

Ecological site R030XC015NV LIMESTONE RIDGE

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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 mountain summits and shoulders, tree canopy is typically less than 15 percent. Slopes range from 4 to 15 percent. Elevations are 6000 to about 7500 feet. The soils associated with this site are very shallow to shallow and well drained. These soils have formed in residuum and colluvium from limestone and dolomite.

Please refer to group concept R030XC036NV to view the provisional STM.

Associated sites

F030XC235NV	Steep Shallow Metamorphic Mesic Mountains
F030XC243NV	Pinus monophylla-Juniperus osteosperma/Purshia stansburiana-Artemisia nova/Bouteloua gracilis

Similar sites

F030XC235NV	Steep Shallow Metamorphic Mesic Mountains Forest site
R030XC017NV	LIMESTONE HILL 13+ P.Z. CEIN7 dominant shrub

Table 1. Dominant plant species

Tree	Not specified
Shrub	(1) <i>Artemisia nova</i> (2) <i>Amelanchier utahensis</i>
Herbaceous	(1) <i>Achnatherum aridum</i>

Physiographic features

This site occurs on mountain summits and shoulders, tree canopy is typically less than 15 percent. Slopes range from 4 to 15 percent. Elevations are 6000 to about 7500 feet.

Table 2. Representative physiographic features

Landforms	(1) Mountain (2) Ridge
Elevation	1,829–2,286 m
Slope	4–15%

Aspect	Aspect is not a significant factor
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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. Average annual precipitation is 8(9) to 12 inches. Mean annual air temperature is 46 to 50 degrees F. The average growing season is about 90 to 120 days.

Table 3. Representative climatic features

Frost-free period (average)	120 days
Freeze-free period (average)	
Precipitation total (average)	305 mm

Influencing water features

There are no influencing water features associated with this site.

Soil features

The soils associated with this site are very shallow to shallow and well drained. These soils have formed in residuum and colluvium from limestone and dolomite. The soil profile is modified with over 35 percent rock fragments. High amounts of rock fragments occur on the soil surface. Coarse fragments on the surface provide a stabilizing affect on surface erosion conditions. Runoff is very high, available water capacity is very low and water intake rates are moderate. The soils are classified as Lithic Torriorthents.

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	20–36 cm
Surface fragment cover <=3"	60–70%
Surface fragment cover >3"	5–10%
Available water capacity (0-101.6cm)	1.27–1.52 cm
Calcium carbonate equivalent (0-101.6cm)	15–30%
Electrical conductivity (0-101.6cm)	0–2 mmhos/cm
Sodium adsorption ratio (0-101.6cm)	0–5
Soil reaction (1:1 water) (0-101.6cm)	7.9–8.4
Subsurface fragment volume <=3" (Depth not specified)	63–66%

Subsurface fragment volume >3" (Depth not specified)	5–8%
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Ecological dynamics

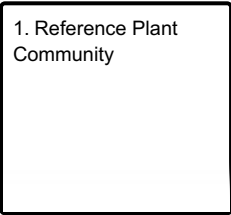
Please refer to group concept R030XC036NV to view the provisional STM.

As ecological condition declines, perennial herbaceous plants are replaced by woody species. Following wildfire, fire tolerant shrubs such as silktassel, manzanita, serviceberry, and squawapple greatly increase. Species such as cheatgrass are likely to invade this site.

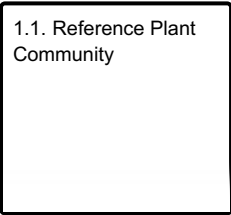
Fire Ecology:
 Black sagebrush communities generally lack enough fine fuels to carry a fire. In addition to low fine fuel loading, wide shrub spacing makes fire infrequent or difficult to prescribe in black sagebrush types. Black sagebrush is highly susceptible to fire-caused mortality; plants are readily killed by all fire intensities. Following burning, reestablishment occurs through off-site sources.
 Aboveground parts of Utah serviceberry may be killed or consumed under fire conditions with sufficient flame lengths. Utah serviceberry may be slightly harmed by fire, depending on moisture conditions, but is generally considered to be fire tolerant. Utah serviceberry sprouts from the root crown following fire. Soil moisture is important to aid sprouting.
 Fire effects to pointleaf manzanita vary with season, severity, and intensity and range from partial consumption to complete consumption of the aboveground plant. Pointleaf manzanita is dependent on fire for germination of its dormant, banked seed.

State and transition model

Ecosystem states



State 1 submodel, plant communities



State 1 Reference Plant Community

Community 1.1 Reference Plant Community

The reference plant community is dominated by black sagebrush, Utah seviceberry and pointleaf manzanita. Utah agave and Mormon needlegrass are important species associated with this site. Singleleaf pinyon and Utah juniper trees comprise less than a 15% canopy cover. Potential vegetative composition is about 15% grasses 5% forbs and 75% shrubs, and 5% trees. Approximate ground cover (basal and crown) is 25 to 40 percent.

Table 5. Annual production by plant type

Plant Type	Low (Kg/Hectare)	Representative Value (Kg/Hectare)	High (Kg/Hectare)
Shrub/Vine	210	294	420
Grass/Grasslike	41	58	84
Tree	15	20	28
Forb	15	20	28
Total	281	392	560

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			28–71	
	Mormon needlegrass	ACAR14	<i>Achnatherum aridum</i>	20–39	–
	Indian ricegrass	ACHY	<i>Achnatherum hymenoides</i>	8–20	–
2	Secondary Perennial Grasses			8–20	
	desert needlegrass	ACSP12	<i>Achnatherum speciosum</i>	2–8	–
	squirreltail	ELEL5	<i>Elymus elymoides</i>	2–8	–
	Sandberg bluegrass	POSE	<i>Poa secunda</i>	2–8	–
Forb					
3	Perennial Forbs			8–31	
4	Annual Forbs			1–12	
Shrub/Vine					
5	Primary Shrubs			146–257	
	black sagebrush	ARNO4	<i>Artemisia nova</i>	78–138	–
	Utah serviceberry	AMUT	<i>Amelanchier utahensis</i>	39–59	–
	pointleaf manzanita	ARPU5	<i>Arctostaphylos pungens</i>	20–39	–
	mormon tea	EPVI	<i>Ephedra viridis</i>	8–20	–
6	Secondary Shrubs			59–99	
	Utah agave	AGUT	<i>Agave utahensis</i>	4–12	–
	Mojave ceanothus	CEGRV	<i>Ceanothus greggii</i> var. <i>vestitus</i>	4–12	–
	littleleaf mountain mahogany	CEIN7	<i>Cercocarpus intricatus</i>	4–12	–
	curl-leaf mountain mahogany	CELE3	<i>Cercocarpus ledifolius</i>	4–12	–
	Heermann's buckwheat	ERHE	<i>Eriogonum heermannii</i>	4–12	–
	ashy silktassel	GAFL2	<i>Garrya flavescens</i>	4–12	–
	spiny greasebush	GLSPA	<i>Glossopetalon spinescens</i> var. <i>aridum</i>	4–12	–
	wild crab apple	PERA4	<i>Peraphyllum ramosissimum</i>	4–12	–
	Stansbury cliffrose	PUST	<i>Purshia stansburiana</i>	4–12	–
	Gambel oak	QUGA	<i>Quercus gambelii</i>	4–12	–
	purple sage	SADOI	<i>Salvia dorrii</i> ssp. <i>dorrii</i> var. <i>incana</i>	4–12	–
Tree					
7	Trees			1–31	
	Utah juniper	JUOS	<i>Juniperus osteosperma</i>	2–16	–
	singleleaf pinyon	PIMO	<i>Pinus monophylla</i>	2–16	–

Animal community

Livestock Interpretations:

This site is suited to livestock grazing during the late spring, summer and early fall. Grazing management should be keyed to peremmmial grass production. Mormon needlegrass is preferred by horses year round, desired by cattle and sheep in the spring. Indian ricegrass is highly palatable to all classes of livestock in both green and cured condition. It supplies a source of green feed before most other native grasses have produced much new growth. In winter, at lower elevations, black sagebrush is heavily utilized by domestic sheep. Utah serviceberry provides good browse for

domestic sheep and domestic goats. In the spring, Utah serviceberry provides fair forage for cattle and good to excellent browse for domestic sheep and goats. Utah serviceberry provides good forage late in winter and in early spring, because it leafs out and blooms earlier than associated species. Pointleaf manzanita provides food and cover for livestock. Domestic goats prefer pointleaf manzanita browse. Green ephedra is heavily browsed by livestock on winter range but only moderately or lightly browsed during other seasons.

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:

Mule deer and Pronghorn antelope prefer to graze on Mormon needlegrass during the spring, however it is undesirable during the winter. Indian ricegrass is eaten by pronghorn in moderate amounts whenever available. A number of heteromyid rodents inhabiting desert rangelands show preference for seed of Indian ricegrass. Indian ricegrass is an important component of jackrabbit diets in spring and summer. Indian ricegrass seed provides food for many species of birds. Doves, for example, eat large amounts of shattered Indian ricegrass seed lying on the ground. Black sagebrush is a significant browse species within the Intermountain region. It is especially important on low elevation winter ranges in the southern Great Basin, where extended snow free periods allow animal's access to plants throughout most of the winter. In these areas it is heavily utilized by pronghorn and mule deer. Utah serviceberry is a very important species for mule deer in the Great Basin. Porcupines and desert bighorn sheep also use Utah serviceberry. Utah serviceberry fruit is preferred by many birds. It can be an important winter food for birds since berries stay on the shrub throughout the winter. In Nevada, sage grouse eat the fruit of Utah serviceberry. Pointleaf manzanita provides food and cover for wildlife. Many frugivorous animals eat the berries, including blue grouse, Gambel's quail, mule deer, American black bears, coyotes and skunks. Palatability of pointleaf manzanita is considered "low" for deer species. Pointleaf Manzanita stands are considered excellent cover for deer and desert bighorn sheep. Green ephedra is an important browse species for big game animals. Green ephedra is heavily used by wildlife on winter ranges.

Sagebrush-grassland communities provide critical sage-grouse breeding and nesting habitats. 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.

Hydrological functions

Runoff is very high. Peremeability is moderate.

Recreational uses

This site is suitable for camping and hiking.

Other products

Utah serviceberry fruits were used by Native Americans and early European explorers in North America for food and medicine.

Other information

Black sagebrush is an excellent species to establish on sites where management objectives include restoration or improvement of domestic sheep, pronghorn, or mule deer winter range.

Utah serviceberry has been used to revegetate big game winter range and for surface stabilization. It grows slowly from seed and therefore transplanting may be more successful than seeding for revegetation projects.

Type locality

Location 1: Clark County, NV	
Township/Range/Section	T21S R58E S30

General legal description	Approximately 5 miles north of Mountain Springs Summit on NvHwy 160, Spring Mountains, Clark County, Nevada.
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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

TJ WOLFE

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	05/12/2025
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:**
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7. **Amount of litter movement (describe size and distance expected to travel):**
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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):**
-
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:**
-
11. **Presence and thickness of compaction layer (usually none; describe soil profile features which may be mistaken for compaction on this site):**
-
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:
-
13. **Amount of plant mortality and decadence (include which functional groups are expected to show mortality or decadence):**
-
14. **Average percent litter cover (%) and depth (in):**
-
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:**
