

Ecological site R030XC025NV SHALLOW LIMESTONE SLOPE 11-13 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

This site occurs on mountain backslopes. Slopes range from 30 to 50 percent. Elevation ranges from 4700 to 7600 feet. The soils associated with this site are shallow, well drained soils that formed in residuum and colluvium from limestone and dolomitic limestone.

Please refer to group concept R030XC040NV to view the provisional STM.

Associated sites

F030XC246NV	Pinus monophylla-Juniperus osteosperma/Purshia stansburiana-Artemisia tridentata ssp. vaseyana/Poa fendleriana Forest site at higher elevations on mountain backslopes.
R030XA007NV	GRAVELLY LOAM 5-7 P.Z. Blackbrush site at lower elevations on fans.

Similar sites

F030XC246NV	Pinus monophylla-Juniperus osteosperma/Purshia stansburiana-Artemisia tridentata ssp. vaseyana/Poa fendleriana Forest site at higher elevations on mountain back slopes.
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Table 1. Dominant plant species

Tree	Not specified
Shrub	(1) <i>Artemisia tridentata ssp. vaseyana</i>
Herbaceous	(1) <i>Achnatherum speciosum</i>

Physiographic features

This site occurs on mountain backslopes. Slopes range from 30 to 50 percent. Elevation ranges from 4700 to 7600 feet.

Table 2. Representative physiographic features

Landforms	(1) Mountain slope
Elevation	1,433–2,316 m
Slope	30–50%
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 11 to 13 inches and mean annual air temperature is 51 to 56 degrees F., and the frost-free season is 130 to 180 days.

Table 3. Representative climatic features

Frost-free period (average)	180 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 are shallow, well drained soils that formed in residuum and colluvium from limestone and dolomitic limestone. Surface soils are medium to coarse textured. Runoff is very high, and potential for gully, sheet or rill erosion varies with slopes. Water holding capacity is very low. The soils are dry most of the year but are moist for short periods during the winter and early spring months and occasionally for short intermittent period following summer convection storms. The soils have an aridic soil moisture regime bordering on ustic. Soil series associated with this site include Scrapy.

Table 4. Representative soil features

Surface texture	(1) Very gravelly sandy loam (2) Extremely gravelly sandy loam
Family particle size	(1) Loamy
Drainage class	Well drained
Permeability class	Moderately rapid
Soil depth	25–36 cm
Surface fragment cover <=3"	45–60%
Surface fragment cover >3"	5–15%
Available water capacity (0-101.6cm)	1.78–2.29 cm
Calcium carbonate equivalent (0-101.6cm)	25–35%
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)	7.9–9
Subsurface fragment volume <=3" (Depth not specified)	50–60%

Subsurface fragment volume >3" (Depth not specified)	0–1%
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Ecological dynamics

Please refer to group concept R030XC040NV to view the provisional STM.

Where fire occurs due to fuel build up, fire will remove the trees and shrubs. Shrubs that will reestablish include mountain big sagebrush and Stansbury's cliffrose. Where management results in abusive grazing use by livestock and/or feral horses, cool-season perennial grasses decrease as mountain big sagebrush becomes more dominant.

Fire Ecology:

Presettlement fire return intervals in mountain big sagebrush communities varied from 15 to 25 years. Mountain big sagebrush is highly susceptible to injury from fire. It is often top-killed by fire and will not resprout. Blackbrush stands are considered to be one of the most flammable native plant assemblages in the Mojave Desert and fire will start and spread easily due to the dense, close spacing nature and resinous foliage of blackbrush. Blackbrush is slow to reestablish and may take 60 or more years to reestablish. Fire effects on Stansbury cliffrose are variable. Fire may kill or severely damage plants. Late-season fire also increases the risk of mortality. Stansbury cliffrose is a weak sprouter that is generally killed by severe fire. Mormon tea 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. Most perennial grasses have root crowns that can survive wildfire.

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 is dominated by mountain big sagebrush and Stansbury's cliffrose. Blackbrush, Mormon tea, and desert needlegrass are important species associated with this site. Potential vegetative composition is about 20% grasses, 5% forbs and 70% shrubs and up to 5% trees. Approximate ground cover (basal and crown) is about 15 to 25 percent. Total annual air-dry production is 700 pounds favorable years, 500 pounds normal years, and 300 pounds on unfavorable years.

Table 5. Annual production by plant type

Plant Type	Low (Kg/Hectare)	Representative Value (Kg/Hectare)	High (Kg/Hectare)
Shrub/Vine	235	392	549
Grass/Grasslike	67	112	157
Tree	17	28	39
Forb	17	28	39
Total	336	560	784

Table 6. Ground cover

Tree foliar cover	1-10%
Shrub/vine/liana foliar cover	10-20%
Grass/grasslike foliar cover	5-10%
Forb foliar cover	1-5%
Non-vascular plants	0%
Biological crusts	0%
Litter	5-10%
Surface fragments >0.25" and <=3"	40-60%
Surface fragments >3"	5-15%
Bedrock	0%
Water	0%
Bare ground	10-25%

Table 7. Canopy structure (% cover)

Height Above Ground (M)	Tree	Shrub/Vine	Grass/ Grasslike	Forb
<0.15	1-2%	1-5%	1-5%	1-2%
>0.15 <= 0.3	1-5%	5-10%	5-10%	1-5%
>0.3 <= 0.6	1-5%	20-20%	–	–
>0.6 <= 1.4	1-5%	1-5%	–	–
>1.4 <= 4	5-10%	–	–	–
>4 <= 12	–	–	–	–
>12 <= 24	–	–	–	–
>24 <= 37	–	–	–	–
>37	–	–	–	–

Additional community tables

Table 8. Community 1.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production (Kg/Hectare)	Foliar Cover (%)
Grass/Grasslike					
1	Primary Perennial Grasses			56–112	
	desert needlegrass	ACSP12	<i>Achnatherum speciosum</i>	56–112	–
2	Secondary Perennial Grasses			6–28	
	Indian ricegrass	ACHY	<i>Achnatherum hymenoides</i>	6–17	–
	squirreltail	ELEL5	<i>Elymus elymoides</i>	6–17	–
Forb					
3	Perennial Forbs			17–28	
	blue grama	BOGR2	<i>Bouteloua gracilis</i>	6–11	–
	sandwort	ARENA	<i>Arenaria</i>	3–11	–
	milkvetch	ASTRA	<i>Astragalus</i>	3–11	–
	Indian paintbrush	CAST12	<i>Castilleja</i>	3–11	–
	desert larkspur	DEPA	<i>Delphinium parishii</i>	3–11	–
	flax	LINUM	<i>Linum</i>	3–11	–
	Fremont's phacelia	PHFR2	<i>Phacelia fremontii</i>	3–11	–
	twinpod	PHYSA2	<i>Physaria</i>	3–11	–
	desert globemallow	SPAM2	<i>Sphaeralcea ambigua</i>	3–11	–
	desert princesplume	STPI	<i>Stanleya pinnata</i>	3–11	–
	foothill deathcamas	ZIPA2	<i>Zigadenus paniculatus</i>	3–11	–
4	Annual Forbs			1–11	
	cryptantha	CRYPT	<i>Cryptantha</i>	3–11	–
Shrub/Vine					
5	Primary Shrubs			241–448	
	mountain big sagebrush	ARTRV	<i>Artemisia tridentata ssp. vaseyana</i>	168–224	–
	blackbrush	CORA	<i>Coleogyne ramosissima</i>	28–84	–
	Stansbury cliffrose	PUST	<i>Purshia stansburiana</i>	28–84	–
	mormon tea	EPVI	<i>Ephedra viridis</i>	17–56	–
6	Secondary Shrubs			28–56	
	black sagebrush	ARNO4	<i>Artemisia nova</i>	6–11	–
	hedgehog cactus	ECHIN3	<i>Echinocereus</i>	6–11	–
	spiny greasewood	GLSPA	<i>Glossopetalon spinescens var. aridum</i>	6–11	–
	tulip pricklypear	OPPH	<i>Opuntia phaeacantha</i>	6–11	–
	desert almond	PRFA	<i>Prunus fasciculata</i>	6–11	–
	banana yucca	YUBA	<i>Yucca baccata</i>	6–11	–
Tree					
7	Trees			17–39	
	Utah juniper	JUOS	<i>Juniperus osteosperma</i>	11–22	–
	singleleaf pinyon	PIMO	<i>Pinus monophylla</i>	6–17	–

Animal community

Livestock Interpretations:

This site has limited value for livestock grazing, due to the low forage production. Grazing management should be keyed to perennial grasses or palatable shrubs production. 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. Blackbrush is not preferred as forage by domestic livestock, but does provide some forage during the spring, summer and fall. Stansbury cliffrose is an important browse species for livestock, especially in the winter. Mormon Tea is heavily browsed by livestock on winter range but only moderately or lightly browsed during other seasons. Young desert needlegrass is palatable to all classes of livestock. Mature herbage is moderately grazed by horses and cattle, but rarely grazed by sheep.

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. Blackbrush is a valuable browse species for bighorn sheep. It may also comprise up to 25% of the mule deer winter diet. Blackbrush provides cover for upland game birds, nongame birds and small mammals. Stansbury cliffrose is an important browse species for mule deer, pronghorn, game birds, and songbirds. Wild ungulates use it heavily in winter. Mormon tea is an important browse species for big game animals. Mormon tea is heavily used by wildlife on winter ranges. 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. 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.

Hydrological functions

Rills – Rills can occur on this site, especially following summer convective storms due to very shallow, skeletal, loamy soils with low water holding capacity and steep slopes. Rills are more likely to appear on steeper slopes. Water flow Patterns – Found in interspaces between shrubs, connected on steeper slopes. Should be limited except following intense summer storms.

Pedestals and/or Terracettes – Few to none. High gravel cover limits pedestal development. Some terracettes found on steeper slopes.

Gullies – Not uncommon on steep slopes.

Perennial herbaceous plants slow runoff and increase infiltration. Shrub and tree canopy and associated litter break raindrop impact and provide opportunity for snow catch and accumulation on site.

Recreational uses

This site is used for camping, hiking and hunting.

Other products

Indian ricegrass was traditionally eaten by some Native American peoples. The Paiutes used seed as a reserve food source.

Other information

Blackbrush contributes to desert fertility by 1) protecting the soil against wind erosion through retarding the movement of soil and increasing the accumulation of fine soil particles around its base; 2) protecting understory vegetation from the effects of high temperatures, thereby helping to retain surface nitrogen and adding organic matter to the soil; and 3) serving as a nitrogen reservoir through the storage of nitrogen in roots, leaves, and stems. Desert needlegrass seeds are easily germinated and have potential for commercial use. Desert needlegrass may be used for groundcover in areas of light disturbance, but it is susceptible to excessive trampling.

Indian ricegrass is well-suited for surface erosion control and desert revegetation although it is not highly effective in controlling sand movement.

Type locality

Location 1: Clark County, NV	
Township/Range/Section	T19 S. R55 E. S7 NE
UTM zone	N
UTM northing	4019988n
UTM easting	0604382e
General legal description	Approximately 2.5 miles north of the junction of Wheeler Wash Road and the Wallace Canyon turn off, Clark County, Nevada.

Other references

Clokey, Ira. 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>.

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

Nachlinger, J., 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)	TJ WOLFE
Contact for lead author	State Rangeland Management Specialist
Date	06/22/2006
Approved by	Sarah Quistberg
Approval date	
Composition (Indicators 10 and 12) based on	Annual Production

Indicators

1. **Number and extent of rills:** Rills can occur on this site, especially following summer convective storms due to very shallow, skeletal, loamy soils with low water holding capacity and steep slopes. Rills are more likely to appear on steeper slopes.

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2. **Presence of water flow patterns:** Found in interspaces between shrubs, connected on steeper slopes. Should be limited except following intense summer storms.
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3. **Number and height of erosional pedestals or terracettes:** Few to none. High gravel cover limits pedestal development. Some terracettes found on steeper slopes.
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4. **Bare ground from Ecological Site Description or other studies (rock, litter, lichen, moss, plant canopy are not bare ground):** 10 to 25 percent
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5. **Number of gullies and erosion associated with gullies:** Not uncommon on steep slopes.
-
6. **Extent of wind scoured, blowouts and/or depositional areas:** No wind-scoured or blow out areas due to high gravel cover. Small depositional areas found up slope of grasses and large shrubs.
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7. **Amount of litter movement (describe size and distance expected to travel):** Litter expected to move the distance of slope length during intense summer convection storms.
-
8. **Soil surface (top few mm) resistance to erosion (stability values are averages - most sites will show a range of values):** Soil surface resistance due to high amounts of gravels and vegetative cover and litter. Stability values be 3-5 (not tested).
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9. **Soil surface structure and SOM content (include type of structure and A-horizon color and thickness):** Soils have low organic matter. "A" horizon averages 1 to 3 inch depth.
-
10. **Effect of community phase composition (relative proportion of different functional groups) and spatial distribution on infiltration and runoff:** Perennial herbaceous plants slow runoff and increase infiltration. Shrub and tree 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):** None
-
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):**
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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:**
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17. **Perennial plant reproductive capability:**
-