Ecological site R030XB010NV
LOAMY SLOPE 5-7 P.Z.

Last updated: 2/18/2025
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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 mountain sideslopes and are generally on steep south facing slopes. Slopes range from 15 to 50 percent. Elevations are 3800 to 4500 feet.

Please refer to group concept R030XB076NV to view the provisional STM.

Table 1. Dominant plant species

Tree	Not specified
Shrub	(1) *Atriplex confertifolia* (2) *Ephedra nevadensis*
Herbaceous	(1) *Achnatherum speciosum* (2) *Achnatherum hymenoides*

Physiographic features

This site occurs on mountain sideslopes and are generally on steep south facing slopes. Slopes range from 15 to 50 percent. Elevations are 3800 to 4500 feet.

Table 2. Representative physiographic features

Landforms	(1) Mountain
Elevation	3,800–4,500 ft
Slope	15–50%
Aspect	Aspect is not a significant factor

Climatic features

The climate is hot and arid, with mild winters and very hot summers. Precipitation is greatest in the winter with a lesser secondary peak in summer, typical of the Mojave Desert. Average annual precipitation is 5 to 7 inches. Mean annual air temperature is 60 to 65 degrees F. The average growing season is about 180 to 220 days.

Table 3. Representative climatic features

Frost-free period (average)	220 days
Freeze-free period (average)	
Precipitation total (average)	7 in

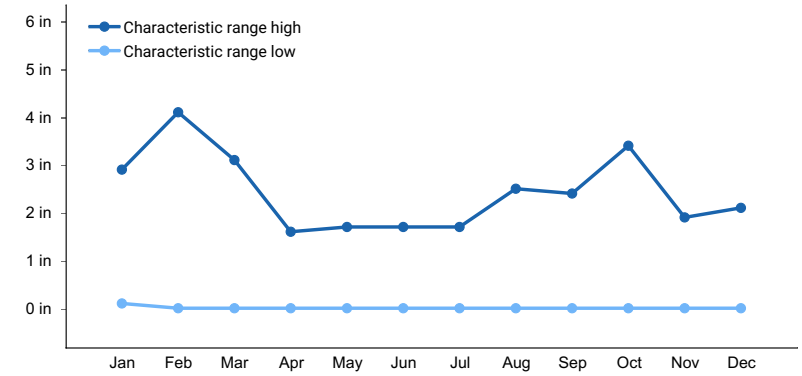

Figure 1. Monthly precipitation range

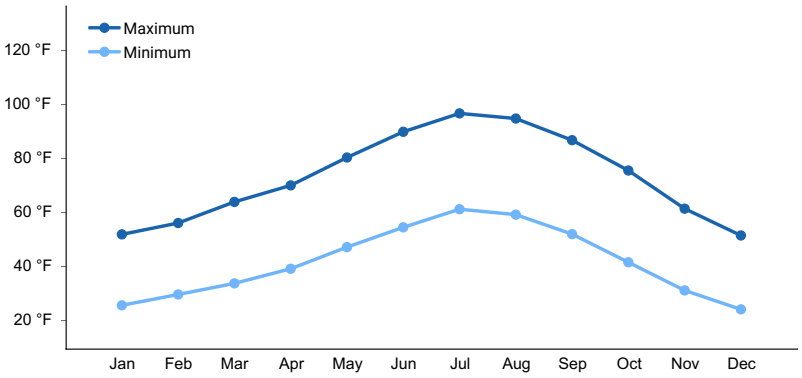

Figure 2. Monthly average minimum and maximum temperature

Influencing water features

There are no influencing water features associated with this site.

Soil features

The soils associated with this site are shallow and have formed in colluvium from mixed parent material. Runoff is very high and permeability is moderate. Available water holding capacity is very low. The soil series associated with this site include: Akela.

Table 4. Representative soil features

Surface texture	(1) Very stony sandy loam (2) Very gravelly fine sandy loam (3) Extremely gravelly fine sandy loam
Family particle size	(1) Loamy
Drainage class	Well drained
Permeability class	Moderate
Soil depth	10–20 in
Surface fragment cover <=3"	24–70%
Surface fragment cover >3"	2–10%
Available water capacity (0-40in)	0.7–0.8 in
Calcium carbonate equivalent (0-40in)	5–15%
Electrical conductivity (0-40in)	0–2 mmhos/cm

Sodium adsorption ratio (0-40in)	1–5
Soil reaction (1:1 water) (0-40in)	7.4–8.4
Subsurface fragment volume <=3" (Depth not specified)	24–70%
Subsurface fragment volume >3" (Depth not specified)	2–17%

Ecological dynamics

Please refer to group concept R030XB076NV to view the provisional STM.

As ecological condition deteriorates with abusive grazing management, shadscale increases as winterfat and perennial grasses decrease. Following wildfire, snakeweed and ephedra greatly increase. Species likely to invade this site are annual forbs and grasses.

Fire Ecology:
Shadscale communities are usually unaffected by fire because of low fuel loads, although a year of exceptionally heavy winter rains can generate fuels by producing a heavy stand of annual forbs and grasses. The mean fire return interval for shadscale communities range from 35 to 100 years. Increased presence of non-native annual grasses, such as cheatgrass, can alter fire regimes by increasing fire frequency under wet to near-normal summer moisture conditions. Nevada ephedra is top-killed by fire. Underground regenerative structures commonly survive when aboveground vegetation is consumed by fire. Nevada ephedra generally sprouts after fire damages aboveground vegetation and may increase in plant cover. Winterfat is either killed or top-killed by fire, depending on fire severity. Severe fire can kill the perennating buds located several inches above the ground surface and thus kills the plant. In addition, severe fire usually destroys seed on the plant. Low-severity fire scorches or only partially consumes the aboveground portions of winterfat and thus does not cause high mortality. 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 and surviving tufts will resprout. 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. Fire most likely top-kills big galleta. Big galleta sprouts from rhizomes following fire. Damage to big galleta from fire varies, depending on whether big galleta is dormant when burned. If big galleta is dry, damage may be severe. However, when plants are green, fire will tend to be less severe and damage may be minimal, with big galleta recovering quickly. Bush muhly regenerates following fire from soil-stored seed. Fire probably top-kills bush muhly. Burning causes at least short-term decline of bush muhly. Recovery time is thought to vary considerably and is probably dependent on postfire weather and competition.

State and transition model

Ecosystem states

1. Reference State

2. Invaded

State 1 submodel, plant communities

1.1. Reference Plant Community

State 1
Reference State

Community 1.1
Reference Plant Community

The reference plant community is dominated by desert needlegrass, Indian ricegrass, shadscale and Nevada ephdra. Bush muhly, big galleta, and winterfat are other important species on this site. Potential vegetative composition is about 60% grasses, 5% forbs and 35% shrubs. Approximate ground cover (basal and crown) is 10 to 20 percent.

Table 5. Annual production by plant type

Plant Type	Low (Lb/Acre)	Representative Value (Lb/Acre)	High (Lb/Acre)
Grass/Grasslike	240	360	480
Shrub/Vine	140	210	280
Forb	20	30	40
Total	**400**	**600**	**800**

State 2
Invaded

Introduced annuals such as red brome, schismus and redstem stork's bill have invaded the reference plant community and have become a dominant component of the herbaceous cover. This invasion of non-natives is attributed to a combination of factors including: 1) surface disturbances, 2) changes in the kinds of animals and their grazing patterns, 3) drought, and 4) changes in fire history. These non-natives annuals are highly flammable and promote wildfires where fires historically have been infrequent. ATCO and EPNE would persist after this invasion by non-native annuals, but the other shrubs and desirable grasses would either be unsuccessful in competing with the non-natives or removed from the system. The threshold that is crossed, is the introduction of non-native annuals that cannot be removed from the system and will alter disturbance regimes significantly from their natural or historic range of disturbances.

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**			294–420	
	desert needlegrass	ACSP12	*Achnatherum speciosum*	240–300	–
	Indian ricegrass	ACHY	*Achnatherum hymenoides*	30–60	–
	bush muhly	MUPO2	*Muhlenbergia porteri*	12–30	–
	big galleta	PLRI3	*Pleuraphis rigida*	12–30	–
2	**Secondary Perennial grasses**			12–48	
	low woollygrass	DAPU7	*Dasyochloa pulchella*	3–18	–
	squirreltail	ELEL5	*Elymus elymoides*	3–18	–
	slim tridens	TRMU	*Tridens muticus*	3–18	–
Forb					
3	**Perennial forbs**			12–48	
	woolly desert marigold	BAPL3	*Baileya pleniradiata*	3–18	–
	desert princesplume	STPI	*Stanleya pinnata*	3–18	–
4	**Annual forbs**			1–18	
Shrub/Vine					
5	**Primary shrubs**			144–240	
	shadscale saltbush	ATCO	*Atriplex confertifolia*	60–90	–
	Nevada jointfir	EPNE	*Ephedra nevadensis*	60–90	–
	winterfat	KRLA2	*Krascheninnikovia lanata*	12–30	–
	Fremont's dalea	PSFR	*Psorothamnus fremontii*	12–30	–
6	**Secondary shrubs**			30–90	
	Bigelow sage	ARBI3	*Artemisia bigelovii*	6–30	–
	fourwing saltbush	ATCA2	*Atriplex canescens*	6–30	–
	brittlebush	ENCEL	*Encelia*	6–30	–
	threadleaf snakeweed	GUMI	*Gutierrezia microcephala*	6–30	–
	prickleleaf	HESH	*Hecastocleis shockleyi*	6–30	–

Animal community

Livestock Interpretations:
This site has limited value for livestock grazing, due to steep slopes and stony surfaces. Desert needlegrass may be eliminated from areas with a high concentration of grazing animals due to excessive trampling and overgrazing. On disturbed sites, desert needlegrass quickly reestablishes. Indian ricegrass benefits from grazing use if it is moderately grazed in winter and early spring. Heavy early spring grazing may sharply reduce the vigor of Indian ricegrass and decrease the stand. Big galleta is a coarse, nearly woody perennial bunchgrass that is considered to have only fair forage value for cattle and horses. Bush muhly can be very susceptible to heavy winter grazing when it is green and other plants are scarce. When growing beneath shrubs, the shrubs may provide some protection from large herbivores. Shadscale provides good browse for domestic sheep and goats. Shadscale leaves and seeds are an important component of domestic sheep and cattle winter diets. Shadscale tends to be browse tolerant. Heavy grazing during the winter and/or spring reduces shadscale. Die-off can also occur during extended periods of high precipitation. Shadscale is tolerant of early spring light-intensity browsing. Nevada ephedra is important winter range browse for domestic cattle, sheep and goats. Winterfat is an important forage plant for livestock. Winterfat palatability is rated as good for sheep, good to fair for horses, and fair for cattle. Abusive grazing practices have reduced or eliminated winterfat on some areas even though it is fairly resistant to browsing. Grazing season has more influence on winterfat than grazing intensity. Early winter grazing may actually be beneficial.

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:
Shadscale is a valuable browse species providing a source of palatable, nutritious forage for a wide variety of wildlife. The fruits and leaves are a food source for deer, desert bighorn sheep and pronghorn antelope. Mule deer, bighorn sheep, and pronghorn browse Nevada ephedra, especially in spring and late summer when new growth is available. Mountain quail eat ephedra seeds. Winterfat is an important forage plant for wildlife in salt-desert shrub rangeland and subalkaline flats. Animals that browse winterfat include mule deer, desert bighorn sheep, and pronghorn antelope. Desert bighorn sheep and feral horses and burros will graze desert needlegrass. Indian ricegrass is eaten by pronghorn in moderate amounts whenever available. In Nevada it is consumed by desert bighorns. 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. In Nevada, Indian ricegrass may even dominate jackrabbit diets during the spring through early summer months. 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. The palatability of bush muhly for wildlife species is rated fair to poor.

Hydrological functions

Runoff is very high. Permeability is moderate.

Other products

Seeds of shadscale were used by Native Americans for bread and mush. Some Native American tribes steeped the twigs of Nevada ephedra and drank the tea as a general beverage. Indian ricegrass was traditionally eaten by some Native Americans. The Paiutes used seed as a reserve food source.

Other information

Big galleta's clumped growth form stabilizes blowing sand. Desert needlegrass may be used for groundcover in areas of light disturbance, but it is susceptible to excessive trampling.

Type locality

Location 1: Lincoln County, NV	
Township/Range/Section	T6S R61E S22
General legal description	Approximately 2 miles north of Alamo and about 2 miles east of US Highway 93 toward Hiko Range, Lincoln County, Nevada. This site also occurs in Clark and southern Lincoln Counties, 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

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BO'D

Approval

Kendra Moseley, 2/18/2025

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 Range Management Specialist
Date	07/20/2012
Approved by	Kendra Moseley
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 rills can be expected on steeper slopes in areas recently subjected to summer convection storms.

2. **Presence of water flow patterns:** Water flow patterns are none to rare but can be expected in areas recently subjected to summer convection storms, usually on steeper slopes

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 is ± 15% 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 rainfall 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 1 to 4 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 massive. Soil surface colors are light and soils are typified by an ochric epipedon. Organic matter of the surface 2 to 3 inches is typically less than 1%. Organic matter content can be more or less depending on micro-topography.

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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 canopy and associated litter break raindrop impact.

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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):** Compacted layers are none. Massive sub-surface horizons are not to be interpreted as compacted layers.

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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: Deep-rooted, cool-season perennial bunchgrasses

    Sub-dominant: salt-desert shrubs > warm-season perennial bunchgrasses > perennial forbs > annual forbs

    Other:

    Additional:

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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.

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14. **Average percent litter cover (%) and depth (in):** Under canopy and in interspaces 15-25% and depth of litter is <½ 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 ± 250 lbs/ac. Favorable years ~800 lbs/ac and unfavorable years ~400 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:** Potential invaders on this site include red brome, red stem filaree, annual mustards, and Mediterranean grass.

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