USDA Natural Resources
Conservation Service

Ecological site R030XB063NV
SANDHILL 5-7 P.Z.

Last updated: 2/24/2025
Accessed: 05/12/2025

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 thick sand sheets covering fan piedmonts and alluvial plains. Slopes range from 2 to 30 percent, but slope gradients of 4 to 15 percent are typical. Elevations are 1500 to about 3000 feet. The soil associated with this site are coarse textured aeolian deposits derived from mixed rock sources.

Please refer to group concept R030XB137CA to view the provisional STM.

Associated sites

R030XB004NV	**SANDY 5-7 P.Z.**

Similar sites

R030XB034NV	**SANDY PLAIN 5-7 P.Z.** More productive site; slopes less than 8%
R030XB054NV	**SANDY 3-5 P.Z.** Less productive site; slopes less than 8%
R030XB121NV	**SANDY PLAIN 3-5 P.Z.** Slopes typically 2 to 4%
R030XB096NV	**GRAVELLY SAND 3-5 P.Z.** AMDU2-TIPA codominant shrubs; less productive site
R030XB004NV	**SANDY 5-7 P.Z.** Less productive site; slopes less than 8%

Table 1. Dominant plant species

Tree	Not specified
Shrub	(1) *Ambrosia dumosa*
Herbaceous	(1) *Pleuraphis rigida* (2) *Achnatherum hymenoides*

Physiographic features

This site occurs on thick sand sheets covering fan piedmonts and alluvial plains. Slopes range from 2 to 30 percent, but slope gradients of 4 to 15 percent are typical. Elevations are 1500 to about 3000 feet.

Table 2. Representative physiographic features

Landforms	(1) Sand sheet (2) Fan piedmont
Elevation	1,500–3,000 ft
Slope	2–30%

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 65 degrees F. The average growing season is about 190 to 240 days.

Table 3. Representative climatic features

Frost-free period (average)	240 days
Freeze-free period (average)	
Precipitation total (average)	7 in

Influencing water features

Because of rapid intake and deep percolation of water, the loss of soil moisture due to evaporation is reduced and runoff is negligible.

Soil features

The soil associated with this site are coarse textured aeolian deposits derived from mixed rock sources. These soils are deep to very deep and excessively drained. The coarse textured, single-grained, surface soils are at least 20 inches in depth. Surface cover of pebble-sized rock fragments is typically less than 5 percent. Because of rapid intake and deep percolation of water, the loss of soil moisture due to evaporation is reduced and runoff is negligible. The soils are extremely susceptible to wind erosion. Small "blow-out" spots are common and, collectively, may represent as much as 2 percent of the total surface area for the site. Potential for sheet and rill erosion is slight, but wind erosion potential is high.

Ecological dynamics

Please refer to group concept R030XB137CA to view the provisional STM.

As ecological condition deteriorates, perennial grasses decrease as creosotebush and white bursage become dominant. Introduced annual forbs and grasses 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 generally kills white bursage. However, most white bursage plants burned because their canopies contained numerous small branches in proximity to herbaceous fuels. 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. Fourwing saltbush is most common under regimes of infrequent fire and moderate browsing. Fire top-kills or kills fourwing saltbush, depending upon ecotype. Fourwing saltbush may sprout after top-kill. 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. Desert grasslands with mesa dropseed were probably characterized by frequent fire. Mesa dropseed is damaged by fire, but its susceptibility relative to other grasses, and its period of recovery, are poorly understood. Research is badly needed on fire's effects on mesa dropseed.

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 white bursage and Indian ricegrass. Potential vegetative composition is about 60% grasses, 15% annual and perennial forbs, and 25% shrubs. Approximate ground cover (basal and crown) is 5 to 15 percent.

Table 4. Annual production by plant type

Plant Type	Low (Lb/Acre)	Representative Value (Lb/Acre)	High (Lb/Acre)
Grass/Grasslike	420	600	900
Shrub/Vine	175	250	375
Forb	105	150	225
Total	**700**	**1000**	**1500**

Additional community tables

Table 5. Community 1.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production (Lb/Acre)	Foliar Cover (%)
Grass/Grasslike					
1	**Primary Perennial forbs**			520–880	
	big galleta	PLRI3	*Pleuraphis rigida*	350–500	–
	Indian ricegrass	ACHY	*Achnatherum hymenoides*	150–300	–
	spike dropseed	SPCO4	*Sporobolus contractus*	7–27	–
	sand dropseed	SPCR	*Sporobolus cryptandrus*	7–27	–
	mesa dropseed	SPFL2	*Sporobolus flexuosus*	7–27	–
2	**Secondary Perennial Grasses**			20–80	
	threeawn	ARIST	*Aristida*	5–20	–
	low woollygrass	DAPU7	*Dasyochloa pulchella*	5–20	–
	bush muhly	MUPO2	*Muhlenbergia porteri*	5–20	–
3	**Annual Grasses**			1–20	
Forb					
4	**Perennial forbs**			20–100	
	desert globemallow	SPAM2	*Sphaeralcea ambigua*	5–30	–
5	**Annual forbs**			1–100	
Shrub/Vine					
6	**Primary shrubs**			110–250	
	burrobush	AMDU2	*Ambrosia dumosa*	50–100	–
	fourwing saltbush	ATCA2	*Atriplex canescens*	20–50	–
	jointfir	EPHED	*Ephedra*	20–50	–
	winterfat	KRLA2	*Krascheninnikovia lanata*	20–50	–
7	**Secondary shrubs**			20–50	
	catclaw acacia	ACGR	*Acacia greggii*	10–30	–
	Virgin River brittlebush	ENVI	*Encelia virginensis*	10–30	–
	white ratany	KRGR	*Krameria grayi*	10–30	–
	creosote bush	LATR2	*Larrea tridentata*	10–30	–
	desert-thorn	LYCIU	*Lycium*	10–30	–
	whitestem paperflower	PSCO2	*Psilostrophe cooperi*	10–30	–
	Joshua tree	YUBR	*Yucca brevifolia*	10–30	–
	Mojave yucca	YUSC2	*Yucca schidigera*	10–30	–

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. White bursage is of intermediate forage value. It is fair to good forage for horses and fair to poor for cattle and sheep. However, because there is often little other

forage where white bursage grows, it is often highly valuable to browsing animals and is sensitive to browsing. 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. Fourwing saltbush is 1 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.

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:
White bursage is an important browse species for wildlife. Winterfat is an important forage plant for wildlife in salt-desert shrub rangeland and subalkaline flats. Animals that browse winterfat include mule deer, Rocky Mountain elk, desert bighorn sheep, and pronghorn antelope. Fourwing saltbush provides valuable habitat and year-round browse for wildlife. 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.

Hydrological functions

Because of rapid intake and deep percolation of water, the loss of soil moisture due to evaporation is reduced and runoff is negligible.

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. White bursage is a host for sandfood, a parasitic plant. Sandfood was a valuable food supply for Native Americans.

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. Mesa dropseed is important in depleted stands of black grama. It stabilizes the loose, sandy soils giving the slower-growing black grama time to revegetate. White bursage may be used to revegetate disturbed sites in southwestern deserts.

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

RWA

Approval

Sarah Quistberg, 2/24/2025

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)	P Novak-Echenique
Contact for lead author	State Rangeland Management Specialist
Date	04/27/2011
Approved by	Sarah Quistberg
Approval date	
Composition (Indicators 10 and 12) based on	Annual Production

Indicators

1. **Number and extent of rills:** None

2. **Presence of water flow patterns:** None

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 to 80%; surface rock fragments absent; shrub canopy to 4%; perennial herbaceous plants to 12%.

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

6. **Extent of wind scoured, blowouts and/or depositional areas:** A few wind-scoured spots may occur, but will be isolated and small in aerial extent.

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 storms. Persistent litter (large woody material) will remain in place except during large rainfall or wind storm 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 the sandy 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 single grain. Soil surface colors are pale browns and soils are typified by an ochric epipedon. Organic matter of the surface 2 to 3 inches is typically less than 1 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 slow runoff and increase infiltration. Sparse canopy and litter provide some protection from raindrop impact.

---

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: warm-season, perennial bunchgrasses

    Sub-dominant: Cool-season, perennial bunchgrasses > Mojave Desert shrubs > perennial forbs = annual forbs > annual grasses

    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 (±25%) have dead centers.

---

14. **Average percent litter cover (%) and depth (in):** Between plant interspaces (10-20%) and depth of litter is <1/4 inch.

---

15. **Expected annual annual-production (this is TOTAL above-ground annual-production, not just forage annual-production):** For normal or average growing season ± 1000lbs/ac. Favorable years ±1500 lbs/ac and unfavorable years ±700 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 on this site include red brome, red-stem filaree, annual mustards, and

Mediterranean grass.

---

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 extreme drought or extended drought periods.
