

Ecological site R030XC022NV BOULDERY SANDSTONE 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 concave footslopes of mountains and sandstone outcrops. Slopes typically range from 50 to 75 percent. Elevations are 4500 to about 7000 feet. The soils associated with this site are shallow and have formed in colluvium from sandstone parent material. Please refer to group concept R030XB094CA to view the provisional STM.

Associated sites

R030XC007NV	SHALLOW GRAVELLY LOAM 7-9 P.Z.
R030XC010NV	SHALLOW SANDSTONE HILL 7-11 P.Z.

Similar sites

R030XC010NV	SHALLOW SANDSTONE HILL 7-11 P.Z. CORA dominant shrub
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Table 1. Dominant plant species

Tree	Not specified
Shrub	(1) <i>Quercus turbinella</i>
Herbaceous	(1) <i>Achnatherum</i>

Physiographic features

This site occurs on concave footslopes of mountains and sandstone outcrops. Slopes typically range from 50 to 75 percent. Elevations are 4500 to about 7000 feet.

Table 2. Representative physiographic features

Landforms	(1) Mountain slope
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Elevation	1,370 – 2,130 m
Slope	50 – 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. Average annual precipitation is (11)12 to about 14 inches. Mean annual air temperature is 48 to 54 degrees F. The average growing season is about 140 to 180 days.

Table 3 Representative climatic features

Frost-free period (average)	180 days
Freeze-free period (average)	
Precipitation total (average)	360 mm

Influencing water features

There are no influencing water features associated with this site.

Soil features

Please refer to group concept R030XB094CA to view the provisional STM.

The soils associated with this site are shallow and have formed in colluvium from sandstone parent material. Available water capacity is very low. Infiltration is rapid and permeability is moderate. The surface has very high amounts of large stones and boulders. These 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 periods following summer convection storms. The soils are classified as Seralin Family.

Table 4. Representative soil features

Surface texture	(1) Extremely stony loam
Family particle size	(1) Loamy
Drainage class	Well drained
Permeability class	Moderate
Soil depth	30 – 50 cm

Surface fragment cover <=3"	30 – 40 %
Surface fragment cover >3"	10 – 20 %
Available water capacity (0-101.6cm)	1.78 – 2.03 cm
Calcium carbonate equivalent (0-101.6cm)	Not specified
Electrical conductivity (0-101.6cm)	0 – 10 mmhos/cm
Sodium adsorption ratio (0-101.6cm)	0 – 10
Soil reaction (1:1 water) (0-101.6cm)	7.4 – 8.4
Subsurface fragment volume <=3" (Depth not specified)	30 – 40 %
Subsurface fragment volume >3" (Depth not specified)	10 – 20 %

Ecological dynamics

As ecological condition declines, cool-season perennial grasses decrease as woody plants becomes more dominant. Following wildfire, turbinella oak, manzanita and silktassle greatly increase.

Fire Effects:

Turbinella oak is well adapted to survive fire and typically resprouts vigorously from the root crown and rhizomes in response to fire or other disturbance. 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. Mountain big sagebrush is highly susceptible to injury from fire. It is often top-killed by fire and will not resprout. Little Parish's needlegrass is damaged by burning due to the dense plant material that can burn slowly and long, charring to the growing points. Late summer and early fall fires are the least harmful. 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. Indian ricegrass can be killed by fire, depending on severity and season of burn. Indian ricegrass reestablishes on burned sites through seed dispersed from adjacent unburned areas. Muttongrass is unharmed to slightly harmed by light-severity fall fires. Muttongrass appears to be harmed by and slow to recover from severe fire.

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			71-196	
	little Parish's needlegrass	ACPAD	<i>Achnatherum parishii</i> var. <i>depauperatum</i>	19-58	–
	desert needlegrass	ACSP12	<i>Achnatherum speciosum</i>	19-58	–
	muttongrass	POFE	<i>Poa fendleriana</i>	16-39	–
	Indian ricegrass	ACHY	<i>Achnatherum hymenoides</i>	16-39	–
2	Secondary Perennial Grasses			1-24	
	squirreltail	ELEL5	<i>Elymus elymoides</i>	4-16	–
	Sandberg bluegrass	POSE	<i>Poa secunda</i>	4-16	–
Forb					
3	Perennial Forbs			16-39	
4	Annual Forbs			1-24	
Shrub/Vine					
5	Primary Shrubs			330-510	
	Sonoran scrub oak	QUTU2	<i>Quercus turbinella</i>	196-235	–
	pointleaf manzanita	ARPU5	<i>Arctostaphylos pungens</i>	78-118	–
	mountain big sagebrush	ARTRV	<i>Artemisia tridentata</i> ssp. <i>vaseyana</i>	39-78	–
	ashy silttassel	GAFL2	<i>Garrya flavescens</i>	16-78	–
6	Secondary Shrubs			39-78	
	Utah serviceberry	AMUT	<i>Amelanchier utahensis</i>	8-16	–
	mormon tea	EPVI	<i>Ephedra viridis</i>	8-16	–
	narrowleaf yerba santa	ERAN2	<i>Eriodictyon angustifolium</i>	8-16	–
	skunkbush sumac	RHTR	<i>Rhus trilobata</i>	8-16	–
	snowberry	SYMPH	<i>Symphoricarpos</i>	8-16	–
Tree					
7	Trees			1-39	
	California redbud	CEOR9	<i>Cercis orbiculata</i>	4-16	–
	Utah juniper	JUOS	<i>Juniperus osteosperma</i>	4-16	–
	singleleaf pinyon	PIMO	<i>Pinus monophylla</i>	4-16	–
	ponderosa pine	PIPOS	<i>Pinus ponderosa</i> var. <i>scopulorum</i>	4-16	–

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. Turbinella oak generally provides relatively little browse for most species of livestock. In many areas it is used heavily only when other more palatable species are lacking. Pointleaf manzanita provides food and cover for livestock. Domestic goats prefer pointleaf manzanita browse. 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. Little Parish's needlegrass provides a palatable, nutritious feed during the spring and early summer for livestock. Young desert needlegrass is palatable to all classes of livestock. Mature herbage is moderately grazed by horses and cattle, but rarely grazed by sheep. 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. Muttongrass is excellent forage for domestic livestock especially in the early spring. Muttongrass begins growth in late winter and early spring, which makes it available before many other forage plants. 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: The foliage of turbinella oak is utilized to at least some degree by a number of big game species. New, succulent growth is the most palatable and is readily consumed. 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. Mountain big sagebrush is highly preferred and nutritious winter forage for mule deer and elk. Little Parish's needlegrass provides a palatable, nutritious feed during the

spring and early summer for wildlife. 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. 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. Deer and elk make heavy use of muttongrass, especially in early spring when other green forage is scarce. Depending upon availability of other nutritious forage, deer may use muttongrass in all seasons. Muttongrass cures well and is an important fall and winter deer food in some areas. 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

Runoff is very high. Permeability is moderate.

Recreational uses

This site has limited value for recreation due to the steep slopes.

Other information

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	T20S R58E S33
General legal description	Mountain footslopes near Willow Springs site within Red Rock National Conservation Area, Spring Mountains, Clark County, Nevada.
Location 2: Clark County, NV	
Township/Range/Section	T21S R58E S8
General legal description	Intermountain valley fans, inset fans, and narrow canyons within Aztec Sandstone Formation of Spring Mountains. About 1½ miles southwest of Willow Springs site within Red Rock National Conservation Area, Clark County, Nevada.

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	09/20/2026
Approved by	
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):

9. Soil surface structure and SOM content (include type of structure and A-horizon color and thickness):

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:
