3 NW 1/4, Little Basin area, west side of Long Valley, Washoe County, Nevada. This site also occurs in Humboldt County, Nevada.

### Other references

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

## Contributors

GKB

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)	P NOVAK-ECHENIQUE
Contact for lead author	State Rangeland Management Specialist
Date	07/04/2014
Approved by	
Approval date	
Composition (Indicators 10 and 12) based on	Annual Production

## Indicators

**1. Number and extent of rills:** Rills are none to rare. There may be a few, widely spaced and shallow, rills on steeper slopes (over 30% gradient).

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**2. Presence of water flow patterns:** Water flow patterns are typically non-existent but can rarely occur on steeper slopes in areas recently subjected to intense summer convection storms or rapid snowmelt. Patterns are short (<1 m) and stable.

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**3. Number and height of erosional pedestals or terracettes:** Pedestals are typically non-existent.

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**4. Bare ground from Ecological Site Description or other studies (rock, litter, lichen, moss, plant canopy are not bare ground):**  
Bare ground  $\pm$  30%; surface rock fragments  $\pm$  35%

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5. **Number of gullies and erosion associated with gullies:** Gullies are non-existent in areas of this site that occur on stable landforms.

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6. **Extent of wind scoured, blowouts and/or depositional areas:** None

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7. **Amount of litter movement (describe size and distance expected to travel):** Fine litter (foliage from grasses and annual & perennial forbs) expected to move distance of slope length during intense summer convection storms or rapid snowmelt events. Persistent litter (large woody material) will remain in place except during large rainfall events.

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8. **Soil surface (top few mm) resistance to erosion (stability values are averages - most sites will show a range of values):** Soil stability values should be 3 to 6 on most soil textures found on this site.

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9. **Soil surface structure and SOM content (include type of structure and A-horizon color and thickness):** Surface structure is typically moderate thin platy. Soil surface colors are dark browns and soils are typified by a mollic epipedon. Organic matter of the surface 2 to 4 inches is typically 1.50 to 3 percent, dropping off quickly below. Organic matter content can be more or less depending on micro-topography.

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10. **Effect of community phase composition (relative proportion of different functional groups) and spatial distribution on infiltration and runoff:** Perennial herbaceous plants (especially deep-rooted bunchgrasses [i.e., Idaho fescue]) slow runoff and increase infiltration. Shrub canopy and associated litter break raindrop impact and provide opportunity for snow catch and accumulation on site.

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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):** Compacted layers are none. Subangular blocky structure or subsoil argillic horizons are not to be interpreted as compacted layers.

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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:** Deep-rooted, cool season, perennial bunchgrasses (Idaho fescue)

**Sub-dominant:** tall shrubs (mountain big sagebrush) > deep-rooted, cool season, perennial forbs > associated shrubs > fibrous, shallow-rooted, cool season, perennial and annual forbs = shallow-rooted, cool season, perennial grasses

**Other:**

**Additional:**

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13. **Amount of plant mortality and decadence (include which functional groups are expected to show mortality or decadence):** Dead branches within individual shrubs common and standing dead shrub canopy material may be as much as 25% of total woody canopy; some of the mature bunchgrasses (<10%) have dead centers.

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14. **Average percent litter cover (%) and depth ( in):** Between plant interspaces (20-30%) and litter depth is <1/4 inch.

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15. **Expected annual annual-production (this is TOTAL above-ground annual-production, not just forage annual-production):**  
For normal or average growing season (through June)  $\pm$  1000 lbs/ac; Favorable: + 1400 lbs/ac; Unfavorable: + 700 lbs/ac

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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: Potential invaders include cheatgrass and annual mustards. Western juniper will increase and eventually dominate this site.

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17. **Perennial plant reproductive capability:** All functional groups should reproduce in average (or normal) and above average growing season years. Reduced growth and reproduction occur during drought years.

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