USDA Natural Resources Conservation Service

Ecological site R029XY076NV
SODIC FLAT

Accessed: 05/10/2025

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.

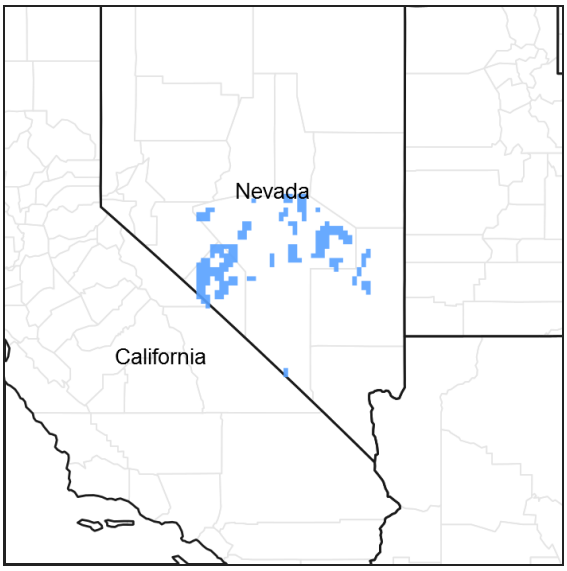

Figure 1. Mapped extent

Areas shown in blue indicate the maximum mapped extent of this ecological site. Other ecological sites likely occur within the highlighted areas. It is also possible for this ecological site to occur outside of highlighted areas if detailed soil survey has not been completed or recently updated.

Associated sites

R029XY002NV	**SALINE MEADOW**
R029XY004NV	**SALINE BOTTOM**
R029XY018NV	**SODIC DUNE**
R029XY024NV	**SODIC TERRACE 5-8 P.Z.**
R029XY063NV	**DRY SODIC TERRACE**

Similar sites

R029XY153NV	**SODIC SANDS** More productive site; soils coarse textured
R029XY093NV	**DEEP SODIC FAN** ATTO dominant shrub; LECI4 dominant grass
R029XY063NV	**DRY SODIC TERRACE** More ATCO; less SAVE4; less productive site
R029XY018NV	**SODIC DUNE** Less productive site; occurs on sandhills

R029XY004NV	**SALINE BOTTOM** SPAI-LECI4 dominant spp; more productive site
R029XY024NV	**SODIC TERRACE 5-8 P.Z.** SAVE4-ATCO codominant; more productive site

Table 1. Dominant plant species

Tree	Not specified
Shrub	(1) *Sarcobatus vermiculatus*
Herbaceous	(1) *Distichlis spicata*

Physiographic features

This site occurs on lake plains and lake plain terraces, usually immediately adjacent to playas. Slopes range from 0 to 30 percent. Slopes gradients of 0 to 2 percent are typical. Elevations are 2300 to about 6600 feet.

Table 2. Representative physiographic features

Landforms	(1) Dune (2) Alluvial flat (3) Basin floor
Flooding duration	Very brief (4 to 48 hours)
Flooding frequency	Rare
Ponding frequency	None
Elevation	2,300–6,600 ft
Slope	0–30%
Aspect	Aspect is not a significant factor

Climatic features

The climate associated with this site is arid, characterized by cool, moist winters and hot, dry summers. Average annual precipitation is 5 to 8 inches. Mean annual air temperature is 50 to 60 degrees F. The average growing season is about 100 to 140 days.

Table 3. Representative climatic features

Frost-free period (average)	140 days
Freeze-free period (average)	0 days
Precipitation total (average)	8 in

Influencing water features

There are no influencing water features associated with this site.

Soil features

The soils in this site are deep to very deep and are well to moderately well drained. Surface soils are medium to moderately fine textured and normally less than 10 inches thick to the subsoil or underlying material. The upper portion of most of these soils is strongly salt and sodium effected due to capillary movement of dissolved salts upward from a ground water table. Effective rooting depths are limited by a water table that fluctuates between 40 to over 60 inches from the soil surface. The soil surface layer will normally crust and bake upon drying, inhibiting water infiltration and seedling emergence. Runoff is low to very high. High salt concentrations reduce the available water holding capacity which is low to very high. Soil series associated with this site include: Blueagle, Cirac, Eleac,

Haymont and Slaw.

Table 4. Representative soil features

Surface texture	(1) Silt loam (2) Fine sandy loam
Drainage class	Well drained to moderately well drained
Permeability class	Slow to moderately rapid
Soil depth	57–72 in
Available water capacity (0-40in)	4.7–7.9 in
Calcium carbonate equivalent (0-40in)	1–35%
Electrical conductivity (0-40in)	0–32 mmhos/cm
Sodium adsorption ratio (0-40in)	1–99
Soil reaction (1:1 water) (0-40in)	7.9–11

Ecological dynamics

As ecological condition declines, the herbaceous understory is reduced or eliminated and the site becomes a community of halophytic shrubs dominated by black greasewood. Halogeton, cheatgrass and annual mustards are species likely to invade this site.

Fire Ecology:
Black greasewood communities have been historically subject to stand-replacing fire regimes with intervals of <100 years.
Black greasewood may be killed by severe fires, but it commonly sprouts soon after low to moderate-severity fire. Shadscale and Parry's saltbush is fire intolerant and it does not readily recover from fire, except for establishment through seed. Fall prescribed burning killed 100% of shadscale and Parry's saltbush on study plots in a basin big sagebrush community. Spring burning left a few surviving shadscale and Parry's saltbush plants but greatly reduced shadscale density and frequency. 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. 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.

State and transition model

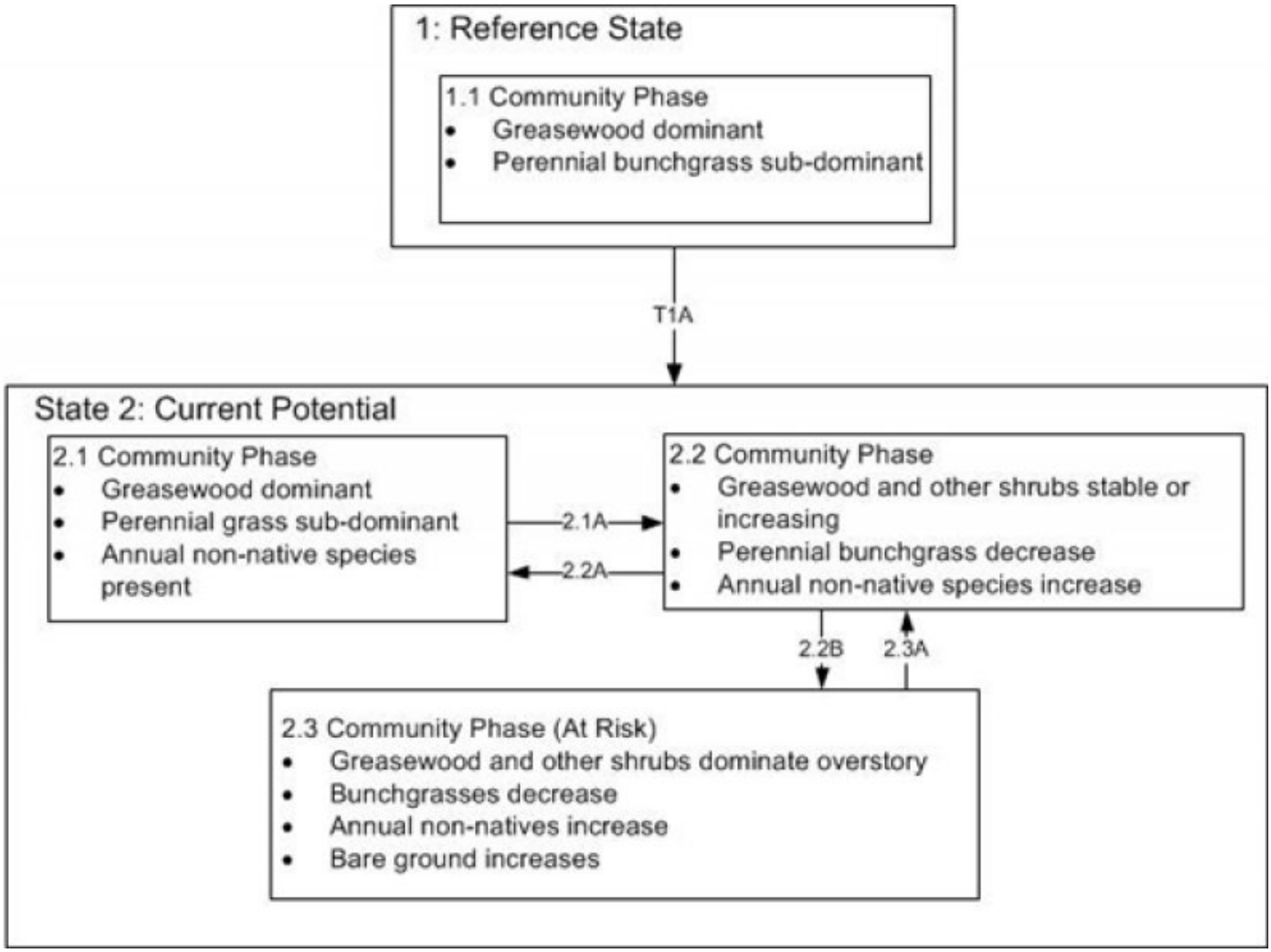

Figure 3. DRAFT STM

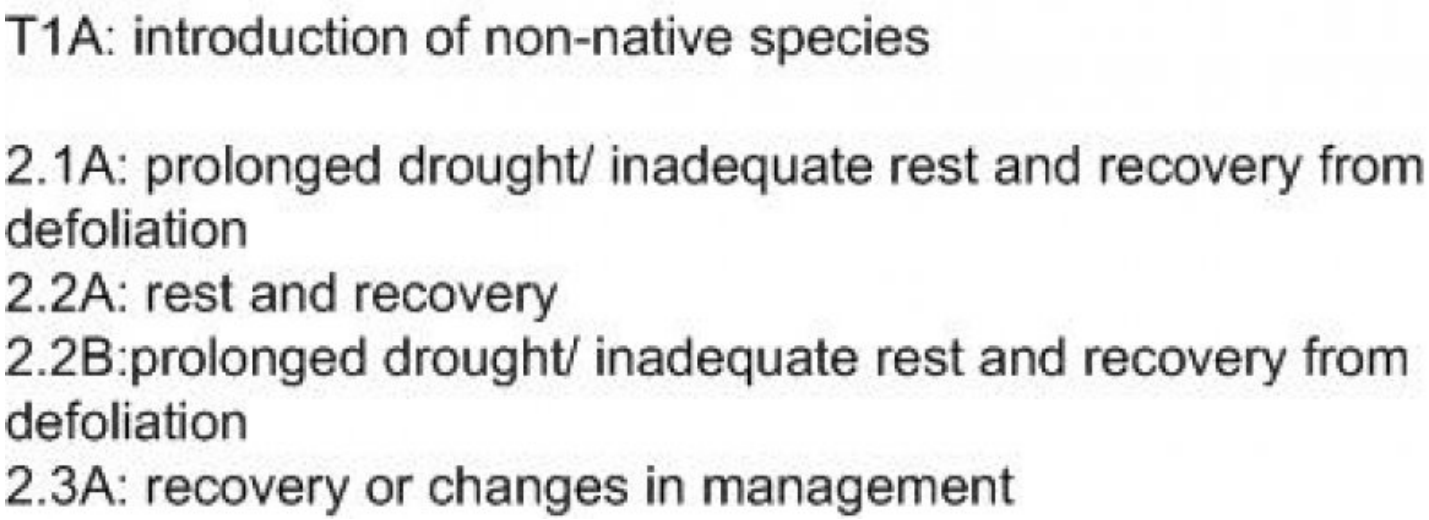

Figure 4. DRAFT STM LEGEND

State 1
Reference State

Community 1.1
Reference Plant Community

The reference plant community is dominated by black greasewood, and inland saltgrass. Vegetation on this site is normally restricted to coppice mound areas that are surrounded by playa-like depressions. Potential vegetative composition is about 20% grasses, 5% forbs, and 75% shrubs. Approximate ground cover (basal and crown) is 10

to 20 percent.

Table 5. Annual production by plant type

Plant Type	Low (Lb/Acre)	Representative Value (Lb/Acre)	High (Lb/Acre)
Shrub/Vine	75	188	338
Grass/Grasslike	20	50	90
Forb	5	12	22
Total	**100**	**250**	**450**

State 2
Current Potential

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**			15–60	
	saltgrass	DISP	*Distichlis spicata*	10–40	–
	alkali sacaton	SPAI	*Sporobolus airoides*	5–20	–
2	**Secondary Perennial Grasses**			10–25	
	Indian ricegrass	ACHY	*Achnatherum hymenoides*	1–8	–
	squirreltail	ELEL5	*Elymus elymoides*	1–8	–
	basin wildrye	LECI4	*Leymus cinereus*	1–8	–
	bluegrass	POA	*Poa*	1–8	–
Forb					
3	**Perennial**			5–20	
	basin wildrye	LECI4	*Leymus cinereus*	1–8	–
4	**Annual**			1–14	
	Indian ricegrass	ACHY	*Achnatherum hymenoides*	1–8	–
	squirreltail	ELEL5	*Elymus elymoides*	1–8	–
	bluegrass	POA	*Poa*	1–8	–
Shrub/Vine					
5	**Primary Shrubs**			235–325	
	greasewood	SAVE4	*Sarcobatus vermiculatus*	225–290	–
	Parry's saltbush	ATPA3	*Atriplex parryi*	2–13	–
	shadscale saltbush	ATCO	*Atriplex confertifolia*	3–12	–
	seepweed	SUAED	*Suaeda*	5–10	–
6	**Secondary Shrubs**			10–40	
	fourwing saltbush	ATCA2	*Atriplex canescens*	3–8	–
	Torrey's saltbush	ATTO	*Atriplex torreyi*	3–8	–
	green molly	BAAM4	*Bassia americana*	3–8	–
	whiteflower rabbitbrush	CHAL9	*Chrysothamnus albidus*	3–8	–
	rubber rabbitbrush	ERNAN5	*Ericameria nauseosa ssp. nauseosa var. nauseosa*	3–8	–
	spiny hopsage	GRSP	*Grayia spinosa*	3–8	–
	horsebrush	TETRA3	*Tetradymia*	3–8	–

Animal community

Livestock Interpretations:
This site has limited value for livestock grazing due to low forage production. 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 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. Alkali sacaton is a valuable forage species in arid and semiarid regions. Plants are tolerant to moderate grazing and can produce abundant herbage utilized by livestock. Black greasewood is an important winter browse plant for domestic sheep and cattle. It also receives light to moderate use by domestic sheep and cattle during spring and summer months. Black greasewood contains soluble sodium and potassium oxalates that may cause poisoning and death in domestic sheep and cattle if large amounts are consumed in a short time. Shadscale and Parry's saltbush is a

valuable browse species, providing a source of palatable, nutritious forage for a wide variety of livestock. Shadscale and Parry's saltbush provides good browse for domestic sheep. Shadscale and Parry's saltbush leaves and seeds are an important component of domestic sheep and cattle winter diets.

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:
Black greasewood is an important winter browse plant for big game animals and a food source for many other wildlife species. It also receives light to moderate use by mule deer and pronghorn during spring and summer months. Shadscale and Parry's saltbush are 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. They supply browse, seed, and cover for birds, small mammals, rabbits, deer, and pronghorn antelope. 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. 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.

Hydrological functions

Runoff is low to very high.

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

The leaves, seeds and stems of black greasewood are edible. Black greasewood is useful for stabilizing soil on wind-blown areas. It successfully revegetates processed oil shale and is commonly found on eroded areas and sites too saline for most plant species. Seeds of shadscale were used by Native Americans for bread and mush.

Other information

Given its extensive system of rhizomes and roots which form a dense sod, saltgrass is considered an outstanding species for controlling wind and water erosion. 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.

Type locality

Location 1: Esmeralda County, NV	
Township/Range/Section	T3N R36E S14
Latitude	38° 7′ 0″
Longitude	117° 56′ 23″
General legal description	N1/2 Section 14, T3N. R36E. MDBM. About 1 mile east of US Highway 95, Columbus Salt Marsh area, Esmeralda County, Nevada. This site also occurs in Lincoln, Mineral and Nye Counties, Nevada.

Other references

Fire Effects Information System (Online; http://www.fs.fed.us/database/feis/plants/).

Contributors

RRK

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)	Patti Novak-Echenique
Contact for lead author	State Rangeland Management Specialist
Date	07/19/2013
Approved by	
Approval date	
Composition (Indicators 10 and 12) based on	Annual Production

Indicators

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

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2. **Presence of water flow patterns:** Water flow patterns are rare to common dependent on location relative to major inflow areas. Water flow patterns are typically short, ending in depressional areas where water ponds. Moderately fine to fine surface textures and physical crusts result in limited infiltration rates. Concentrations of surface salts and sodium result in chemical crusts which also impede precipitation infiltration.

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3. **Number and height of erosional pedestals or terracettes:** None

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4. **Bare ground from Ecological Site Description or other studies (rock, litter, lichen, moss, plant canopy are not bare ground):** Bare Ground >50%

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

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6. **Extent of wind scoured, blowouts and/or depositional areas:** None

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7. **Amount of litter movement (describe size and distance expected to travel):** Fine litter (foliage of grasses and annual & perennial forbs) expected to move distance of slope length during periods of intense summer convection storms. Persistent litter (large woody material) will remain in place.

8. **Soil surface (top few mm) resistance to erosion (stability values are averages - most sites will show a range of values):** Soil stability values will range from 1 to 4. (To be field tested.)

9. **Soil surface structure and SOM content (include type of structure and A-horizon color and thickness):** Soil surface structure is typically platy or single grained. The surface horizon typically has many fine vesicular pores. Soil surface colors are pale browns and are typified by an ochric epipedon. Organic matter is typically less than 1 percent.

10. **Effect of community phase composition (relative proportion of different functional groups) and spatial distribution on infiltration and runoff:** In areas with cover (sparse) of deep-rooted perennial herbaceous bunchgrasses (basin wildrye) and/or rhizomatous grasses (salt grass) slow runoff and increase infiltration.

11. **Presence and thickness of compaction layer (usually none; describe soil profile features which may be mistaken for compaction on this site):** Compacted layers are none. Platy or massive subsurface layers are normal for this site and are not to be interpreted as compaction.

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: Tall shrubs (black greasewood) > rhizomatous perennial grasses (saltgrass)

    Sub-dominant: associated shrubs > deep-rooted, warm season, perennial bunchgrasses > deep-rooted, cool season, perennial forbs> deep-rooted, cool season, perennial bunchgrasses > shallow-rooted, cool season, perennial bunchgrasses > annual forbs

    Other: biological crusts

    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 35% of total woody canopy

14. **Average percent litter cover (%) and depth (in):** Between plant interspaces 10-15% and depth of litter is <¼ inch.

15. **Expected annual annual-production (this is TOTAL above-ground annual-production, not just forage annual-production):** For normal or average growing season (thru June) ±250 lbs/ac; Favorable years ± 450 lbs/ac and unfavorable years ± 100 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 include annual mustards,; Russian thistle, halogeton and cheatgrass

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17. **Perennial plant reproductive capability:** All functional groups should reproduce in average (or normal) and above average growing season years. Reduced growth and reproduction occurs during extreme or extended drought periods.
