Ecological site R030XC024NV
GRAVELLY FAN 9-11 P.Z.

Last updated: 2/25/2025
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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.

Ecological site concept

This site occurs on smooth fan remnants. Slopes range from 4 to 15 percent. Elevations range from 5540 to 6660 feet. The soils associated with this site are moderately deep to a petrocalcic horizon. Soils have formed in alluvium from limestone and dolostone.

Please refer to group concept R030XC034NV to view the provisional STM.

Associated sites

F030XC243NV	**Pinus monophylla-Juniperus osteosperma/Purshia stansburiana-Artemisia nova/Bouteloua gracilis**
R030XC018NV	**SHALLOW GRAVELLY SLOPE 11-13 P.Z.**

Similar sites

R030XC013NV	**LOAMY BOTTOM 11-13 P.Z.** Higher production, deeper soils, basin sagebrush and basin wildrye site.

Table 1. Dominant plant species

Tree	Not specified
Shrub	(1) *Artemisia tridentata ssp. vaseyana* (2) *Purshia stansburiana*
Herbaceous	(1) *Achnatherum speciosum*

Physiographic features

This site occurs on smooth fan remnants. Slopes range from 4 to 15 percent. Elevations range from 5540 to 6660 feet.

Table 2. Representative physiographic features

Landforms	(1) Fan remnant
Elevation	1,689–2,030 m
Slope	4–15%
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 9 to 11 inches and mean annual air temperature is 45 to 50 degrees F., and the frost-free season is 90 to 130 days.

Table 3. Representative climatic features

Frost-free period (average)	130 days
Freeze-free period (average)	
Precipitation total (average)	279 mm

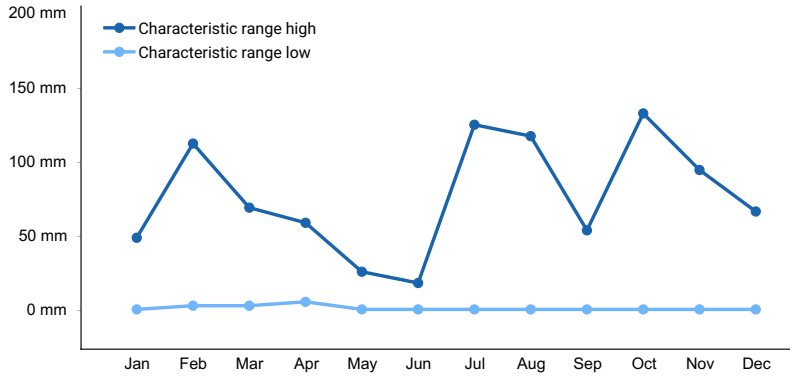

Figure 1. Monthly precipitation range

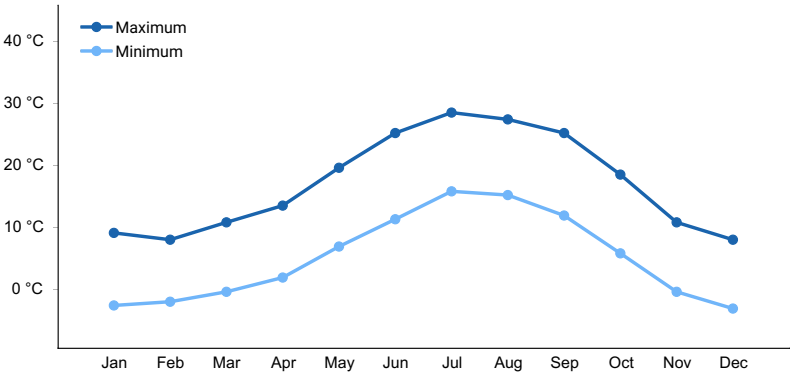

Figure 2. Monthly average minimum and maximum temperature

Influencing water features

There are no influencing water features associated with this site.

Soil features

The soils associated with this site are moderately deep to a petrocalcic horizon. Soils have formed in alluvium from limestone and dolostone. The soils are well drained, have a high runoff and moderate permeability over an impermeable layer. The soils are usually moist in late winter and spring, and periodically moist in the upper part following summer thunderstorms. The soils have an aridic bordering on ustic soil moisture regime. Soil series associated with this site are Kylecanyon.

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	51–102 cm
Surface fragment cover <=3"	60–80%
Surface fragment cover >3"	0–1%
Available water capacity (0-101.6cm)	4.83–5.08 cm
Calcium carbonate equivalent (0-101.6cm)	5–15%
Electrical conductivity (0-101.6cm)	0–2 mmhos/cm
Sodium adsorption ratio (0-101.6cm)	0
Subsurface fragment volume <=3" (Depth not specified)	50–70%
Subsurface fragment volume >3" (Depth not specified)	0–1%

Ecological dynamics

Please refer to group concept R030XC034NV to view the provisional STM.

Changes in plant composition can occur with fire, resulting in the mountain big sagebrush community being replaced by shrub species such as Stansbury's cliffrose, pointleaf manzanita, green ephedra and desert peach. In the absence of periodic wildfire, singleleaf pinyon and Utah juniper readily invade this site where it occurs adjacent to these forest areas. If pinyon and juniper tree canopies are allowed to close, they can eliminate understory vegetation. Where management results in abusive livestock use, mountain sagebrush and other shrubs may dominate this site. As ecological condition deteriorates perennial grasses and Stansbury's clifrose may decline.

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. Plants are readily killed in all seasons, even light severity fires. Mountain big sagebrush plants top-killed by fire will not resprout.
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. 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.

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. Important grasses include desert needlegrass and blue grama. Potential vegetative composition is approximately 55 percent grasses and grass-like plants, 5 percent forbs and 40 percent shrubs. Approximate ground cover (basal and canopy) is approximately 30 to 40 percent. Total annual air-dry production is 1000 pounds favorable years, 750 pounds normal years and 500 pounds unfavorable years.

Table 5. Annual production by plant type

Plant Type	Low (Kg/Hectare)	Representative Value (Kg/Hectare)	High (Kg/Hectare)
Shrub/Vine	308	460	616
Grass/Grasslike	224	336	448
Forb	28	45	56
Total	**560**	**841**	**1120**

Table 6. Ground cover

Tree foliar cover	0%
Shrub/vine/liana foliar cover	20-30%
Grass/grasslike foliar cover	10-15%
Forb foliar cover	1-5%
Non-vascular plants	0%
Biological crusts	0%
Litter	10-20%
Surface fragments >0.25" and <=3"	0-5%
Surface fragments >3"	0-1%
Bedrock	0%
Water	0%
Bare ground	40-50%

Table 7. Canopy structure (% cover)

Height Above Ground (M)	Tree	Shrub/Vine	Grass/ Grasslike	Forb
<0.15	–	1-5%	1-5%	1-2%
>0.15 <= 0.3	–	1-5%	5-10%	1-2%
>0.3 <= 0.6	–	5-30%	10-15%	–
>0.6 <= 1.4	–	30-40%	–	–
>1.4 <= 4	–	1-5%	–	–
>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**			211–420	
	desert needlegrass	ACSP12	*Achnatherum speciosum*	168–336	–
	Indian ricegrass	ACHY	*Achnatherum hymenoides*	43–84	–
2	**Secondary Perennial Grasses**			43–84	
	blue grama	BOGR2	*Bouteloua gracilis*	4–26	–
	squirreltail	ELEL5	*Elymus elymoides*	4–26	–
	needle and thread	HECO26	*Hesperostipa comata*	4–26	–
	muttongrass	POFE	*Poa fendleriana*	4–26	–
Forb					
3	**Perennial Forbs**			1–67	
	rockcress	ARABI2	*Arabis*	4–17	–
	milkvetch	ASTRA	*Astragalus*	4–17	–
	rose heath	CHER2	*Chaetopappa ericoides*	4–17	–
	cryptantha	CRYPT	*Cryptantha*	4–17	–
	hollyleaf gilia	GILA	*Gilia latiflora*	4–17	–
	lobeleaf groundsel	PAMU11	*Packera multilobata*	4–17	–
Shrub/Vine					
4	**Primary Shrubs**			211–336	
	mountain big sagebrush	ARTRV	*Artemisia tridentata ssp. vaseyana*	168–252	–
	Stansbury cliffrose	PUST	*Purshia stansburiana*	43–84	–
5	**Secondary Shrubs**			43–84	
	pointleaf manzanita	ARPU5	*Arctostaphylos pungens*	9–26	–
	mormon tea	EPVI	*Ephedra viridis*	9–26	–
	desert almond	PRFA	*Prunus fasciculata*	9–26	–
	banana yucca	YUBA	*Yucca baccata*	9–26	–

Animal community

Livestock Interpretations:
This site is suited to livestock grazing during the summer and fall. Grazing management should be keyed to dominant perennial grasses or palatable shrubs 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. 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. 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. Stansbury cliffrose is an important browse species for livestock, especially in the winter.
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:
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. Mountain big sagebrush is highly preferred and nutritious winter forage for mule deer and elk. Stansbury cliffrose is an important browse species for mule deer, pronghorn, game birds, and songbirds. Wild ungulates use it heavily in winter.
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 – Few present.
Water flow Patterns – Short, not connected.
Pedestals and/or Terracettes – Few to none.
Gullies – None present.
Shrubs and perennial grasses aid in snow catchment and infiltration.

Recreational uses

This site is used for camping, hiking and hunting.

Other products

Native peoples used big sagebrush leaves and branches for medicinal teas, and the leaves as a fumigant. Bark was woven into mats, bags and clothing.
Triterpenoids extracted from Stansbury cliffrose have been shown to have inhibitory effects on HIV and Epstein-Barr virus.
Native Americans used the inner bark for making clothing and ropes, and the branches for making arrows.

Other information

Stansbury cliffrose is recommended for wildlife, roadside, construction, and mine spoils plantings; and for restoring pinyon-juniper woodland, mountain brushland, basin big sagebrush grassland, black sagebrush, and black greasewood communities. It can be established on disturbed seedbeds by broadcast seeding, drill seeding, or transplanting. Fall or winter seeding is recommended.
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.

Type locality

Location 1: Clark County, NV	
Township/Range/Section	T19 S R57 E S27 NE
UTM zone	N
UTM northing	4014955n
UTM easting	0628507e
General legal description	Approximately 2 miles east of Deer Creek Highway and .1 mile north of Kyle Canyon Road alongside the telephone pole road.

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.

Glenne, 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:** Few present

2. **Presence of water flow patterns:** Short, not connected

3. **Number and height of erosional pedestals or terracettes:** Few to none

4. **Bare ground from Ecological Site Description or other studies (rock, litter, lichen, moss, plant canopy are not bare ground):** 15 to 30 percent

5. **Number of gullies and erosion associated with gullies:** None present

6. **Extent of wind scoured, blowouts and/or depositional areas:** No wind-scoured or blow out areas. Small depositional areas found up slope of grasses and large shrubs.

7. **Amount of litter movement (describe size and distance expected to travel):** 1 inch or less in size from water.

8. **Soil surface (top few mm) resistance to erosion (stability values are averages - most sites will show a range of values):** Soil surface somewhat resistant due to vegetation cover and litter.

9. **Soil surface structure and SOM content (include type of structure and A-horizon color and thickness):** Moderate amount of organic matter in soil. 10 to 15 percent littler cover.

10. **Effect of community phase composition (relative proportion of different functional groups) and spatial distribution on infiltration and runoff:** Low runoff due to plant cover and composition.Plant community composition contributes to infiltration.

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):**

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:**