USDA Natural Resources
Conservation Service

Ecological site R030XC040NV
STEEP NORTH SLOPE 9-11 P.Z.

Last updated: 2/25/2025
Accessed: 05/11/2025

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 north-facing sideslopes of hills and mountains. Slopes range from 25 to over 50 percent, but slope gradients from 30 to 40 percent are most typical. Elevations range from 5500 to 7000 feet. The soils associated with this site are shallow to bedrock. They formed in residuum and colluvium from dolomite and limestone.

This is a group concept and provisional STM that also covers the following sites: (R030XC045NV, R030XC046NV, R030XC025NV

Associated sites

R030XC030NV	**MOUNTAIN RIDGE**
R030XC036NV	**STEEP GRAVELLY SLOPE 9-11 P.Z.**
R030XC038NV	**SHALLOW GRAVELLY SLOPE 9-11 P.Z.**
R030XC041NV	**GRAVELLY FAN APRON 9-11 P.Z.**
R030XC045NV	**SHALLOW NORTH SLOPE 9-11 P.Z.**

Similar sites

R030XC037NV	**SHALLOW LOAM 9-11 P.Z.** ATCA2 co-dominant.
R030XC038NV	**SHALLOW GRAVELLY SLOPE 9-11 P.Z.** Lacks ARTRV, ARPU9 important grass.
R030XC034NV	**SHALLOW GRAVELLY LOAM 9-11 P.Z.** More productive site, occurs on fan remnants.
R030XC027NV	**SHALLOW GRAVELLY SANDSTONE 7-9 P.Z.** MESP2 co-dominant species, more productive site.
R030XC036NV	**STEEP GRAVELLY SLOPE 9-11 P.Z.** More productive site, PUST co-dominant.

Table 1. Dominant plant species

Tree	Not specified
Shrub	(1) *Coleogyne ramosissima* (2) *Artemisia tridentata ssp. vaseyana*
Herbaceous	(1) *Achnatherum*

Physiographic features

This site occurs on north-facing sideslopes of hills and mountains. Slopes range from 25 to over 50 percent, but slope gradients from 30 to 40 percent are most typical. Elevations range from 5500 to 7000 feet.

Table 2. Representative physiographic features

Landforms	(1) Hill (2) Mountain
Flooding frequency	None
Elevation	5,500–7,000 ft
Slope	25–50%
Aspect	N, NE, NW

Climatic features

The climate is semiarid with cold, moist winters and warm, intermittently moist summers. Precipitation is greatest in the winter, with a lesser secondary peak in the summer typical of the Mojave Desert transitional to the Great Basin. Average annual precipitation is 7 to 11 inches. Mean annual air temperature about 55 degrees F. The average growing season is about 150 to 180 days.

Table 3. Representative climatic features

Frost-free period (average)	180 days
Freeze-free period (average)	
Precipitation total (average)	11 in

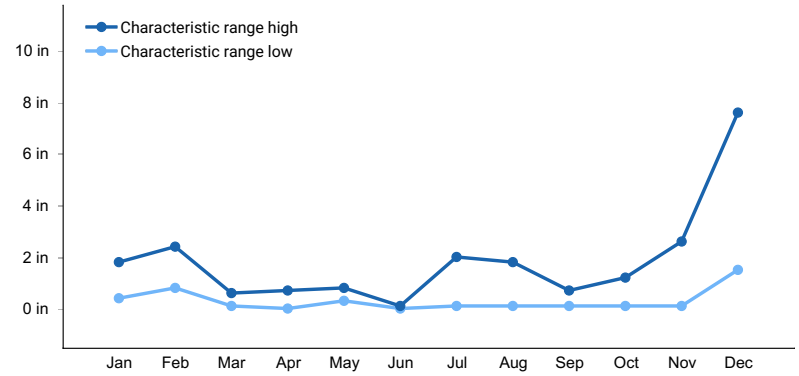


Figure 1. Monthly precipitation range

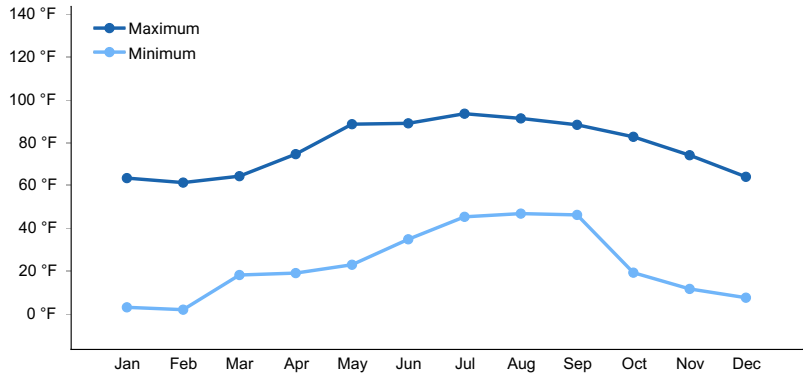


Figure 2. Monthly average minimum and maximum temperature

Influencing water features

There are no influencing water features associated with this ecological site.

Soil features

The soils associated with this site are shallow to bedrock. They formed in residuum and colluvium from dolomite and limestone. The soils are well drained and available water capacity is low. Runoff is very high and permeability is moderate. The control section averages 30 to 40 percent calcium carbonate equivalent. Reaction is strongly to moderately alkaline. The moisture regime is aridic bordering on ustic. Soil series correlated to this ecological site include Boxspring, a loamy-skeletal, carbonatic, mesic Lithic Ustic Torriorthents.

Table 4. Representative soil features

Parent material	(1) Colluvium–dolomite (2) Residuum–limestone
Surface texture	(1) Extremely gravelly loam
Family particle size	(1) Loamy
Drainage class	Well drained
Permeability class	Moderately slow
Soil depth	21–25 in
Surface fragment cover <=3"	50–70%
Surface fragment cover >3"	10–15%
Available water capacity (0-40in)	0.59–1.2 in
Calcium carbonate equivalent (0-40in)	30–60%
Electrical conductivity (0-40in)	0–4 mmhos/cm
Sodium adsorption ratio (0-40in)	0–5
Soil reaction (1:1 water) (0-40in)	7.9–8.4
Subsurface fragment volume <=3" (Depth not specified)	35–60%
Subsurface fragment volume >3" (Depth not specified)	0–15%

Ecological dynamics

Blackbrush communities are most prevalent in the transitional zone between the Mojave Desert and Great Basin. Blackbrush is a paleoendemic species as originally postulated by Stebbins and Major (1965). Blackbrush is a transitional species that occupies a boundary that has shifted in recent geologic time. Analysis of packrat middens suggests a 50–100m downward movement of the blackbrush zone along elevational gradients in the Mojave Desert (Cole and Webb, 1985; Hunter and McAuliffe, 1994).

Blackbrush is a long-lived and generally considered a climax species. It is a non-sprouter; regeneration depends on wind pollinated seed and heavy winter precipitation, and is therefore slow to re-colonize burned areas (Anderson 2001). Blackbrush recruitment is episodic, like many shrubs in arid systems, when conditions are favorable large seed crops are produced and the rest of the time is characterized by minimal seed output (Pendleton and Meyer 2004). Blackbrush seeds are frequently cached away by rodents, until conditions are conducive for germination. Typically, germination occurs during the winter and early spring, given the proper moisture conditions and cool soil temperatures (Pendleton 2008). Seeds require cold stratification before germination and the survival of seedlings following germination is dependent on the availability of spring time moisture (Pendleton 2008). On undisturbed sites, blackbrush dominates the landscape and species diversity is generally low. Undisturbed blackbrush communities are fairly resistant to invasion by non-natives (Brooks and Matchett 2003). Mature blackbrush plants

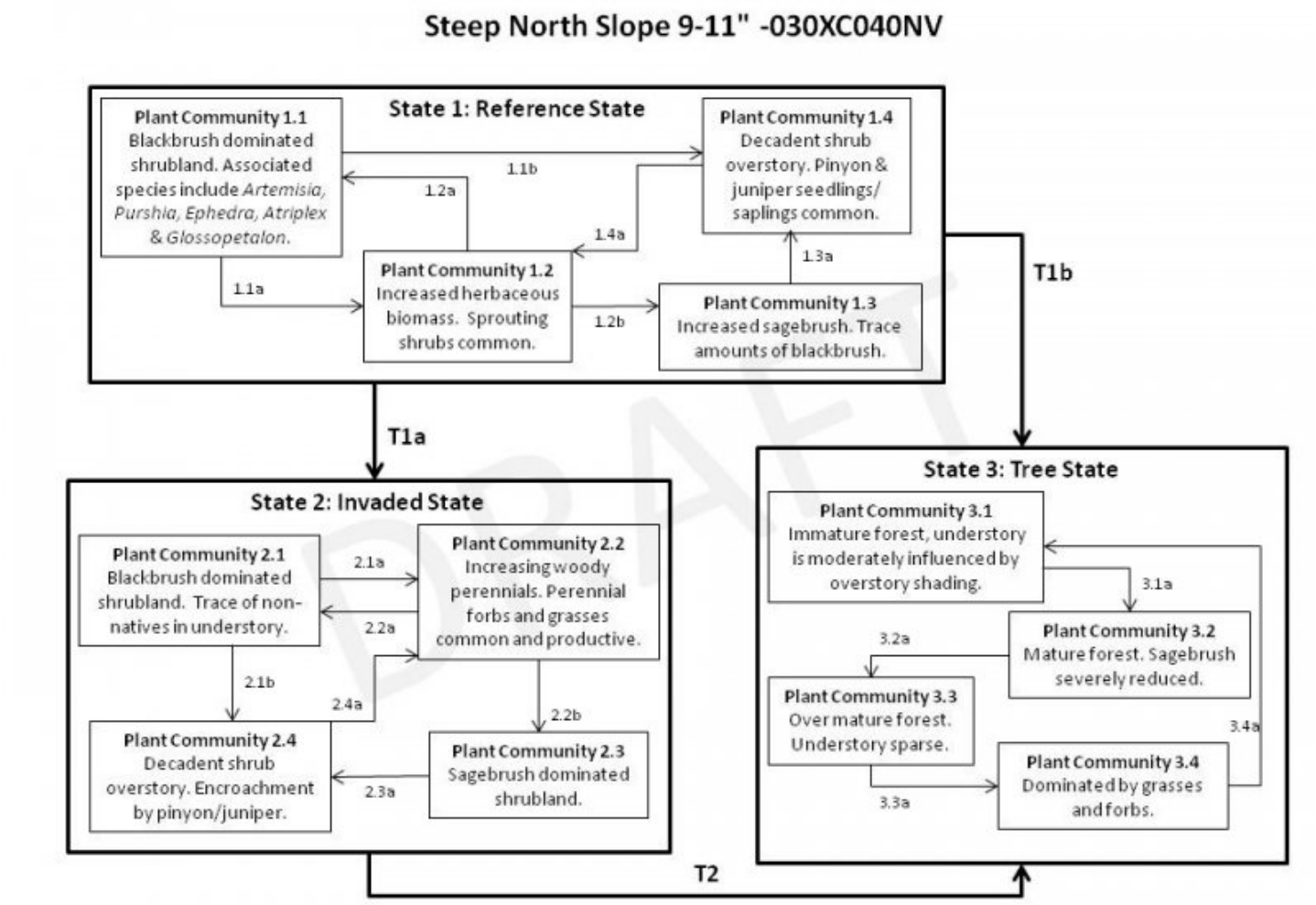
are well adapted to persist under less than optimal conditions, and individuals' may live as long as 400 years (Pendleton and Meyer 2004).

Fire Ecology:

Blackbrush stands are considered to be one of the most flammable native plant assemblages in the Mojave Desert. Fire will start and spread easily due to the close spacing nature and resinous foliage of blackbrush. During periods with high winds, low relative humidity and low fuel moisture blackbrush will experience stand replacing fires. The short-lived seed of blackbrush is readily destroyed by fire and it may take upwards of 60 years for blackbrush to achieve pre-fire conditions. There is frequently 100 percent mortality of mature blackbrush following fire (Brooks and Matchett 2003) and reestablishment occurs solely from seed. Mountain big sagebrush is highly susceptible to fire and establishes solely from seed. Nevada ephedra and Torrey's ephedra respond similarily to fire. They are generally top-killed by fire, but underground regenerative structures commonly survive. Ephedra generally sprouts after fire damages aboveground vegetation and may increase in plant cover. 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. James galleta is a rhizomatous perennial bunchgrass which can resprout after it is top-kill by fire.

Post-fire plant communities vary, depending on use history and species present prior to the fire. Post fire sprouting shrub species such as yucca, Stansbury cliffrose and ephedra increase in cover and density. Species that readily reestablish from seed such as shadscale and snakeweed also increase. Generally, non-natives increase and native species decrease post fire (Brooks and Matchett 2003). The effects of fire on blackbrush appear to be long term.

State and transition model



State 1
Reference State

The reference state is representative of the natural range of variability under pristine conditions. It is dominated by

an evergreen shrub community. Community phase changes are primarily driven by long-term drought and periodic wildfire. Historically, blackbrush associations were long-lived stable communities that rarely experienced fire. Plant community phase changes were primarily driven by long term drought. Fire was infrequent and patchy due to low fuel loading. Reproduction and recruitment are episodic, based on favorable environmental conditions (Pendleton and Meyer 2004). Very old stands of blackbrush may have established hundreds to thousands of years ago under very different climatic conditions and will take a considerable amount of time to recover following disturbances.

Community 1.1
Reference Plant Community

Figure 3. reference plant community

This plant community is characteristic of the upper elevational limit occupied by blackbrush. The reference plant community is dominated by blackbrush. Mountain big sagebrush, Indian ricegrass, and needlegrasses are other important species associated with this site. Potential vegetative composition by weight is about 15 percent grasses, 10 percent annual and perennial forbs and 75 percent shrubs and trees. Approximate ground cover (basal and crown) is 20 to 35 percent. This plant community can persist under undisturbed conditions for extended periods of time.

Table 5. Annual production by plant type

Plant Type	Low (Lb/Acre)	Representative Value (Lb/Acre)	High (Lb/Acre)
Shrub/Vine	186	260	370
Grass/Grasslike	37	52	75
Forb	25	35	50
Tree	2	3	5
Total	**250**	**350**	**500**

Community 1.2
Plant Community 1.2

This plant community is characteristic of a post-disturbance plant community and is initially heavily dominated by herbaceous vegetation. Sprouting shrubs recover quickly following a disturbance and provide favorable conditions for the establishment of other shrub seedlings, including blackbrush and mountain big sagebrush. Composition of post-fire plant community may vary depending on season of burn. Fast-moving, low-intensity fires result in the incomplete removal of blackbrush and sagebrush allowing for direct reestablishment. This plant community is ‘at-risk’ of invasion by non-native annuals, like red brome, cheatgrass and red stem filaree. Non-natives take advantage of increased availably of critical resources following a disturbance. Invasion of non-natives will cause this plant community to cross a biotic threshold into state 2.

Community 1.3
Plant Community 1.3

This plant community is characterized by dominance of mountain big sagebrush. Natural succession post fire may result in dominance by big sagebrush, blackbrush is present in trace amounts. Blackbrush establishes solely from seed and is characterized by pulse recruitment pattern dependant on ideal climatic conditions. This ecological site is near the elevational limit for blackbrush communities, sagebrush readily establishes in this zone and is capable of replacing blackbrush if climatic patterns are conducive.

Community 1.4
Plant Community 1.4

This plant community is characterized by encroachment of pinyon and juniper and loss of other structural and functional groups. This community phase is identified as ‘at-risk’, total tree cover is near 20 percent and without fire or other disturbance tree cover will increase. The at-risk community phase is in danger of crossing an irreversible biotic threshold to state 3. Management options to keep this community phase from crossing a threshold include cutting trees and reducing dominance by woody vegetation.

Pathway 1.1a
Community 1.1 to 1.2

Wildfire, prolonged drought and/or insect/disease attack.

Pathway 1.1b
Community 1.1 to 1.4

Natural regeneration over time and encroachment of pinyon and juniper trees. This ecological site is at higher risk of pinyon-juniper invasion when it is located near a woodland. Invasion may occur with out previous disturbance in some cases.

Pathway 1.2a
Community 1.2 to 1.1

Absence from disturbance and natural regeneration over time. Regeneration of blackbrush is dependent on nearby seed source and favorable climatic conditions. Recovery of blackbrush to pre-fire conditions can >60 years.

Pathway 1.2b
Community 1.2 to 1.3

Natural regeneration over time, changes in climatic patterns allows mountain big sagebrush to replace blackbrush as the dominant species.

Pathway 1.3a
Community 1.3 to 1.4

Absence of fire and other natural disturbance. Without fire shrubs become over mature and decadent. Lack of disturbance allows tree seedlings to encroach into the plant community.

Pathway 1.4a
Community 1.4 to 1.2

Large scale disturbance such as fire removes decadent shrub cover, tree seedlings and saplings and encourages growth of perennial bunchgrasses. Non-natives may increase post fire.

State 2
Invaded State

The invaded state is characterized by the presence of non-native species. A biotic threshold is crossed, with the introduction of non-natives that are difficult to remove from the system and have the potential to alter disturbance

regimes significantly from their natural range of variability. Introduced annuals such as red brome, cheatgrass and redstem filaree have invaded the reference plant community. These non-natives annuals are highly flammable and promote wildfires where fires historically have been infrequent. Following a disturbance this state relies on the availability of a nearby seed source.

Community 2.1
Invaded Plant Community 2.1

Compositionally and functionally this plant community is similar to the reference plant community with the presence of non-native species in the understory. Ecological processes are not compromised at this time. The presence of non-natives does reduce the ecological resilience of the site and this site will respond differently following a disturbance when compared to the reference plant community. Management focused on reducing disturbances and protecting native vegetation is important for maintaining the health of perennial native species and protecting the site from further degradation.

Community 2.2
Invaded Plant Community 2.2

This plant community is characterized by a post-fire plant community and is initially heavily dominated by herbaceous vegetation. Shrubs capable of sprouting and those that readily establish from seed quickly return. Sprouting species, such as ephedra and yucca are the first to achieve dominance. Blackbrush and sagebrush reestablish provided favorable climatic conditions and available seed source. Fast-moving, low-intensity fires result in the incomplete removal of blackbrush and sagebrush allowing for direct reestablishment. Abundance of non-native biomass varies annual depending on weather. Droughty conditions can favor native perennials and decrease abundance of non-natives. Post-fire plant communities vary in response to the season of burn.

Community 2.3
Invaded Plant Community 2.3

This plant community is characterized by dominance of mountain big sagebrush. Natural succession post fire may result in dominance by big sagebrush, blackbrush is present in trace amounts. Blackbrush establishes solely from seed and is characterized by pulse recruitment pattern dependant on ideal climatic conditions. This ecological site is near the elevational limit for blackbrush communities, sagebrush readily establishes in this zone and is capable of replacing blackbrush if climatic patterns are conducive. Non-native species remain in plant community.

Community 2.4
Invaded Plant Community 2.4

This plant community is characterized by an increase of pinyon and juniper trees. Total tree cover is near 20 percent and seedlings and saplings are prevalent in the plant community. This community phase is identified as ‘at-risk’, without fire or other disturbance tree cover will increase. The at-risk community phase is in danger of crossing an irreversible biotic threshold to state 3. Management options to keep this community phase from crossing a threshold include cutting trees and reducing dominance by woody vegetation and encouraging growth of perennial bunchgrasses.

Pathway 2.1a
Community 2.1 to 2.2

Wildfire, prolonged drought and/or disease/insect attack.

Pathway 2.1b
Community 2.1 to 2.4

Natural regeneration over time and absence from disturbance.

Pathway 2.2a

Community 2.2 to 2.1

Absence from disturbance and natural regeneration over time. Regeneration of black brush is dependent on nearby seed source and favorable climatic conditions. Recovery of blackbrush to pre-fire conditions can >60 years.

Pathway 2.2b
Community 2.2 to 2.3

Natural regeneration over time, changes in climatic patterns allows mountain big sagebrush to replace blackbrush as the dominant species.

Pathway 2.3a
Community 2.3 to 2.4

Absence of disturbance and natural regeneration over time.

Pathway 2.4
Community 2.4 to 2.2

Wildfire, prolonged drought and/or insect/disease attack.

State 3
Tree State

The tree state is characterized by an increase of pinyon-juniper and tree cover greater than 20 percent. Lack of fire and other disturbance allows seedlings and saplings to infill and eventually dominate, changing the ecological dynamics of the site. Non-native annuals may or may not be present in the understory. This state experiences reduced infiltration and increased runoff during precipitation events, diminishing soil moisture. Feedbacks contributing to the stability of this state include reduced understory vegetation resulting from decreased soil moisture and overstory shading.

Community 3.1
Plant Community 3.1

This plant community is characterized by an immature forest, trees constitute more than half of the plant community. Understory vegetation is moderately affected by overstory shading. Shrubs and grasses are decreasing. Non-natives may or may not be present in understory. Tree canopy is greater than 20 percent.

Community 3.2
Plant Community 3.2

This plant community is characterized by pinyon and juniper trees that have reached or are near maximal height for the site. Remaining understory vegetation is strongly influenced by overstory shading, competition, duff accumulation, etc. Dead shrubs are common in understory, perennial grasses and forbs are severely reduced or even absent. Non-native species may or may not be present. Tree canopy ranges from 30-50 percent.

Community 3.3
Plant Community 3.3

This plant community is dominated by an over mature forest. Upper crowns of dominant trees are normally flat topped or rounded. Without disturbance, the trees on this site become very old. Understory herbaceous production is greatly reduced or even absent to tree competition and overstory shading, tree canopy is generally greater than 50 percent. Surface erosion is common and bare ground is dominant. Non-natives are able to survive dense canopy cover, if present in plant community.

Community 3.4
Plant Community 3.4

This community phase is dominated by grasses and forbs under full sunlight. Standing snags remaining after disturbance have little to no effect on the composition and production of the herbaceous vegetation. Sprouting shrubs and those that readily establish from seed are the first to appear. Long lived perennials and late successional species will colonize the site, given protection from large scale disturbance or abusive management. Increase availability of critical resources following wildfire may result in increased non-natives biomass.

Pathway 3.1a
Community 3.1 to 3.2

Absence of disturbance and continued infilling by pinyon and juniper. Bare ground increasing.

Pathway 3.2a
Community 3.2 to 3.3

Absence from disturbance and natural regeneration over time. Leading to a closed canopy.

Pathway 3.3a
Community 3.3 to 3.4

Wildfire, prolonged drought and/or insect/disease attack.

Pathway 3.4a
Community 3.4 to 3.1

Absence from disturbance and natural regeneration over time. Seedling and saplings begin to encroach from neighboring sites.

Transition T1
State 1 to 2

Introduction of non-natives due to anthropogenic disturbances including recreation, linear corridors, military operations and historic mining and grazing.

Transition T1a
State 1 to 2

Introduction of non-native species due to a combination of factors including: 1) surface disturbance, 2) changes in the kinds of animals and their grazing patterns, 3) drought and/or 4) changes in fire history.

Transition T1b
State 1 to 3

Continued lack of disturbance. Encroachment and establishment of pinyon and juniper. Tree canopy is greater than 20 percent and bare ground is increasing.

Transition T2
State 2 to 3

Continued lack of disturbance. Encroachment and establishment of pinyon and juniper. Tree canopy is 20 percent or greater and bare ground is increasing.

Additional community tables

Table 6. Community 1.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production (Lb/Acre)	Foliar Cover (%)
Grass/Grasslike					

1	**Primary Perennial Grasses**			37–75	
	Indian ricegrass	ACHY	*Achnatherum hymenoides*	18–35	–
	desert needlegrass	ACSP12	*Achnatherum speciosum*	9–18	–
	Mormon needlegrass	ACAR14	*Achnatherum aridum*	9–18	–
2	**Secondary Perennial Grasses**			7–28	
	blue grama	BOGR2	*Bouteloua gracilis*	1–7	–
	squirreltail	ELEL5	*Elymus elymoides*	1–7	–
	James' galleta	PLJA	*Pleuraphis jamesii*	1–7	–
	muttongrass	POFE	*Poa fendleriana*	1–7	–
	Sandberg bluegrass	POSE	*Poa secunda*	1–7	–
3	**Annual Grasses**			1–7	
	sixweeks fescue	VUOC	*Vulpia octoflora*	1–7	–
Forb					
4	**Perennial Forbs**			25–50	
	Indian paintbrush	CASTI2	*Castilleja*	1–7	–
	desert frasera	FRAL5	*Frasera albomarginata*	1–7	–
	Cooper's rubberweed	HYCO2	*Hymenoxys cooperi*	1–7	–
	hoary tansyaster	MACA2	*Machaeranthera canescens*	1–7	–
	desert globemallow	SPAM2	*Sphaeralcea ambigua*	1–7	–
5	**Annual Forbs**			1–18	
Shrub/Vine					
6	**Primary Shrubs**			123–193	
	blackbrush	CORA	*Coleogyne ramosissima*	105–140	–
	mountain big sagebrush	ARTRV	*Artemisia tridentata ssp. vaseyana*	18–53	–
7	**Secondary Shrubs**			16–64	
	black sagebrush	ARNO4	*Artemisia nova*	1–11	–
	fourwing saltbush	ATCA2	*Atriplex canescens*	1–11	–
	Nevada jointfir	EPNE	*Ephedra nevadensis*	1–11	–
	mormon tea	EPVI	*Ephedra viridis*	1–11	–
	Apache plume	FAPA	*Fallugia paradoxa*	1–11	–
	spiny greasebush	GLSP	*Glossopetalon spinescens*	1–11	–
	threadleaf snakeweed	GUMI	*Gutierrezia microcephala*	1–11	–
	broom snakeweed	GUSA2	*Gutierrezia sarothrae*	1–11	–
	spiny menodora	MESP2	*Menodora spinescens*	1–11	–
	Stansbury cliffrose	PUST	*Purshia stansburiana*	1–11	–
	purple sage	SADO4	*Salvia dorrii*	1–11	–
	banana yucca	YUBA	*Yucca baccata*	1–11	–
	Joshua tree	YUBR	*Yucca brevifolia*	1–11	–
	grizzlybear pricklypear	OPPOE	*Opuntia polyacantha var. erinacea*	1–4	–
Tree					
8	**Evergreen**			1–4	
	Utah juniper	JUOS	*Juniperus osteosperma*	1–2	–
	singleleaf pinyon	PIMO	*Pinus monophylla*	1–2	–

Animal community

Livestock interpretations: This site has limited value for livestock grazing, due to low forage production and distance from adequate water resources. Grazing management should be keyed to dominant perennial grasses. Indian ricegrass benefits from moderate grazing use in winter and early spring. Inappropriate season of grazing may sharply reduce vigor of decrease overall cover. Indian ricegrass is high palatable to all classes of livestock in both the green and cured condition. Blackbrush is economically important forage in the winter especially for domestic sheep. It is considered poor forage during the spring, summer and fall for domestic cattle, horses and sheep. Nevada ephedra is also highly important winter forage for domestic cattle, sheep and goats. It is generally heavily grazed without inducing toxicity in ewes or cows. Mountain big sagebrush is unpalatable to domestic livestock, but is used if little else is available. Stocking rates vary over time depending upon season of use, climate variation, 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: A variety of wildlife species find valuable foraging and habitat resources on this ecological site. Indian ricegrass is eaten by pronghorn when available. It is also the preferred seed of a variety of rodents and small mammals. Indian ricegrass makes up a significant portion of jackrabbit diets in the spring and summer. It also provides seed for many species of birds. Blackbrush provides an important winter browsing resource for several species of wildlife, including mule deer and bighorn sheep. Mountain big sagebrush is desirable winter forage for mule deer and elk. Nevada ephedra is browsed by mule deer, bighorn sheep and pronghorn in the spring to late summer when new growth is available.

Hydrological functions

The soils associated with this site are characterized very high runoff and moderately slow permeability.

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 for photography and nature study. This site is used for camping and hiking and has potential for upland and big game hunting.

Other products

Native Americans used big sagebrush leaves and branches for medicinal teas, and the leaves as a fumigant. Bark was woven into mats, bags and clothing. As the name suggests, the highly nutritious seed of Indian ricegrass was one of the staple foods of Native American. Banana yucca was used by Native Americans as a food source. Fruits were consumed raw before fully ripening. Cakes were also made by pit roasting the fruits, grinding them into a paste, and drying the resulting material. Fermented banana yucca has been used for beverages, its juices used as a preservative, its seeds dried and ground into a meal and the central leaves were incorporated into soups and meat dishes.

Other information

Indian ricegrass is well adapted to stabilization of disturbed sandy soils and is especially valuable for controlling wind erosion. It is well suited for reclamation projects in areas receiving 8 to 14 inches annual precipitation.

Type locality

Location 1: Clark County, NV	
Township/Range/Section	T14S R61E S24
UTM zone	N
UTM northing	4063405
UTM easting	670254
Latitude	36° 42′ 3″
Longitude	115° 5′ 38″

General legal description	Approximately 1.2 miles from the head of Sawmill Canyon, eastside of Sheep Range, Desert National Wildlife Refuge. Mormon Well 7.5 minute topographic quadrangle.

Other references

Anderson, Michelle D. 2001. Coleogyne ramosissima. In: Fire Effects Information System, [Online]. U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station, Fire Sciences Laboratory (Producer). Available: http://www.fs.fed.us/database/feis/ [2011, August 16].
Brooks, M.L. and J.R. Matchett. 2003. Plant community patterns in unburned and burned blackbrush (Coleogyne ramosissima Torr.) shrublands in the Mojave Desert. Western North American Naturalist. 63.3: 283-298.
Cole, K.L., and Webb, R.H. 1985. Late Holocene vegetation changes in Greenwater Valley, Mojave Desert, California, Quaternary Research. 23. 2: 227-235.
Fire Effects Information System (Online; http://www.fs.fed.us/database/feis/plants/).
Hunter, K.L. and J.R. McAuliffe. 1994. Elevational shifts of Coleogyne ramosissima in the Mojave Desert during the Little Ice Age. Quaternary Research. 42. 2: 216-221.
Pendleton, B.K. and S.E. Meyer. 2004. Habitat-correlated variation in blackbrush (Coleogyne ramosissima : Rosaceae) seed germination response. J. of Arid Environments. 59: 229-243.
Pendleton, B.K. 2008. Coleogyne ramosissima Torr. Available: http://www.nsl.fs.fed.us.wpsm/index.html
USDA-NRCS Plants Database (Online; http://www.plants.usda.gov).

Contributors

E. Hourihan
PN-E

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)	E.Hourihan/P.Novak-Echenique
Contact for lead author	State Rangeland Management Specialist
Date	11/16/2011
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. A few (< 3 ft) can be expected on steeper slopes in areas recently subjected to summer convection storms or rapid

---

2. **Presence of water flow patterns:** Water flow patterns (short <3 ft, not connected) are none to rare but can be expected on steeper slopes in areas recently subjected to summer convection storms or rapid snowmelt.

3. **Number and height of erosional pedestals or terracettes:** None

4. **Bare ground from Ecological Site Description or other studies (rock, litter, lichen, moss, plant canopy are not bare ground):** Bare Ground 2-10% depending on amount of surface rock fragments

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

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 large 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. (To be field tested.)

9. **Soil surface structure and SOM content (include type of structure and A-horizon color and thickness):** Surface structure is typically weak thin platy that parts to moderate very fine subangular blocky. Soil surface colors are pale brown and soils are typified by a ochric epipedon. Organic matter of the surface 2 to 4 inches is typically 1.0 to 1.5 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., Indian ricegrass] 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 none. Subangular blocky or massive sub-surface horizons are not to be interpreted as compacted.

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: Reference Plant Community: Evergreen shrubs (blackbrush & big sagebrush)>>

    Sub-dominant: Deep-rooted, cool season, perennial bunchgrasses> associated shrubs>shallow-rooted, cool season, perennial grasses>deep-rooted, cool season, perennial forbs>shallow-rooted, warm-season perennial grasses>fibrous, shallow-rooted, cool season, perennial and annual forbs.

Other: Succulents, evergreen trees

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 (<10%) have dead centers.

---

14. **Average percent litter cover (%) and depth (in):** Between plant interspaces and under canopy 20-35% and litter depth is ± ¼ inch.

---

15. **Expected annual annual-production (this is TOTAL above-ground annual-production, not just forage annual-production):** For normal or average growing season (through mid-June) ± 350 lbs/ac; favorable years 500 lbs/ac, unfavorable years 250 lbs/ac

---

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:** Potential invaders include red brome and redstem filaree.

---

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

---