

Ecological site R030XC029NV

SNOWPOCKET

Last updated: 2/25/2025

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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

This site occurs on shoulders of mountain slopes where snowdrifts are formed, often as a result of snow blown off exposed mountain ridges windward from this site. These snowdrifts are the last patches of snow to melt, usually in the late spring or early summer. Slopes range from 15 to 75 percent. Elevations range from 8,000 to 11,000 feet. The soils associated with this site are shallow to moderately deep and are well drained. The available water holding capacity is moderate. Heavy snow accumulation on this site often persists into the summer when the soil is not frozen, but soil temperatures remain cold. Please refer to group concept R030XC028NV to view the provisional STM.

Associated sites

F030XC289NV	<i>Pinus flexilis</i>-<i>Pinus longaeva</i>/<i>Ribes cereum</i>-<i>Juniperus communis</i> var. <i>depressa</i> This site is adjacent.
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Table 1. Dominant plant species

Tree	Not specified
Shrub	Not specified
Herbaceous	(1) <i>Achnatherum lettermanii</i> (2) <i>Bromus ciliatus</i>

Physiographic features

This site occurs on shoulders of mountain slopes where snowdrifts are formed, often as a result of snow blown off exposed mountain ridges windward from this site. These snowdrifts are the last patches of snow to melt, usually in the late spring or early summer. Slopes range from 15 to 75 percent. Elevations range from 8,000 to 11,000 feet.

Table 2. Representative physiographic features

Landforms	(1) Mountain slope (2) Ridge
Elevation	2,440 – 3,510 m

Slope	20 – 80 %
Aspect	Aspect is not a significant factor

Climatic features

The primary air masses affecting the Spring Mountains are cold maritime polar air from the Gulf of Alaska and warmer, moist maritime subtropical air from lower latitudes. Occasionally there are invasions of cold continental polar air from northern Canada or the Rocky Mountains. Precipitation in the area results primarily from the passage of cyclones with associated fronts during fall, winter and spring; from closed cyclones in late winter and spring; and from the flow of moist tropical air from the southeast to the southwest quadrant in the summer.

The mean annual precipitation is about 20 to 24 inches and mean annual air temperature is 38 to 43 degrees F., and the frost-free season is 50 to 90 days. There are no climate stations available for this site.

Table 3 Representative climatic features

Frost-free period (average)	90 days
Freeze-free period (average)	
Precipitation total (average)	610 mm

Influencing water features

This site receives runoff from snow melt.

Soil features

The soils associated with this site are shallow to moderately deep and are well drained. The available water holding capacity is moderate. Heavy snow accumulation on this site often persists into the summer when the soil is not frozen, but soil temperatures remain cold. Snow melting slowly adds to the soil moisture supply, and is available to plants during the growing season. Runoff from this site is high to very high, and permeability is moderate. The soil temperature regime is frigid and the soil moisture regime is udic.

Table 4. Representative soil features

Surface texture	(1) Extremely gravelly loam
Family particle size	(1) Loamy
Drainage class	Well drained
Permeability class	Moderate
Soil depth	50 – 100 cm
Surface fragment cover <=3"	70 – 80 %

Surface fragment cover >3"	10 – 20 %
Available water capacity (0-101.6cm)	2.29 – 2.54 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)	7.4 – 8.4
Subsurface fragment volume <=3" (Depth not specified)	40 – 60 %
Subsurface fragment volume >3" (Depth not specified)	10 – 50 %

Ecological dynamics

Please refer to group concept R030XC028NV to view the provisional STM.

Impacts from human developments, pollution and disturbance to natural processes have been relatively low in the alpine ecosystems compared to other ecosystems. However, alpine ecosystems are sensitive to disturbance and the consequences are more drastic and long-lasting. These systems are subject to high winds, prolonged snow cover, extremes of heat and cold and intense ultraviolet radiation. Steep local gradients in snow cover, soil moisture govern the productivity and distribution of alpine plants. Plant community composition also varies with changes in aspect and soil depth. Encroachment by trees occurs during low snowpack years.

Cheatgrass has spread to high elevations in the western U.S. over the last 10 to 15 years. This range expansion may be due to 1) local adaptation, 2) phenotypic plasticity of all-purpose genotypes, 3) changes in climate, 4) increased local disturbance, 5) nutrient enrichment, 6) seed dispersal, or some combination of one or more of these mechanisms. Cheatgrass may invade this site.

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			224-448	

	Letterman's needlegrass	ACLE9	<i>Achnatherum lettermanii</i>	84-168	–
	fringed brome	BRCI2	<i>Bromus ciliatus</i>	84-168	–
	slender wheatgrass	ELTR7	<i>Elymus trachycaulus</i>	56-112	–
2	Secondary Perennial Grasses			1-28	
	Ross' sedge	CARO5	<i>Carex rossii</i>	3-11	–
	squirreltail	ELEL5	<i>Elymus elymoides</i>	3-11	–
	alpine fescue	FEBR	<i>Festuca brachyphylla</i>	3-11	–
	needle and thread	HECO26	<i>Hesperostipa comata</i>	3-11	–
Forb					
3	Primary Perennial Forbs			11-28	
	yellow bush lupine	LUAR	<i>Lupinus arboreus</i>	11-28	–
4	Secondary Perennial Forbs			11-45	
	tarragon	ARDR4	<i>Artemisia dracunculus</i>	3-11	–
	rabbit ear rockcress	ARPEP	<i>Arabis pendulina</i> var. <i>pendulina</i>	3-11	–
	Clokey's fleabane	ERCL	<i>Erigeron clokeyi</i>	3-11	–
	Lemmon's rubberweed	HYLE	<i>Hymenoxys lemmonii</i>	3-11	–
	mountain oxytrope	OXOR2	<i>Oxytropis oreophila</i>	3-11	–
	Keck's beardtongue	PELEK	<i>Penstemon leiophyllus</i> var. <i>keckii</i>	3-11	–
	elegant cinquefoil	POCO13	<i>Potentilla concinna</i>	3-11	–
	Johnston's knotweed	PODOJ2	<i>Polygonum douglasii</i> ssp. <i>johnstonii</i>	3-11	–
Shrub/Vine					
5	Primary Shrubs			39-84	
	gooseberry currant	RIMO2	<i>Ribes montigenum</i>	28-56	–
	Charleston Mountain goldenbush	ERCO40	<i>Ericameria compacta</i>	11-28	–
Tree					
6	Trees			1-11	
	Great Basin bristlecone pine	PILO	<i>Pinus longaeva</i>	1-11	–

Animal community

Livestock Interpretations: This site has low value for livestock grazing due to lack of stock water. Grazing management should be keyed to perennial grasses or palatable shrubs 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. Fringed brome is a good source of forage on western forest ranges. Fringed brome is browsed by livestock and is considered one of the best range grasses. Slender wheatgrass is grazed by all classes of livestock. Gooseberry currant is not very palatable to livestock. Charleston Mountain goldenbrush may be a source of browse for livestock, particularly in the late fall and early winter after more palatable species have been depleted. 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:** Bighorn sheep and mule deer may utilize this site during the spring and summer. Various songbirds, rodents, and associated predators native to the area may be found. 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. Fringed brome is a good source of forage on western forest ranges. Fringed brome is an important forage species for deer throughout the summer months. Slender wheatgrass is grazed by sage grouse, deer, elk, moose, and bighorn sheep, mountain goat, pronghorn, various rodents, and all classes of livestock. The seeds are eaten by various seed predators. Slender wheatgrass provides hiding and thermal cover for songbirds, upland game birds, waterfowl, and small mammals. The fruit of *Ribes* spp. is a valuable food source for songbirds, chipmunks, ground squirrels, and other animals. Charleston Mountain goldenbrush may be a source of browse for wildlife, particularly in the late fall and early winter after more palatable species have been depleted.

Hydrological functions

Rills – Occasional on steeper slopes. Water flow Patterns – Common on steeper slopes. Pedestals and/or Terracettes – Occasional terracettes on steeper slopes. Gullies – None

Recreational uses

This site is used primarily for recreational activities, such as hiking and bird watching.

Other information

There are 2 plant species of concern associated with this ecological site within the Spring Mountain National Recreational Area (SMNRA). Both species are endemic to the SMNRA. There is one butterfly species of concern which is endemic to the SMNRA.

Type locality

Location 1: Clark County, NV	
Township/Range/Section	T20S R56E S1
UTM zone	N
UTM northing	4010942
UTM easting	621160
General legal description	Approximately 1/8 mile south east from intersection of the South Loop trail and Harris Spring trail, Spring Mountains, Clark County, Nevada.

Other references

Brown, C.S. (no date). The unwelcome arrival of *Bromus tectorum* to high elevations. Available [Online]: <http://lamar.colostate.edu>. Colorado State University, Fort Collins, CO.

Clokey, I. 1951. Flora of the Charleston Mountains, Clark County, Nevada. University of California Press, Berkeley and Los Angeles.

Fire Effects Information System [Online] <http://www.fs.fed.us/feis>.

Glenne, G. and D. Johnson. 2002. Guide to Species of Concern in the Spring Mountains National Recreation Area, Clark and Nye Counties, Nevada. USFS, Las Vegas, NV

Contributors

TJW

Approval

Sarah Quistberg, 2/25/2025

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)	TJ Wolfe
Contact for lead author	State Rangeland Management Specialist
Date	09/12/2005
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. Rock fragments armor the surface.

2. **Presence of water flow patterns:** Water flow patterns are none to rare. A few may occur after summer convection storms, usually in the interspaces between shrubs.

3. **Number and height of erosional pedestals or terracettes:** Pedestals are none to rare.

4. **Bare ground from Ecological Site Description or other studies (rock, litter, lichen, moss, plant canopy are not bare ground):** Typically less than 10%.

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 catastrophic 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 moderately very thick platy. Soil surface colors are light and soils are typified by an ochric epipedon. Organic matter of the surface 0 to 2 inches is <1 percent.
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10. **Effect of community phase composition (relative proportion of different functional groups) and spatial distribution on infiltration and runoff:** Dense shrub canopy and associated litter break raindrop impact and allow for snow capture on this site. Deep-rooted perennial grasses increase infiltration and control 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):** None. Massive subsurface horizons should not be mistaken for compaction.
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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: evergreen tall shrubs (littleleaf mountain mahogany)
- Sub-dominant: associated shrubs > deep-rooted, cool-season, perennial grasses > perennial forbs > rhizomatous warm-season, grasses > shallow-rooted, cool-season perennial grasses > annual forbs
- Other: evergreen trees
- 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; mature bunchgrasses commonly ($\pm 25\%$) have dead centers.
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14. **Average percent litter cover (%) and depth (in):** Under canopy and between plant interspaces (25-35%) and depth ($\pm \frac{1}{4}$ -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 ± 500 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 on this site include cheatgrass.**
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17. **Perennial plant reproductive capability:** All functional groups should reproduce in above average growing season years. Less reproduction will occur in below-average precipitation years.
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