

Ecological site R023XY042NV GRANITIC SOUTH SLOPE 12-14 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.

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 has a similar plant community to the modal site but is significantly less productive with only 800 lbs/ac in normal years. The soils of this site have formed in residuum and colluvium derived from granitic rock sources. The soils are well drained, runoff is medium to very rapid, and permeability is moderately slow. This site does not have a tree state but can have an eroded state that might occur if thunderstorms occur after a fire (T3C). Bare ground will be significant with flow paths and soil redistribution visible on the landscape. This site has five stable states, however it has an eroded state but does not have a tree state.

Associated sites

R023XY043NV	GRANITIC SLOPE 14-16 P.Z.
R023XY048NV	GRANITIC SLOPE 16+ P.Z.
R023XY049NV	GRANITIC SOUTH SLOPE 8-12 P.Z.
R023XY050NV	STONY GRANITIC SLOPE 14+ P.Z.
R023XY058NV	GRANITIC LOAM 14-16 P.Z.
R023XY068NV	GRANITIC LOAM 8-10 P.Z.

Similar sites

R023XY049NV	GRANITIC SOUTH SLOPE 8-12 P.Z. lower elevations; less productive site
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R023XY016NV	SOUTH SLOPE 12-16 P.Z. Higher elevations; more productive site
R023XY020NV	LOAMY 10-12 P.Z. ACTH7-PSSPS codominant; lower elevations
R023XY041NV	LOAMY 12-14 P.Z. LECI4 major species; more productive site
R023XY039NV	LOAMY SLOPE 10-14 P.Z. ARTRW8 typically dominant shrub; soils not from granitic parent material

Table 1. Dominant plant species

Tree	Not specified
Shrub	(1) <i>Artemisia tridentata var. vaseyana</i>
Herbaceous	(1) <i>Pseudoroegneria spicata ssp. spicata</i>

Physiographic features

This site occurs on mountain backslopes of dominately southerly aspect. Slopes range from 15 to 75 percent, but slope gradients of 30 to 50 percent are most typical. Elevations are 5000 to 8100 feet.

Table 2. Representative physiographic features

Landforms	(1) Mountain slope
Elevation	1,520 – 2,470 m
Slope	20 – 80 %
Aspect	S

Climatic features

The climate associated with this site is semiarid and characterized by cold, moist winters and warm, dry summers. Average annual precipitation is 12 to 14 inches. Mean annual air temperature is 41 to 43 degrees F. The average growing season is about 80 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 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)	90 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 have formed in residuum and colluvium derived from granitic rock sources. They are shallow and very shallow. Soil textures range from coarse or moderately coarse at the surface to moderately fine in the subsoil. These soils have a very low available water capacity. Soil reaction ranges from slightly acid at the surface to neutral in the subsoil. The soils are well drained, runoff is very high, and permeability is moderately slow to rapid. The soil series associated with this site include: Selbit and Siscab.

Table 4. Representative soil features

Surface texture	(1) Very gravelly coarse sand (2) Very bouldery loamy coarse sand (3) Bouldery sandy loam
Family particle size	(1) Clayey

Drainage class	Well drained to somewhat excessively drained
Permeability class	Moderately slow to rapid
Soil depth	20 – 50 cm
Surface fragment cover <=3"	20 – 30 %
Surface fragment cover >3"	0 – 10 %
Available water capacity (0-101.6cm)	2.03 – 4.32 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)	20 %
Subsurface fragment volume >3" (Depth not specified)	0 – 30 %

Ecological dynamics

Where management results in abusive use by livestock and feral horses, bluebunch wheatgrass and Thurber's needlegrass decrease. Mountain big sagebrush, snowberry, and rabbitbrush species increase in the overstory. Cheatgrass and thistle are plants 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. Antelope bitterbrush is considered a weak sprouter and is often killed by summer or fall fire. Antelope bitterbrush in some areas may sprout after light-severity spring fire. High fuel consumptions increase antelope bitterbrush mortality and therefore favors seedling establishment. 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. 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.

State and transition model

Additional community tables

Table 5. Community 1.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production ()	Foliar Cover (%)
Grass/Grasslike					
1	Primary Perennial Grasses			493-628	
	bluebunch wheatgrass	PSSPS	<i>Pseudoroegneria spicata ssp. spicata</i>	448-538	–
	Thurber's needlegrass	ACTH7	<i>Achnatherum thurberianum</i>	45-90	–
2	Secondary Perennial Grasses			45-90	
	squirreltail	ELEL5	<i>Elymus elymoides</i>	4-27	–
	basin wildrye	LECI4	<i>Leymus cinereus</i>	4-27	–
	bluegrass	POA	<i>Poa</i>	4-27	–
Forb					
3	Perennial			36-81	
	arrowleaf balsamroot	BASA3	<i>Balsamorhiza sagittata</i>	9-18	–
	tapertip hawksbeard	CRAC2	<i>Crepis acuminata</i>	9-18	–
	buckwheat	ERIOG	<i>Eriogonum</i>	4-18	–
	lupine	LUPIN	<i>Lupinus</i>	4-18	–
	phlox	PHLOX	<i>Phlox</i>	4-18	–
Shrub/Vine					
4	Primary Shrubs			179-314	
	mountain big sagebrush	ARTRV	<i>Artemisia tridentata ssp. vaseyana</i>	135-224	–
	antelope bitterbrush	PUTR2	<i>Purshia tridentata</i>	45-90	–
5	Secondary Shrubs			45-90	
	Utah serviceberry	AMUT	<i>Amelanchier utahensis</i>	9-27	–
	yellow rabbitbrush	CHV18	<i>Chrysothamnus viscidiflorus</i>	9-27	–
	littleleaf horsebrush	TEGL	<i>Tetradymia glabrata</i>	9-27	–

Animal community

Livestock Interpretations: This site is suitable for livestock grazing. Grazing management should be keyed to perennial grass production. 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. 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. 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. Antelope bitterbrush is important browse for livestock. Domestic livestock and mule deer may compete for antelope bitterbrush in late summer, fall, and/or winter. Cattle prefer antelope bitterbrush from mid-May through June and again in September and October. 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. Pronghorn antelope, mule deer, elk, and bighorn sheep utilize antelope bitterbrush extensively. Mule deer use of antelope bitterbrush peaks in September, when antelope bitterbrush may compose 91 percent of the diet. Winter use is greatest during periods of deep snow. Antelope bitterbrush seed is a large part of the diets of rodents, especially deer mice and kangaroo rats. 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. Thurber needlegrass is valuable forage for wildlife.

Hydrological functions

Runoff is very high. Permeability is moderately slow to rapid. Hydrologic soil group is B and D.

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 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.

Other information

Antelope bitterbrush has been used extensively in land reclamation. Antelope bitterbrush enhances succession by retaining soil and depositing organic material and in some habitats and with some ecotypes, by fixing nitrogen.

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

CP/SW

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
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Date	07/12/2012

Approved by	
Approval date	
Composition (Indicators 10 and 12) based on	Annual Production

Indicators

1. **Number and extent of rills:** Rills are typically none to rare. Some rills can be expected on steeper slopes (>30%) in areas recently subjected to summer convection storms or rapid snowmelt.

2. **Presence of water flow patterns:** Water flow patterns are rare but can be expected on steeper slopes in areas recently subjected to summer convection storms or rapid snowmelt.

3. **Number and height of erosional pedestals or terracettes:** Pedestals are rare. Occurrence is usually limited to areas of water flow patterns. Frost heaving of shallow rooted plants should not be considered a "normal" condition.

4. **Bare ground from Ecological Site Description or other studies (rock, litter, lichen, moss, plant canopy are not bare ground):**
Bare Ground \pm 15-25% depending on amount of surface rock fragments

5. **Number of gullies and erosion associated with gullies:** None

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

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.

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. (To be field tested.)

9. **Soil surface structure and SOM content (include type of structure and A-horizon color and thickness):** Surface structure is typically medium platy or subangular blocky. Soil surface colors are dark and soils are typified by a mollic epipedon. Organic matter of the surface 2 to 4 inches is typically 1.25 to 3 percent dropping off quickly below. Organic matter content can be more or less depending on micro-topography.

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., bluebunch wheatgrass] 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. Subsoil argillic horizons are not to be interpreted as compacted.
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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>>tall shrubs (big sagebrush & antelope bitterbrush)
- Sub-dominant: associated shrubs>shallow-rooted, cool season, perennial grasses>deep-rooted, cool season, perennial forbs>fibrous, shallow-rooted, cool season, perennial and annual forbs.
- Other:
- Additional:
-
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 (<15%) have dead centers.
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14. **Average percent litter cover (%) and depth (in):** Between plant interspaces (30-40%) and litter depth is $\pm 1/4$ 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 mid-June) ± 800 lbs/ac; Favorable years 1000 lbs/ac and unfavorable years 600 lbs/ac. Spring moisture significantly affects total 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: Potential invaders include cheatgrass, Russian thistle, annual mustards, and Utah juniper.**
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17. **Perennial plant reproductive capability:** All functional groups should reproduce in average (or normal) and above average growing season years
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