Ecological site R030XC011NV
GRAVELLY INSET FAN 7-9 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 inset fans and stream terraces of upper piedmont slopes. Slope gradients of 2 to 8 percent are most typical. Elevations are 5350 to 6400 feet. The soils associated with this site are moderately deep to deep and derived from mixed rock sources.

Please refer to group concept R030XB098NV to view the provisional STM.

Associated sites

R030XB051NV	**UPLAND WASH**
R030XC007NV	**SHALLOW GRAVELLY LOAM 7-9 P.Z.**

Similar sites

R030XB051NV	**UPLAND WASH** PLRI3 dominant grass
R030XC007NV	**SHALLOW GRAVELLY LOAM 7-9 P.Z.** PRFA, SAMO3 absent
R030XC018NV	**SHALLOW GRAVELLY SLOPE 11-13 P.Z.** PRFA minor species, SAMO3 absent
R030XB090NV	**GRAVELLY FAN 7-9 P.Z.** BOER4 dominant grass
R030XB108NV	**GRAVELLY INSET FAN 7-9 P.Z.** PLRI3 dominant grass

Table 1. Dominant plant species

Tree	Not specified
Shrub	(1) *Coleogyne ramosissima* (2) *Prunus fasciculata*
Herbaceous	(1) *Achnatherum speciosum*

Physiographic features

This site occurs on inset fans and stream terraces of upper piedmont slopes. Slope gradients of 2 to 8 percent are most typical. Elevations are 5350 to 6400 feet.

Table 2. Representative physiographic features

Landforms	(1) Inset fan (2) Stream terrace
Flooding duration	Very brief (4 to 48 hours)
Flooding frequency	Rare
Elevation	1,631–1,951 m
Slope	2–8%
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 7 to 9(10) inches. Mean annual air temperature is 54 to 65 degrees F. The average growing season is about 140 to 210 days.

Table 3. Representative climatic features

Frost-free period (average)	210 days
Freeze-free period (average)	
Precipitation total (average)	229 mm

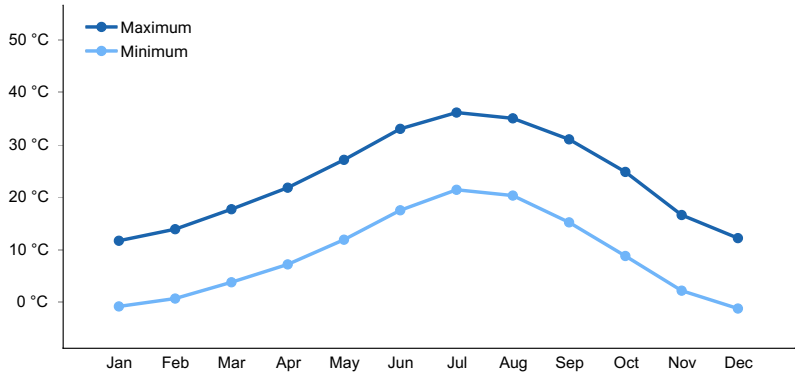

Figure 1. Monthly average minimum and maximum temperature

Influencing water features

This site is subject to flood flows during spring runoff and during convective summer storms.

Soil features

The soils associated with this site are moderately deep to deep and derived from mixed rock sources. Water intake rates are moderately rapid, available water capacity is low, runoff is low and soils are well drained to somewhat excessively drained. The soils are subject to periodic (often intense) flood flows that occur primarily during summer convection storm activity. The soils are classified as Aridic Calcixerolls and Typic Haplocalcids.

Table 4. Representative soil features

Surface texture	(1) Very gravelly sandy loam (2) Extremely cobbly fine sandy loam

Family particle size	(1) Loamy
Drainage class	Well drained to somewhat excessively drained
Permeability class	Moderately rapid
Soil depth	183 cm
Surface fragment cover <=3"	40–45%
Surface fragment cover >3"	5–35%
Available water capacity (0-101.6cm)	4.32–6.35 cm
Electrical conductivity (0-101.6cm)	0–8 mmhos/cm
Sodium adsorption ratio (0-101.6cm)	0–13
Soil reaction (1:1 water) (0-101.6cm)	7.9–9
Subsurface fragment volume <=3" (Depth not specified)	24–66%
Subsurface fragment volume >3" (Depth not specified)	2–17%

Ecological dynamics

Please refer to group concept R030XB098NV to view the provisional STM.

With severe disturbance such as flash flood flows or wildfire, snakeweed, Mojave buckwheat and burrobrush significantly increase. Species likely to invade this site are introduced annuals such as red brome and filaree.

Fire Ecology:
Blackbrush communities historical fire return intervals appear to have been on the order of centuries, allowing late seral blackbrush stands to reestablish. Low amounts of fine fuels in interspaces probably limited fire spread to only extreme fire conditions, during which high winds, low relative humidity, and low fuel moisture led to high intensity stand-replacing crown fires. The fuel complex in blackbrush appears to be more conducive to burning now than in the past. Non-native annual grasses currently occur in most blackbrush stands resulting in large stand-replacing fires. 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. Desert peach sprouts from rhizomes and/or lignotubers following fire, and becomes abundant on burned sites. Postfire seedling establishment is rare based on the limited postfire regeneration studies available. Desert peach is typically only top-killed by fire. Neither aboveground stem survival nor complete shrub kill is reported following fire. 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. 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. 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

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 blackbrush. Other important species associated with this site include desert needlegrass, muttongrass, and desert peach, and Mojave sage. Potential vegetative composition is about 20% grasses, 5% annual and perennial forbs and 75% shrubs. 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	336	504	673
Grass/Grasslike	90	135	179
Forb	22	34	45
Total	**448**	**673**	**897**

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**			47–155	
	desert needlegrass	ACSP12	*Achnatherum speciosum*	34–101	–
	muttongrass	POFE	*Poa fendleriana*	13–54	–
2	**Secondary Perennial Grasses**			1–54	
	Indian ricegrass	ACHY	*Achnatherum hymenoides*	3–20	–
	threeawn	ARIST	*Aristida*	3–20	–
	bush muhly	MUPO2	*Muhlenbergia porteri*	3–20	–
Forb					
3	**Perennial Forbs**			13–54	
4	**Annual Forbs**			1–54	
Shrub/Vine					
5	**Primary Shrubs**			284–572	
	blackbrush	CORA	*Coleogyne ramosissima*	202–303	–
	desert almond	PRFA	*Prunus fasciculata*	67–135	–
	Stansbury cliffrose	PUST	*Purshia stansburiana*	1–67	–
	Mojave sage	SAMO3	*Salvia mohavensis*	13–67	–
6	**Secondary Shrubs**			67–101	
	Shockley's goldenhead	ACSH	*Acamptopappus shockleyi*	7–13	–
	woolly fruit bur ragweed	AMER	*Ambrosia eriocentra*	7–13	–
	big sagebrush	ARTR2	*Artemisia tridentata*	7–13	–
	fourwing saltbush	ATCA2	*Atriplex canescens*	7–13	–
	Virgin River brittlebush	ENVI	*Encelia virginensis*	7–13	–
	jointfir	EPHED	*Ephedra*	7–13	–
	narrowleaf yerba santa	ERAN2	*Eriodictyon angustifolium*	7–13	–
	Eastern Mojave buckwheat	ERFAP	*Eriogonum fasciculatum var. polifolium*	7–13	–
	Apache plume	FAPA	*Fallugia paradoxa*	7–13	–
	threadleaf snakeweed	GUMI	*Gutierrezia microcephala*	7–13	–
	burrobrush	HYSA	*Hymenoclea salsola*	7–13	–
	spiny menodora	MESP2	*Menodora spinescens*	7–13	–
	Fremont's dalea	PSFR	*Psorothamnus fremontii*	7–13	–
	Sonoran scrub oak	QUTU2	*Quercus turbinella*	7–13	–
	skunkbush sumac	RHTR	*Rhus trilobata*	7–13	–
	banana yucca	YUBA	*Yucca baccata*	7–13	–
	Joshua tree	YUBR	*Yucca brevifolia*	7–13	–
Tree					
7	**Trees**			3–13	
	Utah juniper	JUOS	*Juniperus osteosperma*	3–13	–

Animal community

Livestock Interpretations:

This site is suited to grazing by livestock during the late spring, summer and early fall. Grazing management should be keyed to perennial grasses or palatable shrubs production. Blackbrush is not preferred as forage by domestic livestock, but does provide some forage during the spring, summer and fall. Heavy grazing by livestock decreased the per acre stem count of desert peach. Stansbury cliffrose is an important browse species for livestock, especially in the winter. Young desert needlegrass is palatable to all classes of livestock. Mature herbage is moderately grazed by horses and cattle, but rarely grazed by sheep. 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:
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. Use of desert peach by mule deer varies largely by location; as low as 1-5% of diet on some sites and up to 57% on other sites. Mule deer consume new desert peach growth in the early spring and frequent desert peach habitat. Numerous small mammals gather and consume desert peach fruits and seeds and/or browse desert peach stemsWhite-tailed antelope squirrels, Great Basin pocket mice, deer mice, and Panamint kangaroo rats utilize desert peach fruits and seeds. Black-tailed jackrabbits seasonally utilize desert peach as forage. Stansbury cliffrose is an important browse species for mule deer, pronghorn, game birds, and songbirds. Wild ungulates use it heavily in winter. 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. 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.

Hydrological functions

Runoff is low. 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

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. 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	T21S R58E S4
General legal description	About ½ mile east of Willow Spring site along the paved loop road 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)	PATTI NOVAK-ECHENIQUE
Contact for lead author	State Rangeland Management Specialist
Date	07/20/2012
Approved by	Sarah Quistberg
Approval date	
Composition (Indicators 10 and 12) based on	Annual Production

Indicators

1. **Number and extent of rills:** Rills are none to rare. Rock fragments armor the soil surface.

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2. **Presence of water flow patterns:** Water flow patterns are none to rare. Rock fragments armor the soil surface.

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3. **Number and height of erosional pedestals or terracettes:** Pedestals are none to rare. Occurrence is usually limited to areas of water flow patterns. Frost heaving of shallow rooted plants should not be considered a normal condition.

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4. **Bare ground from Ecological Site Description or other studies (rock, litter, lichen, moss, plant canopy are not bare ground):** Bare Ground ± 10-20%.

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5. **Number of gullies and erosion associated with gullies:** Gullies are none to rare in areas of this site that occur on stable landforms.

6. **Extent of wind scoured, blowouts and/or depositional areas:** None

7. **Amount of litter movement (describe size and distance expected to travel):** Fine litter (foliage from grasses and annual & perennial forbs) expected to move distance of slope length during intense summer convection storms or rapid snowmelt events. Persistent litter (large woody material) will remain in place except during catastrophic events.

8. **Soil surface (top few mm) resistance to erosion (stability values are averages - most sites will show a range of values):** Soil stability values should be 3 to 6 on most soil textures found on this site. Areas of this site occurring on soils that have a physical crust will probably have stability values less than 3. (To be field tested.)

9. **Soil surface structure and SOM content (include type of structure and A-horizon color and thickness):** Surface structure is thick platy. Soil surface colors are light and soils are typified by an ochric epipedon. Organic matter of the surface 2 to 3 inches is typically 1.5 to 2 percent dropping off quickly below. Organic matter content can be more or less depending on micro-topography.

10. **Effect of community phase composition (relative proportion of different functional groups) and spatial distribution on infiltration and runoff:** Perennial herbaceous plants (especially deep-rooted bunchgrasses [i.e., basin wildrye]) slow runoff and increase infiltration. Shrub canopy and associated litter break raindrop impact and provide opportunity for snow catch and accumulation on site.

11. **Presence and thickness of compaction layer (usually none; describe soil profile features which may be mistaken for compaction on this site):** Compacted layers are not typical. Subangular blocky or massive sub-surface horizons are not to be interpreted as compacted layers.

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: Tall shrubs (spiny hopsage & Wyoming big sagebrush)

    Sub-dominant: deep-rooted, cool season, perennial bunchgrasses > shallow-rooted, cool season, perennial bunchgrasses > associated shrubs > deep-rooted, cool season, perennial forbs = fibrous, shallow-rooted, cool season, perennial forbs = annual forbs

    Other:

    Additional:

13. **Amount of plant mortality and decadence (include which functional groups are expected to show mortality or decadence):** Dead branches within individual shrubs common and standing dead shrub canopy material may be as much as 25% of total woody canopy; some of the mature bunchgrasses (<20%) have dead centers.

14. **Average percent litter cover (%) and depth (in):** Within plant interspaces (± 15%) and depth of litter is ±¼ inch.

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15. **Expected annual annual-production (this is TOTAL above-ground annual-production, not just forage annual-production):** For normal or average growing season (end of May) ± 800 lbs/ac.

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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:** Increasers include rabbitbrush. Invaders include cheatgrass, halogeton, Russian thistle, bassia, and annual mustards.

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17. **Perennial plant reproductive capability:** All functional groups should reproduce in average (or normal) and above average growing season years.
