USDA Natural Resources
Conservation Service

Ecological site R030XA051NV
COBBLY CLAYPAN 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 fan skirts and alluvial flats. Slopes range from 0 to 8 percent. Elevations are 2500 to 4600 feet. The soils associated with this site are very deep, and have formed in alluvium from mixed rock sources.

Please refer to group concept R030XB006NV to view the provisional STM.

Similar sites

R030XA071NV	**COBBLY LOAM 5-7 P.Z.** ATCO rare to absent
R030XA061NV	**LOAMY 5-7 P.Z.** Greater shrub diversity
R030XA066NV	**CALCAREOUS LOAM 5-7 P.Z.** AMDU2-ATCO codominant shrubs
R030XA050NV	**LOAMY 3-5 P.Z.** MESP2, AMDU2 & ARSP5 minor shrubs, if present
R030XA053NV	**CALCAREOUS LOAM 3-5 P.Z.** LATR2 codominant shrub
R030XA068NV	**CALCAREOUS HILL 5-7 P.Z.** On hill landscapes; soils not alluvial
R030XA056NV	**LOAMY HILL 3-5 P.Z.** On hill landscapes; soils not alluvial
R030XA044NV	**LOAMY HILL 5-7 P.Z.** On hill landscapes; soils not alluvial; LYAN & EPHED major shrubs

Table 1. Dominant plant species

Tree	Not specified
Shrub	(1) *Atriplex confertifolia* (2) *Menodora spinescens*
Herbaceous	(1) *Achnatherum hymenoides*

Physiographic features

This site occurs on fan skirts and alluvial flats. Slopes range from 0 to 8 percent. Elevations are 2500 to 4600 feet.

Table 2. Representative physiographic features

Landforms	(1) Alluvial flat (2) Fan skirt
Flooding duration	Very brief (4 to 48 hours)
Flooding frequency	Rare
Ponding frequency	None
Elevation	762–1,402 m
Slope	0–8%
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 about 7 inches. Mean annual air temperature is 54 to 67 degrees F. The average growing season is about 150 to 210 days.

Table 3. Representative climatic features

Frost-free period (average)	210 days
Freeze-free period (average)	
Precipitation total (average)	178 mm

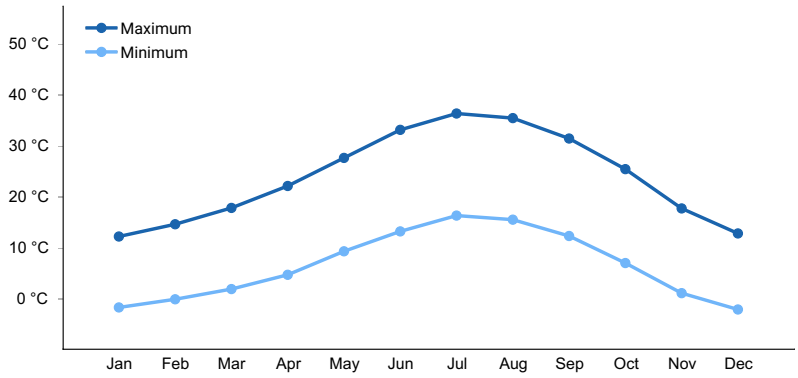

Figure 1. Monthly average minimum and maximum temperature

Influencing water features

There are no influencing water features associated with this site.

Soil features

The soils associated with this site are very deep, and have formed in alluvium from mixed rock sources. High amounts of rock fragments occur at the soil surface which occupy plant growing space yet help to reduce evaporation and conserve soil moisture. Runoff is very low to low, available water capacity is very low to low and water intake rates are moderately rapid. The soil series associated with this site include: Arizo, Corbilt, and Orwash.

Table 4. Representative soil features

Surface texture	(1) Very gravelly sandy loam (2) Gravelly fine sandy loam (3) Gravelly coarse sandy loam
Family particle size	(1) Loamy
Drainage class	Well drained to excessively drained

Permeability class	Moderately rapid
Soil depth	183–213 cm
Surface fragment cover <=3"	50–55%
Surface fragment cover >3"	0–2%
Available water capacity (0-101.6cm)	4.32–11.18 cm
Calcium carbonate equivalent (0-101.6cm)	1–20%
Electrical conductivity (0-101.6cm)	0–2 mmhos/cm
Sodium adsorption ratio (0-101.6cm)	0–12
Soil reaction (1:1 water) (0-101.6cm)	7.4–9.6
Subsurface fragment volume <=3" (Depth not specified)	18–34%
Subsurface fragment volume >3" (Depth not specified)	2–10%

Ecological dynamics

Please refer to group concept R030XB006NV to view the provisional STM.

Following surface disturbance, white burrobrush increases. Following wildfire, horsebrush, rabbitbrush and snakeweed increase and introduced annual grasses and forbs readily invade or increase on the site.

Fire Ecology:
The mean fire return interval for shadscale communities range from 35 to 100 years. 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. 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. Spiny menodora often survives fire because its foliage does not readily burn. Shadscale is fire intolerant and it does not readily recover from fire, except for establishment through seed. Fire generally kills white bursage. However, most white bursage plants burned because their canopies contained numerous small branches in proximity to herbaceous fuels. Budsage is killed by fire. 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. 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.

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 shadscale. Spiny menodora, white bursage, bud sagebrush and Indian ricegrass are other important plants associated with this site. Potential vegetative composition is about 20% grasses, 5% forbs and 75% shrubs. Approximate ground cover (basal and crown) is 5 to 12 percent.

Table 5. Annual production by plant type

Plant Type	Low (Kg/Hectare)	Representative Value (Kg/Hectare)	High (Kg/Hectare)
Shrub/Vine	84	168	252
Grass/Grasslike	22	45	67
Forb	6	11	17
Total	**112**	**224**	**336**

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**			16–52	
	Indian ricegrass	ACHY	*Achnatherum hymenoides*	11–34	–
	desert needlegrass	ACSP12	*Achnatherum speciosum*	4–18	–
2	**Secondary Perennial Grasses**			4–11	
	King's eyelashgrass	BLKI	*Blepharidachne kingii*	1–7	–
Forb					
3	**Perennial forbs**			4–18	
4	**Annual forbs**			1–11	
Shrub/Vine					
5	**Primary shrubs**			117–220	
	shadscale saltbush	ATCO	*Atriplex confertifolia*	78–112	–
	burrobush	AMDU2	*Ambrosia dumosa*	11–34	–
	spiny menodora	MESP2	*Menodora spinescens*	11–34	–
	Nevada jointfir	EPNE	*Ephedra nevadensis*	4–18	–
6	**Secondary shrubs**			11–34	
	fourwing saltbush	ATCA2	*Atriplex canescens*	2–7	–
	rabbitbrush	CHRYS9	*Chrysothamnus*	2–7	–
	spiny hopsage	GRSP	*Grayia spinosa*	2–7	–
	burrobrush	HYSA	*Hymenoclea salsola*	2–7	–
	winterfat	KRLA2	*Krascheninnikovia lanata*	2–7	–
	creosote bush	LATR2	*Larrea tridentata*	2–7	–
	desert-thorn	LYCIU	*Lycium*	2–7	–
	horsebrush	TETRA3	*Tetradymia*	2–7	–

Animal community

Livestock Interpretations:
Abusive grazing management of livestock or feral horses/burros results in loss of perennial grasses. With continued abusive grazing, white bursage may also decline.
This site has limited value for livestock grazing, due to the low forage production. Desert needlegrass produces considerable basal foliage and is good forage while young. Young desert needlegrass is palatable to all classes of livestock. Mature herbage is moderately grazed by horses and cattle but rarely grazed by sheep. 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. 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. Cattle will graze the stems of spiny menodora in the spring before the stems become woody and spiny. Spiny menodora has lower palatability than the other shrubs but is consumed during early spring before spines mature. 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. Budsage can be poisonous or fatal to calves when eaten in quantity. Cattle and horses seldom utilize budsage, possibly because of its aromatic oil content. Nevada ephedra is important winter range browse for domestic cattle, sheep and goats. Nevada ephedra is usually grazed heavily and seems to be perfectly safe for grazing livestock since it induces neither toxicity in ewes or cows, nor congenital deformities in lambs.

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. Elk will graze the stems of spiny menodora in the spring before the stems become woody and spiny. White bursage is an important browse species for wildlife. Budsage is rated as utilized by mule deer in Nevada in winter and is utilized by bighorn sheep in summer. Black-tailed jackrabbits and small rodents generally eat only leaves, small branches, and twigs of budsage. 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. 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.

Hydrological functions

Runoff is very low to 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. Seeds of shadscale were used by Native Americans for bread and mush. White bursage is a host for sandfood, a parasitic plant. Sandfood was a valuable food supply for Native Americans. Some Native American tribes steeped the twigs of Nevada ephedra and drank the tea as a general beverage.

Other information

Desert needlegrass may be used for groundcover in areas of light disturbance, but it is susceptible to excessive trampling. White bursage may be used to revegetate disturbed sites in southwestern deserts.

Type locality

Location 1: Nye County, NV	
Township/Range/Section	T9S R46E S8
General legal description	Erosional fan remnants about 5 miles southeast of Bonnie Claire, Nye County, Nevada. This site also occurs in Southern Nye County, Nevada.
Location 2: Nye County, NV	
Township/Range/Section	T10S R46E S20
General legal description	Sarcobatus Valley, Nye County, Nevada. This site also occurs in Southern 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, 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)	
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):**

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:**

17. **Perennial plant reproductive capability:**