USDA Natural Resources
Conservation Service

Ecological site R030XC026NV
AVALANCHE CHUTE

Last updated: 2/25/2025
Accessed: 05/11/2025

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 concave mountain slopes. Slopes typically range from 30 to 90 percent slope. Elevations range from 8,000 feet to 11,150 feet. The soils associated with this site are deep to very deep. The soils have developed from avalanche deposits. The soil profile is modified with high amounts of rock fragments.

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

Associated sites

F030XC282NV	**Abies concolor var. concolor/Ribes cereum**
F030XC289NV	**Pinus flexilis-Pinus longaeva/Ribes cereum-Juniperus communis var. depressa**
R030XC019NV	**ASPEN THICKET**

Similar sites

R030XC019NV	**ASPEN THICKET** Aspen dominated site, more stable plant community.

Table 1. Dominant plant species

Tree	(1) *Populus tremuloides*
Shrub	(1) *Ribes cereum*
Herbaceous	(1) *Bromus ciliatus*

Physiographic features

This site occurs on concave mountain slopes. Slopes typically range from 30 to 90 percent slope. Elevations range from 8,000 feet to 11,150 feet.

Table 2. Representative physiographic features

Landforms	(1) Avalanche chute
Elevation	8,000–11,150 ft
Slope	30–90%
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 18 to 24 inches and mean annual air temperature is 40 to 45 degrees F., and the frost-free season is 50 to 90 days.

Snow Course, Spring Mountains, Nevada. Average snow depth and snow water equivalent from 1971 to 2000 at March 1 and April 1 of each year.

Kyle Canyon. (Elevation 8200 feet.) March 1: 36 inch snow depth, 10.9 inches of water equivalent. April: 31 inch snow depth, 11.7 inches of water equivalent.

Rainbow Canyon #2 (Elevation 8100 feet) March 1: 44 inch snow depth, 13.8 inches of water equivalent. April 1: 46 inch snow depth, 16.7 inches of water equivalent.

Lee Canyon #2. (Elevation 9000 feet) March 1: 35 inch snow depth, 10.6 inches of water equivalent. April 1: 31 inch snow depth, 11.1 inches of water equivalent.

Lee Canyon #3. (Elevation 8500 feet) March 1: 28 inch snow depth, 8.5 inches of water equivalent. April 1: 24 inch snow depth, 9.1 inches of water equivalent.

Table 3. Representative climatic features

Frost-free period (average)	90 days
Freeze-free period (average)	
Precipitation total (average)	24 in

Influencing water features

This site will received additional moisture from snowmelt through the spring months.

Soil features

The soils associated with this site are deep to very deep. The soils have developed from avalanche deposits. The soil profile is modified with high amounts of rock fragments. The soils are usually moist in late winter and spring, and periodically moist in the upper profile following summer thunderstorms.

Table 4. Representative soil features

Surface texture	(1) Very gravelly fine sandy loam
Family particle size	(1) Loamy
Drainage class	Well drained
Permeability class	Moderately rapid
Soil depth	47–72 in
Surface fragment cover <=3"	25–45%
Surface fragment cover >3"	1–10%
Calcium carbonate equivalent (0-40in)	35–38%

Electrical conductivity (0-40in)	0 mmhos/cm
Sodium adsorption ratio (0-40in)	0
Soil reaction (1:1 water) (0-40in)	6.6–8.4
Subsurface fragment volume <=3" (Depth not specified)	35–50%
Subsurface fragment volume >3" (Depth not specified)	5–10%

Ecological dynamics

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

This plant community is unstable, but it is usually dominated by small quaking aspen trees, dwarf juniper and currant. This site is frequently disturbed by intense, natural snow and debris avalanches. Quaking aspen is the dominant tree as the plant community begins to stabilize following major disturbance.

Ratings of ecological condition and determinations of similarity index are not applicable to this site due the inherent instability of the plant community.

State and transition model

Ecosystem states

1. Reference Plant Community

State 1 submodel, plant communities

1.1. Reference Plant Community

State 1
Reference Plant Community

Community 1.1
Reference Plant Community

The reference plant community varies based on the time since the last natural disturbance. Potential vegetative composition is about 10 percent grasses, 10 percent forbs and 80 percent shrubs and trees. Approximate ground cover is 25 to 40 percent. Total for all trees, shrubs and herbaceous plants, irrespective of height is 1500 pounds on favorable years, 1000 pounds on normal years and 500 pounds on unfavorable years.

Table 5. Annual production by plant type

Plant Type	Low (Lb/Acre)	Representative Value (Lb/Acre)	High (Lb/Acre)
Tree	300	600	900
Shrub/Vine	100	200	300
Forb	50	100	150
Grass/Grasslike	50	100	150
Total	**500**	**1000**	**1500**

Table 6. Ground cover

Tree foliar cover	1-5%
Shrub/vine/liana foliar cover	20-25%
Grass/grasslike foliar cover	1-5%
Forb foliar cover	1-5%
Non-vascular plants	0%
Biological crusts	0%
Litter	20-40%
Surface fragments >0.25" and <=3"	25-45%
Surface fragments >3"	1-10%
Bedrock	1-50%
Water	0%
Bare ground	1-5%

Table 7. Canopy structure (% cover)

Height Above Ground (Ft)	Tree	Shrub/Vine	Grass/ Grasslike	Forb
<0.5	5-10%	1-5%	1-5%	1-5%
>0.5 <= 1	5-10%	1-10%	1-5%	1-5%
>1 <= 2	5-10%	1-10%	1-5%	1-5%
>2 <= 4.5	25-30%	1-10%	1-2%	–
>4.5 <= 13	20-25%	–	–	–
>13 <= 40	1-5%	–	–	–
>40 <= 80	–	–	–	–
>80 <= 120	–	–	–	–
>120	–	–	–	–

Additional community tables

Table 8. Community 1.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production (Lb/Acre)	Foliar Cover (%)
Grass/Grasslike					
1	**Primary Perennial Grasses**			40–100	
	fringed brome	BRCI2	*Bromus ciliatus*	20–50	–
	slender wheatgrass	ELTR7	*Elymus trachycaulus*	20–50	–
2	**Secondary Perennial Grasses**			20–50	

	golden sedge	CAAU3	*Carex aurea*	5–20	–
	manyrib sedge	CAMU6	*Carex multicostata*	5–20	–
	Ross' sedge	CARO5	*Carex rossii*	5–20	–
	squirreltail	ELEL5	*Elymus elymoides*	5–20	–
	muttongrass	POFE	*Poa fendleriana*	5–20	–
	bluebunch wheatgrass	PSSPS	*Pseudoroegneria spicata ssp. spicata*	5–20	–
Forb					
3	**Perennial Forbs**			50–100	
	Charleston Mountain angelica	ANSC9	*Angelica scabrida*	5–20	–
	western columbine	AQFO	*Aquilegia formosa*	5–20	–
	Indian paintbrush	CASTI2	*Castilleja*	5–20	–
	whitespine thistle	CICL2	*Cirsium clokeyi*	5–20	–
	brittle bladderfern	CYFR2	*Cystopteris fragilis*	5–20	–
	scented shootingstar	DORE	*Dodecatheon redolens*	5–20	–
	lupine	LUPIN	*Lupinus*	5–20	–
	feathery false lily of the valley	MARA7	*Maianthemum racemosum*	5–20	–
	firecracker penstemon	PEEA	*Penstemon eatonii*	5–20	–
	Keck's beardtongue	PELEK	*Penstemon leiophyllus var. keckii*	5–20	–
	Charleston lousewort	PESEC	*Pedicularis semibarbata var. charlestonensis*	5–20	–
Shrub/Vine					
4	**Primary Shrubs**			80–180	
	wax currant	RICE	*Ribes cereum*	50–100	–
	common juniper	JUCOD	*Juniperus communis var. depressa*	30–80	–
	western columbine	AQFO	*Aquilegia formosa*	50–75	–
	whitespine thistle	CICL2	*Cirsium clokeyi*	30–50	–
	brittle bladderfern	CYFR2	*Cystopteris fragilis*	0–30	–
	lupine	LUPIN	*Lupinus*	0–30	–
	Keck's beardtongue	PELEK	*Penstemon leiophyllus var. keckii*	0–30	–
	Charleston lousewort	PESEC	*Pedicularis semibarbata var. charlestonensis*	0–30	–
	feathery false lily of the valley	MARA7	*Maianthemum racemosum*	5–20	–
	scented shootingstar	DORE	*Dodecatheon redolens*	5–20	–
	Indian paintbrush	CASTI2	*Castilleja*	0–20	–
	Charleston Mountain angelica	ANSC9	*Angelica scabrida*	0–20	–
5	**Secondary Shrubs**			50–100	
	oceanspray	HODI	*Holodiscus discolor*	10–30	–
	gooseberry currant	RIMO2	*Ribes montigenum*	10–30	–
	Woods' rose	ROWO	*Rosa woodsii*	10–30	–
	mountain snowberry	SYOR2	*Symphoricarpos oreophilus*	10–30	–
Tree					
6	**Primary Trees**			201–600	

	quaking aspen	POTR5	*Populus tremuloides*	200–500	–
7	**Secondary Trees**			50–100	
	Rocky Mountain maple	ACGLD3	*Acer glabrum var. diffusum*	5–20	–
	limber pine	PIFL2	*Pinus flexilis*	5–20	–
	Great Basin bristlecone pine	PILO	*Pinus longaeva*	5–20	–
	ponderosa pine	PIPO	*Pinus ponderosa*	5–20	–

Animal community

Livestock Interpretations:
This site has limited value for livestock grazing, due to steep slopes. Grazing management should be keyed to perennial grasses or palatable shrubs production. Most classes of domestic livestock use quaking aspen. Livestock utilization of quaking aspen communities varies with species composition of the understory and relative age of the quaking aspen stand. Young stands generally provide the most browse. Quaking aspen crowns can grow out of reach of large ungulates in 6 to 8 years. Although many animals browse quaking aspen year-round, it is especially valuable during fall and winter, when protein levels are high relative to other browse species. Domestic sheep and cattle browse the leaves and twigs. Domestic sheep browse quaking aspen more heavily than cattle. Heavy livestock browsing can adversely impact quaking aspen growth and regeneration. Stands dominated by white fir seldom produce enough forage for domestic livestock grazing except on harvested or open forest sites, or where grasses and sedges dominate the understory. Because they contain resins, terpenes, and other substances that make the foliage irritating to the digestive tract, most conifers are not particularly palatable to grazing animals. White fir may be slightly palatable to goats. Wax current is fair to poor browse for livestock. Domestic livestock rarely utilize common juniper. The foliage may be poisonous to domestic goats. 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. Fringed brome is an important forage species for livestock, throughout the summer months. Slender wheatgrass is grazed by all classes of livestock.
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:
Quaking aspen is palatable to all browsing wildlife species. Elk browse quaking aspen year-round in much of the West, feeding on bark, branch apices, and sprouts. In some areas, elk use it mainly in winter. Quaking aspen is important forage for mule deer. Deer consume the leaves, buds, twigs, bark, and sprouts. New growth on burns or clearcuts is especially palatable to deer. Deer in many areas use quaking aspen year-round, although in some areas, deer winter below the aspen zone. Quaking aspen provides food for porcupine in winter and spring. Beaver consume the leaves, bark, twigs, and all diameters of quaking aspen branches. They use quaking aspen stems for constructing dams and lodges. Quaking aspen communities provide important feeding and nesting sites for a diverse array of birds. Quaking aspen is host to a variety of insects that are food for woodpeckers and sapsuckers. Many bird species utilize quaking aspen communities of only a particular seral stage. Through most of its range, ruffed grouse depends on quaking aspen for foraging, courting, breeding, and nesting sites. It uses quaking aspen communities of all ages. Favorable ruffed grouse habitat includes quaking aspen stands of at least three different size classes. Young stands provide important brood habitat, and 10- to 25-year-old stands are favored overwintering and breeding areas. Quaking aspen leaves and buds are readily available in abundant quantities in stands greater than 25 years of age, and such older stands are used for foraging. White fir provides abundant browse and cover for large and small wildlife species. Deer, elk, and bear often use white fir habitats as either summer or winter range. Mule deer generally eat small amounts of white fir during the spring, fall, and winter, and sometimes larger amounts during the summer. Mule deer are especially fond of succulent, new white fir growth in the spring. Spring browsing of white fir by deer can be particularly heavy when small white firs are the only green food available; all of the current or previous year's growth may be consumed. White fir needles are an important part of the diet of blue grouse. White fir seeds are eaten by several species of small mammals and birds including grouse, chipmunks, and mice. Wax currant provides food and cover for wildlife. It is only fair to poor browse for deer, but it is important on ranges where little else is available. Wild ungulates generally eat only trace amounts of common juniper. Deer typically browse common juniper during the winter or early spring. Common juniper can be important winter mule deer food. 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.

Hydrological functions

Runoff is very high. Permeability is moderately rapid.

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

White fir is a valuable ornamental tree. It is often used for ornamental plantings in rural and urban landscapes in northern US cities, because it is attractive and frost-hardy. White fir is used extensively in the Christmas tree industry. White fir needles were used to make tea by Native Americans. The fruit of wax currant is used for making jam, jelly, or pie. Some western Indian tribes used currants for making pemmican. Wax currant is cultivated as an ornamental.

Other information

Quaking aspens are used to stabilize soil and watersheds. The trees produce abundant litter that contains more nitrogen, phosphorus, potash and calcium than leaf litter of most other hardwoods. The litter decays rapidly, forming nutrient-rich humus that may amount to 25 tons per acre (oven-dry basis). The humus reduces runoff and aids in percolation and recharge of ground water. Slender wheatgrass is widely used for revegetating disturbed lands. Slender wheatgrass is a short-lived perennial with good seedling vigor. It germinates and establishes quickly when seeded making it a good choice for quick cover on disturbed sites. It persists long enough for other, slower developing species to establish. It is especially valuable for use in saline soils. It has been used for rehabilitating mine spoils, livestock ranges, and wildlife habitat and watershed areas.

Type locality

Location 1: Clark County, NV	
Township/Range/Section	T19 S R56 E S36 SW
General legal description	Canyon above Cathedral Rock Picnic Area, along the south loop trail, Spring Mountains, Clark County, Nevada.

Other references

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.

Lanner, R.M. 1984. Trees of the Great Basin. University of Nevada Press, Reno NV.

Nachlinger, J. and G. Reese. 1996. Plant Community Classification of the Spring mountains National Recreation Area, Clark and Nye Counties, Nevada. The Nature Conservancy. Reno, Nevada.

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)	
Contact for lead author	
Date	05/11/2025
Approved by	Sarah Quistberg
Approval date	
Composition (Indicators 10 and 12) based on	Annual Production

Indicators

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

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

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

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

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

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

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

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:**
