USDA Natural Resources
Conservation Service

Ecological site R029XY169NV
SCREE SLOPE 8-10

Last updated: 2/20/2025
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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.

MLRA notes

Major Land Resource Area (MLRA): 029X–Southern Nevada Basin and Range

The Southern Nevada Basin and Range MLRA (29) represents the transition from the Mojave Desert to the Great Basin. It is cooler and wetter than the Mojave. It is warmer and typically receives more summer precipitation than the Great Basin. This area is in Nevada (73 percent), California (25 percent), and Utah (2 percent). It makes up about 26,295 square miles (68,140 square kilometers). Numerous national forests occur in the area, including the San Bernardino, Angeles, Sequoia, Inyo, Humboldt-Toiyabe, and Dixie National Forests. Portions of Death Valley National Monument, the Nuclear Regulatory Commission's Nevada Test Site, the Hawthorne Ammunition Depot, and the Nellis Air Force Range in Nevada and the China Lake Naval Weapons Center in California also are in this MLRA. The northeast part of the Paiute Indian Reservation and the southern third of the Walker River Indian Reservation are in the part of this MLRA in Nevada, and the Lone Pine, Fort Independence, and Big Pine Indian Reservations are in the part in California.
Physiography:
The entire area is in the Great Basin Section of the Basin and Range Province of the Intermontane Plateaus. The area of broad, nearly level, aggraded desert basins and valleys between a series of mountain ranges trending north to south. The basins are bordered by sloping fans and pluvial lake terraces. The mountains are uplifted fault blocks with steep side slopes and not well dissected due to limited annual precipitation. Most of the valleys in this MLRA are closed basins or bolsons containing sinks or playa lakes.
Geology:
The mountains are dominated by Pliocene and Miocene andesite and basalt rocks, Paleozoic and Precambrian carbonate rocks prominent in some areas. Scattered outcrops of older Tertiary intrusives and very young tuffaceous sediments (Pliocene and Miocene)

are in the western and eastern thirds of this MLRA. The valleys consist mostly of alluvial fill and playa deposits at the lowest elevations in the closed basins.
Climate:
The average annual precipitation is 3 to 12 inches (75 to 305 millimeters) in most of this area. It may be as high as 29 inches (735 millimeters), on the higher mountain slopes. Most of the rainfall occurs as high-intensity, convective thunderstorms during the growing season. Summers are dry, but sporadic storms are common in July and August.
Water Resources:
Water resources are scarce. Ground water and surface water sources are limited. Streams are small and intermittent. Quality of surface water in naturally degraded as streams cross area of valley fill effected by dissolved salts. Irrigation water may raise the levels of dissolved salts and suspended sediments causing contamination.
Soils:
Dominant soil orders include Entisols and Aridisols.

Ecological site concept

The Scree Slope 8-10 site is on mountain backslopes on all exposures. Slopes range from 4 to 75 percent, but slope gradients of 30 to 75 percent are typical. Elevations are 4,200 to about 7,000 feet. Soils are very shallow and well drained. Surface rock fragments greater than 50 percent and consist of angular gravels, cobbles and stones. Because of steep slopes and sparse vegetation, the soils of this site are subject to colluvial movement.

Associated sites

R029XY009NV	**UPLAND WASH** This site is in drainageways on intermountain valley fans and active channels of hills and mountains and on inset fans of upper piedmont slopes. Slopes range from 2 to 15 percent, but slope gradients of 4 to 8 percent are most typical. Elevations are 3,800 to 6,200 feet. Flooding may occur occasionally and is very brief. The soils are deep alluvium from mixed sources. They are quite variable as they continue to be re-worked by water.
R029XY010NV	**LOAMY SLOPE 8-10 P.Z.** This site is on piedmont slopes, rock pediments, hills, and lower mountain sideslopes on all exposures. Slopes range from 4 to 75 percent, but slope gradients of 15 to 50 percent are typical. Elevations are 4,400 to about 8,200 feet. The soils are very shallow to moderately deep and are derived from a variety of parent materials. The surface may be stony, cobbly, or gravelly.
R029XY008NV	**SHALLOW CALCAREOUS LOAM 8-12 P.Z.** This site is on fan remnants, inset fans, and mountains on all exposures. Slopes range from 0 to 75 percent, but slope gradients of 4 to 30 percent are most typical. Elevations are 4,200 to 8,000 feet. The soils associated with this site are very shallow to very deep or they have a restrictive layer within the main rooting depth. These soils are moderately to strongly calcareous and soil reaction increases with soil depth.

Table 1. Dominant plant species

Tree	Not specified
Shrub	(1) *Ephedra viridis* (2) *Artemisia tridentata ssp. wyomingensis*
Herbaceous	(1) *Achnatherum speciosum* (2) *Hesperostipa comata*

Physiographic features

The Scree Slope 8-10 site occurs on mountain backslopes on all exposures. Slopes range from 4 to 75 percent, but slope gradients of 30 to 75 percent are typical. Elevations are 4,200 to about 7,000 feet.

Table 2. Representative physiographic features

Landforms	(1) Mountain
Runoff class	Medium
Elevation	1,280–2,140 m
Slope	4–75%
Water table depth	183 cm
Aspect	Aspect is not a significant factor

Climatic features

The climate is arid, characterized by cool, moist winters and hot, dry summers. Average annual precipitation is 8 to 10 inches. Moisture in the form of intermittent convection storms provides an important source of precipitation from July through September. Mean annual air temperature is 53 to 57 degrees F. The average growing season is about 110 to 150 days. No climate stations are associated with this site.

Table 3. Representative climatic features

Frost-free period (average)	150 days
Freeze-free period (average)	
Precipitation total (average)	254 mm

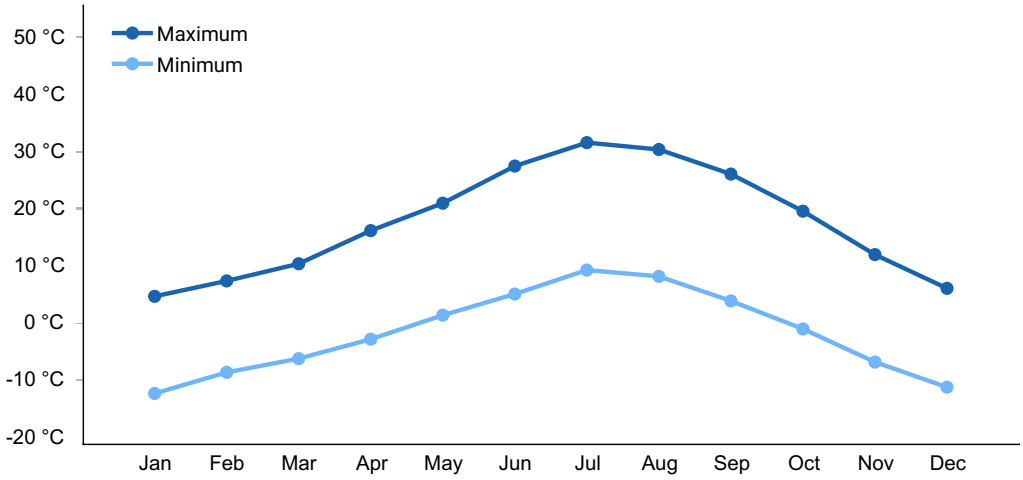


Figure 1. Monthly average minimum and maximum temperature

Influencing water features

There are no influencing water features associated with this site.

Soil features

Soils are very shallow and well drained. Surface rock fragments greater than 50 percent and consist of angular gravels, cobbles and stones. Soils are medium to coarse textured and are modified with high amounts of gravels and cobbles throughout the profile. Because of steep slopes and sparse vegetation, the soils of this site are subject to colluvial movement. The available water capacity is low. Runoff is very high. Soil series associated with this site: Tejabe.

Table 4. Representative soil features

Parent material	(1) Residuum–volcanic rock
Surface texture	(1) Extremely stony sandy loam (2) Very gravelly sandy loam (3) Very stony sandy loam
Drainage class	Well drained
Permeability class	Moderately rapid
Depth to restrictive layer	10–25 cm
Soil depth	10–25 cm
Surface fragment cover <=3"	20–35%
Surface fragment cover >3"	11–30%
Available water capacity (Depth not specified)	1.78–3.56 cm

Calcium carbonate equivalent (Depth not specified)	0%
Electrical conductivity (Depth not specified)	0–2 mmhos/cm
Sodium adsorption ratio (Depth not specified)	0–3
Soil reaction (1:1 water) (Depth not specified)	6.6–7.3
Subsurface fragment volume <=3" (Depth not specified)	36–50%
Subsurface fragment volume >3" (Depth not specified)	0–3%

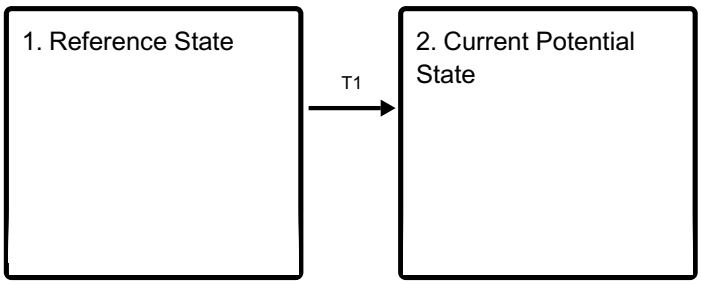
Ecological dynamics

Livestock use of this site is minimized by steep slopes low productivity and surface rock fragments. Site productivity is limited by nearly continuous cover of surface rock fragments. Plant community alterations occur primarily by natural disturbances such as drought and mass movement of surface rock fragments. Species most likely to invade this site are annual grasses. The most productive areas within this site occur adjacent to areas of exposed bedrock. These areas provide plants with a relatively stable zone and additional moisture supplied by runoff from impervious rock surfaces.

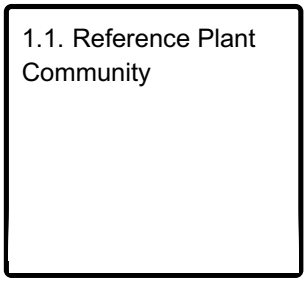
Fire Ecology:
The fire return interval for Wyoming big sagebrush communities ranges from 10 to 70 years. Fire is the principal means of renewal for decadent stands of Wyoming big sagebrush.
Wyoming big sagebrush is killed by fire and establishes after fire from a seedbank; from seed produced by remnant plants that escaped fire; and from plants adjacent to the burn that seed in. Green ephedra generally sprouts vigorously from the roots or woody root crown after fire and rapidly produces aboveground biomass from surviving meristematic tissue.
Desert needlegrass has persistent dead leaf bases, which make it susceptible to burning. Fire removes the accumulation; a rapid, cool fire will not burn deep into the root crown. Needle and thread grass is top-killed by fire. It may be killed if the aboveground stems are completely consumed. Needle and thread grass is classified as slightly to severely damaged by fire. Needle and thread grass sprouts from the caudex following fire, if heat has not been sufficient to kill underground parts. Recovery usually takes 2 to 10 years.

State and transition model

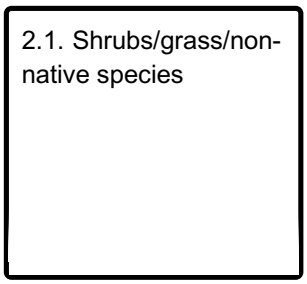
Ecosystem states



State 1 submodel, plant communities



State 2 submodel, plant communities



State 1
Reference State

The Reference State has one community phase. This site is relatively stable because of the high surface rock cover and steep slopes. It is susceptible to non-native plant species establishment (State 2).

Community 1.1
Reference Plant Community

The reference plant community is dominated by green ephedra, Wyoming big sagebrush, and desert needlegrass. Potential vegetative composition is about 40 percent grasses, 10 percent forbs and 50 percent shrubs. Approximate ground cover (basal and crown) is 30 to 40 percent.

Table 5. Annual production by plant type

Plant Type	Low (Kg/Hectare)	Representative Value (Kg/Hectare)	High (Kg/Hectare)
Shrub/Vine	140	196	280
Grass/Grasslike	112	157	224
Forb	28	39	56
Total	**280**	**392**	**560**

State 2
Current Potential State

Similar to the Reference State, except the Current Potential State contains non-native plant species in the community.

Community 2.1
Shrubs/grass/non-native species

The reference plant community is dominated by green ephedra, Wyoming big sagebrush, and desert needlegrass. Non-native plant species are also found in the plant community. Potential vegetative composition is about 40 percent grasses, 10 percent forbs and 50 percent shrubs. Approximate ground cover (basal and crown) is 30 to 40 percent.

Transition T1
State 1 to 2

Establishment of non-native species.

Additional community tables

Table 6. Community 1.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production (Kg/Hectare)	Foliar Cover (%)
Grass/Grasslike					
1	**Primary Perennial Grasses**			77–140	
	desert needlegrass	ACSP12	*Achnatherum speciosum*	39–62	–
	squirreltail	ELEL5	*Elymus elymoides*	19–39	–
	needle and thread	HECO26	*Hesperostipa comata*	19–39	–
2	**Secondary Perennial Grasses**			8–39	
	Indian ricegrass	ACHY	*Achnatherum hymenoides*	2–8	–
	purple threeawn	ARPUP6	*Aristida purpurea var.*	2–8	–

	[illegible]	[illegible]	*purpurea*	[illegible]	
	James' galleta	PLJA	*Pleuraphis jamesii*	2–8	–
	muttongrass	POFE	*Poa fendleriana*	2–8	–
	Sandberg bluegrass	POSE	*Poa secunda*	2–8	–
Forb					
3	**Perennial**			8–31	
	James' galleta	PLJA	*Pleuraphis jamesii*	2–8	–
	beardtongue	PENST	*Penstemon*	2–8	–
	globemallow	SPHAE	*Sphaeralcea*	2–8	–
4	**Annual**			448–16	
Shrub/Vine					
5	**Primary Shrubs**			118–174	
	mormon tea	EPVI	*Ephedra viridis*	78–118	–
	Forb, annual	2FA	*Forb, annual*	4–16	–
6	**Secondary Shrubs**			8–39	
	white sagebrush	ARLU	*Artemisia ludoviciana*	2–8	–
	birchleaf mountain mahogany	CEMOG	*Cercocarpus montanus var. glaber*	2–8	–
	yellow rabbitbrush	CHVI8	*Chrysothamnus viscidiflorus*	2–8	–
	Whipple cholla	CYWH	*Cylindropuntia whipplei*	2–8	–
	hedgehog cactus	ECHIN3	*Echinocereus*	2–8	–
	desert almond	PRFA	*Prunus fasciculata*	2–8	–
	Stansbury cliffrose	PUST	*Purshia stansburiana*	2–8	–
	Gambel oak	QUGA	*Quercus gambelii*	2–8	–
	skunkbush sumac	RHTR	*Rhus trilobata*	2–8	–

Animal community

Livestock Interpretations:
This site is suited to livestock grazing. Grazing management should be keyed to desert needlegrass, needle and thread grass, bottlebrush squirreltail and other perennial grass production. Young desert needlegrass is palatable to all classes of livestock. Mature herbage is moderately grazed by horses and cattle, but rarely grazed by sheep. Needle and thread provides highly palatable forage, especially in the spring before fruits have developed. Needlegrasses are grazed in the fall only if the fruits are softened by rain. Bottlebrush squirreltail is very palatable winter forage for domestic sheep of Intermountain

ranges. Domestic sheep relish the green foliage. Overall, bottlebrush squirreltail is considered moderately palatable to livestock. Green ephedra is heavily browsed by livestock on winter range but only moderately or lightly browsed during other seasons. Livestock browse Wyoming big sagebrush, but may use it only lightly when palatable herbaceous species are available.

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:
Green ephedra is an important browse species for big game animals. Green ephedra is heavily used by wildlife on winter ranges. Wyoming big sagebrush is preferred browse for wild ungulates. Pronghorn usually browse Wyoming big sagebrush heavily. 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. Young desert needlegrass is palatable to many species of wildlife. Desert needlegrass produces considerable basal foliage and is good forage while young. Desert bighorn sheep graze desert needlegrass. Needle and thread is moderately important spring forage for mule deer, but use declines considerably as more preferred forages become available. Bottlebrush squirreltail is a dietary component of several wildlife species. Bottlebrush squirreltail may provide forage for mule deer and pronghorn.

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 made tea from big sagebrush leaves. They used the tea as a tonic, an antiseptic, for treating colds, diarrhea, and sore eyes and as a rinse to ward off ticks. Big sagebrush seeds were eaten raw or made into meal.

Other information

Wyoming big sagebrush is used for stabilizing slopes and gullies and for restoring degraded wildlife habitat, rangelands, mine spoils and other disturbed sites. It is particularly recommended on dry upland sites where other shrubs are difficult to establish.

Green ephedra is listed as a successful shrub for restoring western rangeland communities and can be used to rehabilitate disturbed lands. It also has value for reducing soil erosion on both clay and sandy soils. Green ephedra establishes readily through direct seeding, transplants, and stem cuttings. Needle and thread grass is useful for stabilizing eroded or degraded sites. Bottlebrush squirreltail is tolerant of disturbance and is a suitable species for revegetation.

Inventory data references

NASIS soil component data.

Type locality

Location 1: Lincoln County, NV	
Township/Range/Section	T6S R67E S6
UTM zone	N
UTM northing	416828
UTM easting	718166
General legal description	Antelope Canyon approximately ½ mile north of Caliente, Lincoln County, Nevada

Other references

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

United States Department of Agriculture, Natural Resources Conservation Service. 2022. Land resource regions and major land resource areas of the United States, the Caribbean, and the Pacific Basin. U.S. Department of Agriculture, Agriculture Handbook 296.

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

Contributors

CJ ANDERSON

Approval

Kendra Moseley, 2/20/2025

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	05/21/2025
Approved by	Kendra Moseley
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):**

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:**

17. **Perennial plant reproductive capability:**