USDA Natural Resources
Conservation Service

Ecological site R030XY040NV
SODIC TERRACE

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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 alluvial flats, lake plains or axial stream terraces. Slope gradients of 0 to 4 percent are typical. Elevations are 1200 to about 3500 feet. Surface soil textures are sandy loam to clay.

Please refer to group concept R030XB045CA to view provisional STM.

Similar sites

R030XY047NV	**ALLUVIAL PLAIN** ATPO dominant plant.
R030XA062NV	**SILT FLAT 3-5 P.Z.** SPAI & DISP rare to absent; ATPO rare to absent.

Table 1. Dominant plant species

Tree	Not specified
Shrub	(1) *Atriplex confertifolia* (2) *Lycium*
Herbaceous	(1) *Sporobolus airoides*

Physiographic features

This site occurs on alluvial flats, lake plains or axial stream terraces. Slope gradients of 0 to 4 percent are typical. Elevations are 1200 to about 3500 feet.

Table 2. Representative physiographic features

Landforms	(1) Alluvial flat (2) Lake plain (3) Stream terrace
Flooding duration	Very brief (4 to 48 hours)
Flooding frequency	Rare
Ponding duration	Very brief (4 to 48 hours)
Ponding frequency	Rare
Elevation	1,200–3,500 ft
Slope	0–4%
Water table depth	57 in

Climatic features

The climate of the Mojave Desert has extreme fluctuations of daily temperatures, strong seasonal winds, and clear skies. The climate is arid and is characterized with cool, moist winters and hot, dry summers. Most of the rainfall falls between November and April. Summer convection storms from July to September may contribute up to 25 percent of the annual precipitation. Average annual precipitation is 3 to 7 inches. Mean annual air temperature is 55 to 76 degrees F. The average growing season is about 140 to 360 days.

Table 3. Representative climatic features

Frost-free period (average)	360 days
Freeze-free period (average)	
Precipitation total (average)	7 in

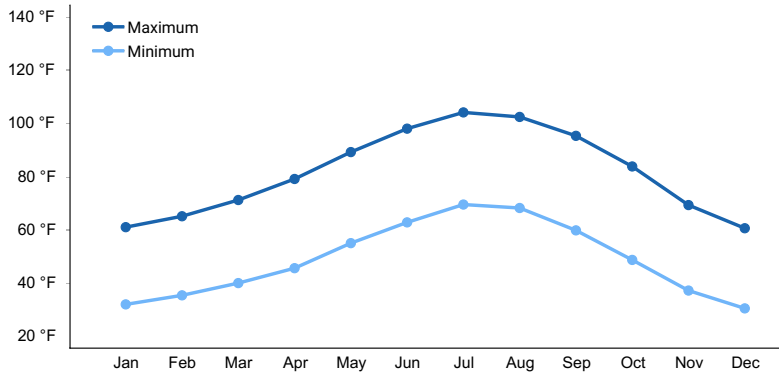

Figure 1. Monthly average minimum and maximum temperature

Influencing water features

There are no influencing water features associated with this site.

Soil features

The soils of this site are deep to very deep and have formed in alluvium from mixed rock sources. Surface soil textures are sandy loam to clay. These soils are somewhat poorly drained to well drained and have very high amounts of salt and sodium throughout the soil profile. Runoff is very low to low, available water capacity is low to high, and the water intake rate is slow to moderately rapid. The soil series associated with this site include Glencarb, Land, Lewdlac, Nopah, and Seaman.

Table 4. Representative soil features

Surface texture	(1) Very gravelly sandy loam (2) Very gravelly very fine sandy loam (3) Gravelly loamy fine sand
Family particle size	(1) Loamy
Drainage class	Somewhat poorly drained to well drained
Permeability class	Slow to moderately rapid
Soil depth	72–84 in
Surface fragment cover <=3"	0–35%
Surface fragment cover >3"	0–7%
Available water capacity (0-40in)	2.8–7.7 in

Calcium carbonate equivalent (0-40in)	1–65%
Electrical conductivity (0-40in)	0–32 mmhos/cm
Sodium adsorption ratio (0-40in)	0–90
Soil reaction (1:1 water) (0-40in)	7.9–9.6
Subsurface fragment volume <=3" (Depth not specified)	0–44%
Subsurface fragment volume >3" (Depth not specified)	0–10%

Ecological dynamics

Please refer to group concept R030XB045CA to view provisional STM.

As ecological condition deteriorates, wolfberry and cattle saltbush increase. Introduced annual grasses and forbs readily invade this site.

Fire Ecology:
The mean fire return interval for shadscale communities ranges 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 in shadscale communities by increasing fire frequency under wet to near-normal summer moisture conditions. When fire does occur, the effect on the ecosystem may be extreme. Shadscale is fire intolerant and it does not readily recover from fire, except for establishment through seed. Fire top-kills or kills fourwing saltbush, depending upon ecotype. Fourwing saltbush may sprout after top-kill. Fourwing saltbush probably establishes primarily from seed after fire, with some populations also regenerating vegetatively. Fire typically destroys aboveground parts of wolfberry, but the degree of damage to the plant depends on fire severity. Fire top-kills or kills cattle saltbush, depending upon ecotype. Cattle saltbush may sprout after top-kill. Alkali sacaton is classified as tolerant of, but not resistant to, fire. Top-killing by fire is probably frequent, and the plants can be killed by severe fire. Saltgrass rhizomes occur deep in the soil where they are insulated from the heat of most fires. Saltgrass survives fire by sending up new growth from rhizomes.

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 and Lycium spp.. Atriplex species, alkali sacaton and inland saltgrass are other important plants associated with this site. Potential vegetative composition is about 10% grasses, 10% forbs and 80% shrubs. Approximate ground cover (basal and crown) is 8 to 20 percent.

Table 5. Annual production by plant type

Plant Type	Low (Lb/Acre)	Representative Value (Lb/Acre)	High (Lb/Acre)
Shrub/Vine	160	480	640
Forb	20	60	80
Grass/Grasslike	20	60	80
Total	**200**	**600**	**800**

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**			24–78	
	alkali sacaton	SPAI	*Sporobolus airoides*	12–48	–
	saltgrass	DISP	*Distichlis spicata*	12–30	–
2	**Secondary Perennial Grasses**			1–30	
	squirreltail	ELEL5	*Elymus elymoides*	3–12	–
	rush	JUNCU	*Juncus*	3–12	–
Forb					
3	**Perennial Forbs**			12–48	
4	**Annual Forbs**			1–30	
Shrub/Vine					
4	**Primary Shrubs**			234–540	
	shadscale saltbush	ATCO	*Atriplex confertifolia*	120–270	–
	desert-thorn	LYCIU	*Lycium*	60–120	–
	cattle saltbush	ATPO	*Atriplex polycarpa*	30–60	–
	fourwing saltbush	ATCA2	*Atriplex canescens*	12–60	–
	desertholly	ATHY	*Atriplex hymenelytra*	12–30	–
6	**Secondary Shrubs**			30–90	
	iodinebush	ALOC2	*Allenrolfea occidentalis*	6–30	–
	jointfir	EPHED	*Ephedra*	6–30	–
	alkali goldenbush	ISAC2	*Isocoma acradenia*	6–30	–
	desert pepperweed	LEFR2	*Lepidium fremontii*	6–30	–
	seepweed	SUAED	*Suaeda*	6–30	–

Animal community

Livestock Interpretations:
This site is suitable for livestock grazing. Grazing management should be keyed to dominant grasses and palatable shrubs production. Shadscale is a valuable browse species, providing a source of palatable, nutritious forage for a

wide variety of livestock. Shadscale provides good browse for domestic sheep. Shadscale leaves and seeds are an important component of domestic sheep and cattle winter diets. Cattle saltbush and fourwing saltbush are palatable shrubs. Their protein, fat, and carbohydrate levels are comparable to alfalfa. They provides nutritious forage for all classes of livestock. Palatability is rated as good for domestic sheep and domestic goats; fair for cattle; fair to good for horses in winter, poor for horses in other seasons. Alkali sacaton is a valuable forage species. Plants are tolerant to moderate grazing and can produce abundant herbage utilized by livestock. Saltgrass's value as forage depends primarily on the relative availability of other grasses of higher nutritional value and palatability. It can be an especially important late summer grass in arid environments after other forage grasses have deceased. Saltgrass is rated as a fair to good forage species only because it stays green after most other grasses dry. Livestock generally avoid saltgrass due to its coarse foliage. Saltgrass is described as an increaser under grazing pressure.
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 particularly during spring and summer before the hardening of spiny twigs. It supplies browse, seed, and cover for birds, small mammals, rabbits, deer, and pronghorn. Fourwing saltbush and cattle saltbush provide valuable habitat and year-round browse for wildlife. These species also provides browse and shelter for small mammals. Additionally, the browse provides a source of water for black-tailed jackrabbits in arid environments. Granivorous birds consume the fruits. Wild ungulates, rodent and lagomorphs readily consume all aboveground portions of these plants. Palatability is rated good for deer, elk, pronghorn and bighorn sheep. The western salt desert shrub and grassland communities where alkali sacaton is common support an abundance of mule deer, pronghorn, carnivores, small mammals, birds, amphibians, and reptiles. Saltgrass provides cover for a variety of bird species, small mammals, and arthropods and is on occasion used as forage for several big game wildlife species.

Hydrological functions

Runoff is very low to low. Permeability is slow to moderately rapid. Hydrologic soil groups are B, C, and D.

Recreational uses

Aesthetic value is derived from the diverse floral and faunal composition and the colorful flowering of wild flowers and shrubs during the spring and early summer. This site offers rewarding opportunities to photographers and for nature study. This site is used for camping and hiking and has potential for upland and big game hunting.

Other products

Seeds of shadscale were used by Native Americans for bread and mush. Fourwing saltbush is traditionally important to Native Americans. They ground the seeds for flour. The leaves, placed on coals, impart a salty flavor to corn and other roasted food. Top-growth produces a yellow dye. Young leaves and shoots were used to dye wool and other materials. The roots and flowers were ground to soothe insect bites.

Other information

Fourwing saltbush is widely used in rangeland and riparian improvement and reclamation projects, including burned area recovery. It is probably the most widely used shrub for restoration of winter ranges and mined land reclamation. Alkali sacaton is one of the most commonly used species for seeding and stabilizing disturbed lands. Due to alkali sacaton’s salt tolerance, is recommended for native grass seeding on subirrigated saline sites. Given its extensive system of rhizomes and roots which form a dense sod, saltgrass is considered a suitable species for controlling wind and water erosion.

Type locality

Location 1: Nye County, NV	
Township/Range/Section	T17S R51E S19-20

UTM zone	N
UTM northing	4035222
UTM easting	566588
Latitude	36° 27′ 35″
Longitude	116° 15′ 24″
General legal description	Amargosa Flat, Amargosa Desert area, 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, 3/10/2025

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	Sarah Quistberg
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:**
