USDA Natural Resources
Conservation Service

Ecological site R030XB035NV
SANDY LOAM 5-7 P.Z.

Last updated: 3/11/2025
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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 fan skirts and fan remnants. Slopes range from 0 to 4 percent. Elevations are 2600 to 3400 feet.

Please refer to group concept R030XB230CA to view the provisional STM.

Similar sites

R030XB032NV	**DRY FLOODPLAIN** more productive site; PLRI3 dominant grass
R030XB063NV	**SANDHILL 5-7 P.Z.** ACHY-PLRI3 codominant
R030XB033NV	**SANDY PLAIN 7-9 P.Z.** BOER4 major species
R030XB034NV	**SANDY PLAIN 5-7 P.Z.** more productive site; PLRI3 dominant grass
R030XB039NV	**LIMY FAN 5-7 P.Z.** less productive site; occurs on inset fans
R030XB054NV	**SANDY 3-5 P.Z.** less productive site; MUPO2 absent
R030XB121NV	**SANDY PLAIN 3-5 P.Z.** MUPO2 absent to rare
R030XB004NV	**SANDY 5-7 P.Z.** ATCA2 minor species

Table 1. Dominant plant species

Tree	Not specified
Shrub	(1) *Atriplex canescens*
Herbaceous	(1) *Pleuraphis rigida* (2) *Achnatherum hymenoides*

Physiographic features

This site occurs on fan skirts and fan remnants. Slopes range from 0 to 4 percent. Elevations are 2600 to 3400 feet.

Table 2. Representative physiographic features

Landforms	(1) Fan remnant (2) Fan skirt
Flooding duration	Very brief (4 to 48 hours) to extremely brief (0.1 to 4 hours)
Flooding frequency	Very rare to rare
Ponding frequency	None
Elevation	2,600–3,400 ft
Slope	0–4%
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 56 to 60 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)	7 in

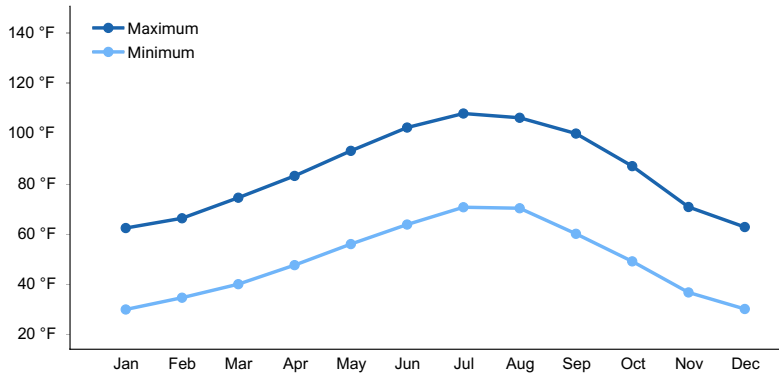

Figure 1. Monthly average minimum and maximum temperature

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 very deep and formed in mixed alluvium from mixed parent material. Water intake rates are moderately slow to moderate, available water holding capacity is low to moderate, runoff is very low to high, and soils are well drained. Potential for sheet or rill erosion is slight. The soil series associated with this site include: Aymate and Grapevine.

Table 4. Representative soil features

Surface texture	(1) Sandy loam (2) Gravelly clay loam (3) Gravelly loamy sand
Family particle size	(1) Loamy
Drainage class	Well drained

Permeability class	Moderately slow to moderate
Soil depth	20–84 in
Surface fragment cover <=3"	2–25%
Surface fragment cover >3"	1–2%
Available water capacity (0-40in)	4.7–5.2 in
Calcium carbonate equivalent (0-40in)	0–40%
Electrical conductivity (0-40in)	0–8 mmhos/cm
Sodium adsorption ratio (0-40in)	0–13
Soil reaction (1:1 water) (0-40in)	7.9–9
Subsurface fragment volume <=3" (Depth not specified)	2–25%
Subsurface fragment volume >3" (Depth not specified)	1–2%

Ecological dynamics

Please refer to group concept R030XB230CA to view the provisional STM.

As ecological condition deteriorates, bush muhly, cool season grasses and palatable shrubs decline as big galleta, dropseed, and shrubs; such as Anderson wolfberry, white burrobrush, and creosotebush increase. Big galleta and the dropseeds are increasers on this site, but these too can disappear with continued condition deterioration. Introduced annual grasses and forbs readily invade this site.

Fire Ecology:
Fires in the Mojave Desert are infrequent and of low severity because production of annual and perennial herbs seldom provides a fuel load capable of sustaining fire. Fire top-kills or kills fourwing saltbush, depending upon ecotype. Fourwing saltbush may sprout after top-kill. Spiny hopsage is considered to be somewhat fire tolerant and often survives fires that kill sagebrush. Mature spiny hopsage generally sprout after being burned. Spiny hopsage is reported to be least susceptible to fire during summer dormancy. Winterfat is an important forage plant for livestock in salt-desert shrub rangeland and subalkaline flats. 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. 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. 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. 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. Sand dropseed is usually killed or top killed by fire. Individual plants are badly damaged to completely killed by fire, with younger plants suffering less than older plants. Sand dropseed has the potential for postfire regeneration and seedling establishment as seeds within burned areas may remain viable. Mesa dropseed is damaged by fire, but its susceptibility relative to other grasses, and its period of recovery, are poorly understood. 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

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 big galleta, Indian ricegrass, and fourwing saltbush. Other important species occurring on this site are spiny hopsage and winterfat. Potential vegetative composition is about 35% grasses, 10% annual and perennial forbs, and 55% shrubs. Approximate ground cover (basal and crown) is 25 to 35 percent.

Table 5. Annual production by plant type

Plant Type	Low (Lb/Acre)	Representative Value (Lb/Acre)	High (Lb/Acre)
Shrub/Vine	248	385	550
Grass/Grasslike	157	245	350
Forb	45	70	100
Total	**450**	**700**	**1000**

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**			85–280	
	big galleta	PLRI3	*Pleuraphis rigida*	35–105	–
	Indian ricegrass	ACHY	*Achnatherum hymenoides*	35–105	–
	bush muhly	MUPO2	*Muhlenbergia porteri*	1–35	–
	spike dropseed	SPCO4	*Sporobolus contractus*	5–12	–
	sand dropseed	SPCR	*Sporobolus cryptandrus*	5–12	–
	mesa dropseed	SPFL2	*Sporobolus flexuosus*	5–12	–
2	**Secondary Perennial Grasses**			14–56	
	desert needlegrass	ACSP12	*Achnatherum speciosum*	4–21	–
	low woollygrass	DAPU7	*Dasyochloa pulchella*	4–21	–
	squirreltail	ELEL5	*Elymus elymoides*	4–21	–
	desert needlegrass	ACSP12	*Achnatherum speciosum*	4–21	–
	low woollygrass	DAPU7	*Dasyochloa pulchella*	4–21	–
	squirreltail	ELEL5	*Elymus elymoides*	4–21	–
3	**Annual Grasses**			1–21	
Forb					
4	**Perennial forbs**			14–70	
	woolly desert marigold	BAPL3	*Baileya pleniradiata*	4–14	–
	desert globemallow	SPAM2	*Sphaeralcea ambigua*	4–14	–
5	**Annual forbs**			1–70	
Shrub/Vine					
6	**Primary shrubs**			203–420	
	fourwing saltbush	ATCA2	*Atriplex canescens*	105–210	–
	spiny hopsage	GRSP	*Grayia spinosa*	35–70	–
	winterfat	KRLA2	*Krascheninnikovia lanata*	35–70	–
	desert-thorn	LYCIU	*Lycium*	14–35	–
	Nevada jointfir	EPNE	*Ephedra nevadensis*	14–35	–
7	**Secondary shrubs**			35–105	
	burrobrush	HYSA	*Hymenoclea salsola*	7–21	–
	creosote bush	LATR2	*Larrea tridentata*	7–21	–

Animal community

Livestock Interpretations:
This site is suitable for livestock grazing. Big galleta is considered a valuable forage plant for cattle and domestic sheep. Its coarse, rigid culms make it relatively resistant to heavy grazing and trampling. 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. Sand dropseed provides fair to good forage for livestock. Sand dropseed's value as livestock forage is regional and dependent upon season. If fall rains are adequate, sand dropseed may have a period of renewed growth, producing new shoots in old sheaths. The persistent green base throughout winter makes sand dropseed an important desert winter range plant. In general, sand dropseed provides fair winter forage for domestic sheep and is most preferred by cattle of dune rangelands. Cattle eat mesa dropseed all year long. Use is heaviest during the summer when the plant is actively growing. Mesa dropseed becomes unpalatable and low in nutrition at maturity. Bush muhly is readily eaten by livestock throughout the year when available; however, it is usually not abundant enough to provide much forage. It is grazed heavily in

winter when other species become scarce. Because of its branching habit, it is extremely susceptible to heavy grazing. Bush muhly is damaged when continuously grazed to a stubble height of less than 4 inches (10 cm). Fourwing saltbush is one of the most palatable shrubs in the West. It provides nutritious forage for all classes of livestock. Fourwing saltbush is adapted to browsing, and may show compensatory growth after stem removal. Old crown wood can produce vigorous sprouts after new growth is browsed; however, plants decline when subjected to overuse. Spiny hopsage as being browsed by livestock in the fall, winter, and spring. Spiny hopsage is used as forage to at least some extent by domestic sheep and goats. The large quantities of seeds produced are valuable for fattening domestic sheep. Spiny hopsage readily establishes and increases on overgrazed and denuded ranges. Winterfat is an important forage plant for livestock in salt-desert shrub rangeland. 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. Nevada ephedra is important winter range browse for domestic cattle, sheep and goats.

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:
Fourwing saltbush provides valuable habitat and year-round browse for wildlife. Spiny hopsage provides a palatable and nutritious food source for big game, particularly during late winter through spring. Winterfat is an important forage plant for wildlife in salt-desert shrub rangeland. Animals that browse winterfat include mule 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. 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. Sand dropseed provides poor forage for wildlife. Large mammals in general show little use of sand dropseed. Sand dropseed is not preferred by pronghorn, elk, and deer. Small mammals and birds utilize sand dropseed to a greater extent than large mammals. Pronghorns consume mesa dropseed. Mesa dropseed becomes unpalatable and low in nutrition at maturity. The palatability of bush muhly for wildlife species is rated fair to poor.

Hydrological functions

Runoff is very low to high. Permeability is moderately slow to moderate.

Other products

Indian ricegrass was traditionally eaten by some Native Americans. The Paiutes used seed as a reserve food source. Sand dropseed is an edible grass used by Native Americans. Native Americans used mesa dropseed seeds as food. Some Native American peoples traditionally ground parched seeds of spiny hopsage to make pinole flour. Some Native American tribes steeped the twigs of Nevada ephedra and drank the tea as a general beverage.

Other information

Big galleta's clumped growth form stabilizes blowing sand. Sand dropseed is recommended as a component of grass seed mixtures for sandy and heavy to semi-sandy soils. Good results are seen reseeding dry low lands receiving less than 9 inches (230mm) of precipitation within rangelands of Nevada. Spiny hopsage has moderate potential for erosion control and low to high potential for long-term revegetation projects. It can improve forage, control wind erosion, and increase soil stability on gentle to moderate slopes. Spiny hopsage is suitable for highway plantings on dry sites in Nevada.

Type locality

Location 1: Lincoln County, NV

Township/Range/Section	T10S R68E S1
General legal description	Tule Desert Well area, Tule Desert, Lincoln County, Nevada. This site also occurs in Clark County, Nevada.
Location 2: Lincoln County, NV	
Township/Range/Section	T10S R68E S12
General legal description	Tule Desert Well area, Tule Desert, Lincoln 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

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Approval

Kendra Moseley, 3/11/2025

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	05/10/2025
Approved by	Kendra Moseley
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:**

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17. **Perennial plant reproductive capability:**
