Ecological site R030XA069NV
LIMY SAND 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 sand sheets. Slopes range from 0 to 30 percent, but slope gradients of 2 to 15 percent are most typical. Elevations are 2600 to 4100 feet. The soils associated with this site are very deep eolian sands derived from mixed parent materials.

Please refer to group concept R030XB148CA to view the provisional STM.

Associated sites

R030XA011NV	**SILTY TERRACE 5-7 P.Z.**
R030XY013NV	**SHALLOW SILTY**
R030XY045NV	**DUNES 3-7 P.Z.**

Similar sites

R030XA011NV	**SILTY TERRACE 5-7 P.Z.** ATTO-ATCA2 codominant; ATCO major shrub
R030XA063NV	**SANDY 5-7 P.Z.** More productive site
R030XA058NV	**LIMY 5-7 P.Z.** ATCA2 & KRLA2 minor shrubs, if present

Table 1. Dominant plant species

Tree	Not specified
Shrub	(1) *Larrea tridentata* (2) *Atriplex canescens*
Herbaceous	(1) *Achnatherum hymenoides*

Physiographic features

This site occurs on sand sheets. Slopes range from 0 to 30 percent, but slope gradients of 2 to 15 percent are most typical. Elevations are 2600 to 4100 feet.

Table 2. Representative physiographic features

Landforms	(1) Sand sheet
Flooding duration	Extremely brief (0.1 to 4 hours) to very brief (4 to 48 hours)

Flooding frequency	Very rare to rare
Ponding frequency	None
Elevation	792–1,250 m
Slope	0–30%
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 65 degrees F. The average growing season is about 150 to 230 days.

Table 3. Representative climatic features

Frost-free period (average)	230 days
Freeze-free period (average)	
Precipitation total (average)	178 mm

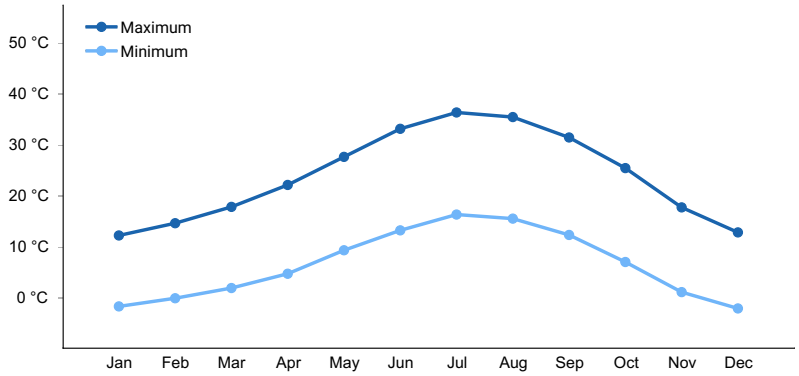

Figure 1. Monthly average minimum and maximum temperature

Influencing water features

There are no influencing water features associated with this site.

Soil features

The soils associated with this site are very deep eolian sands derived from mixed parent materials. Water intake rates are moderately rapid, available water capacity is very low and runoff is negligible to very low. These soils are somewhat excessively drained. The soil series associated with this site include: Bluepoint and Hypoint.

Table 4. Representative soil features

Surface texture	(1) Loamy fine sand (2) Very fine sandy loam (3) Loamy sand
Family particle size	(1) Sandy
Drainage class	Somewhat excessively drained
Permeability class	Moderately rapid
Soil depth	183–213 cm
Surface fragment cover <=3"	16–21%
Surface fragment cover >3"	0%

Available water capacity (0-101.6cm)	5.33–7.11 cm
Calcium carbonate equivalent (0-101.6cm)	0–15%
Electrical conductivity (0-101.6cm)	0–4 mmhos/cm
Sodium adsorption ratio (0-101.6cm)	0–12
Soil reaction (1:1 water) (0-101.6cm)	7.4–9
Subsurface fragment volume <=3" (Depth not specified)	16–21%
Subsurface fragment volume >3" (Depth not specified)	0%

Ecological dynamics

Please refer to group concept R030XB148CA to view the provisional STM.

As ecological condition declines, creosotebush, burrobrush and white bursage increase as fourwing saltbush, winterfat, and perennial grasses decrease. Introduced annual forbs (filaree) and grasses (red brome) 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. Fires in creosotebush scrub were an infrequent event in pre-settlement desert habitats, because fine fuels from winter annual plants were probably sparse, only occurring in large amounts during exceptionally wet winters. Fire kills many creosotebush. Creosotebush is poorly adapted to fire because of its limited sprouting ability. Creosotebush survives some fires that burn patchily or are of low severity. 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. 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. 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.

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 fourwing saltbush, winterfat and creosotebush. Indian ricegrass and sand dropseed are other important species associated with this site. Potential vegetative composition is about 35% perennial and annual grasses, 10% perennial and annual forbs and 55% shrubs. Approximate ground cover (basal and crown) is 4 to 10 percent.

Table 5. Annual production by plant type

Plant Type	Low (Kg/Hectare)	Representative Value (Kg/Hectare)	High (Kg/Hectare)
Shrub/Vine	62	155	247
Grass/Grasslike	39	98	157
Forb	11	28	45
Total	**112**	**281**	**449**

Additional community tables

Table 6. Community 1.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production (Kg/Hectare)	Foliar Cover (%)
Grass/Grasslike					
1	**Primary Perennial Grasses**			56–112	
	Indian ricegrass	ACHY	*Achnatherum hymenoides*	28–56	–
	sand dropseed	SPCR	*Sporobolus cryptandrus*	28–56	–
2	**Secondary Perennial Grasses**			15–28	
	desert needlegrass	ACSP12	*Achnatherum speciosum*	1–9	–
	low woollygrass	DAPU7	*Dasyochloa pulchella*	1–9	–
	James' galleta	PLJA	*Pleuraphis jamesii*	1–9	–
3	**Annual Grasses**			1–15	
Forb					
4	**Perennial Forbs**			6–28	
	milkvetch	ASTRA	*Astragalus*	1–6	–
	desert globemallow	SPAM2	*Sphaeralcea ambigua*	1–6	–
5	**Annual forbs**			1–28	
Shrub/Vine					
6	**Primary shrubs**			99–184	
	creosote bush	LATR2	*Larrea tridentata*	28–56	–
	burrobush	AMDU2	*Ambrosia dumosa*	15–43	–
	fourwing saltbush	ATCA2	*Atriplex canescens*	28–43	–
	winterfat	KRLA2	*Krascheninnikovia lanata*	28–43	–
7	**Secondary shrubs**			15–43	
	Nevada jointfir	EPNE	*Ephedra nevadensis*	3–9	–
	spiny hopsage	GRSP	*Grayia spinosa*	3–9	–
	burrobrush	HYSA	*Hymenoclea salsola*	3–9	–
	water jacket	LYAN	*Lycium andersonii*	3–9	–
	Nevada dalea	PSPO	*Psorothamnus polydenius*	3–9	–
	horsebrush	TETRA3	*Tetradymia*	3–9	–

Animal community

Livestock Interpretations:
This site has limited value for livestock grazing, due to the low forage production, steep slopes and stony surfaces. 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. Creosotebush is unpalatable to livestock. Consumption of creosotebush may be fatal to sheep. 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. 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. 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.

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:
Creosotebush is unpalatable to most browsing wildlife. Fourwing saltbush provides valuable habitat and year-round browse 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. White bursage is an important browse species 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.

Hydrological functions

Runoff is negligible to very low. Permeability is moderately rapid.

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. Creosotebush has been highly valued for its medicinal properties by Native Americans. It has been used to treat at least 14 illnesses. Twigs and leaves may be boiled as tea, steamed, pounded into a powder, pressed into a poultice, or heated into an infusion. White bursage is a host for sandfood, a parasitic plant. Sandfood was a valuable food supply for Native Americans.

Other information

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. Once established, creosotebush may improve sites for annuals that grow under its canopy by trapping fine soil, organic matter, and symbiont propagules. It may also increase water infiltration and storage. White bursage may be used to revegetate disturbed sites in southwestern deserts.

Type locality

Location 1: Nye County, NV	
Township/Range/Section	T9S R43E S10
General legal description	Bonnie Claire Lake area, along the Nye and Esmeralda County line, Nye County, Nevada. This site also occurs in southern Esmeralda County and southwest Nye County, Nevada.
Location 2: Nye County, NV	
Township/Range/Section	T9S R43E S15
General legal description	Bonnie Claire Lake area, along the Nye and Esmeralda County line, Nye County, Nevada. This site also occurs in southern Esmeralda County and southwest Nye 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	05/13/2025
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):**

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9. **Soil surface structure and SOM content (include type of structure and A-horizon color and thickness):**

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10. **Effect of community phase composition (relative proportion of different functional groups) and spatial distribution on infiltration and runoff:**

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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):**

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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:

    Sub-dominant:

    Other:

    Additional:

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13. **Amount of plant mortality and decadence (include which functional groups are expected to show mortality or decadence):**

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14. **Average percent litter cover (%) and depth (in):**

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15. **Expected annual annual-production (this is TOTAL above-ground annual-production, not just forage annual-production):**

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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:**

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17. **Perennial plant reproductive capability:**
