USDA Natural Resources
Conservation Service

Ecological site R028AY104NV
DRY SALINE MEADOW

Last updated: 6/12/2025
Accessed: 01/17/2026

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.

MLRA notes

Major Land Resource Area (MLRA): 028A–Ancient Lake Bonneville

MLRA 28A occurs in Utah (82%), Nevada (16%), and Idaho (2%). It makes up about 36,775 square miles. A large area west and southwest of Great Salt Lake is a salty playa. This area is the farthest eastern extent of the Great Basin Section of the Basin and Range Province of the Intermontane Plateaus. It is an area of nearly level basins between widely separated mountain ranges trending north to south. The basins are bordered by long, gently sloping alluvial fans. The mountains are uplifted fault blocks with steep side slopes. They are not well dissected because of low rainfall in the MLRA. Most of the valleys are closed basins containing sinks or playa lakes. Elevation ranges from 3,950 to 6,560 ft. in the basins and from 6,560 to 11,150 ft. in the mountains. Most of this area has alluvial valley fill and playa lakebed deposits at the surface. Great Salt Lake is all that remains of glacial Lake Bonneville. A level line on some mountain slopes indicates the former extent of this glacial lake. Most of the mountains in the interior of this area consist of tilted blocks of marine sediments from Cambrian to Mississippian age. Scattered outcrops of Tertiary continental sediments and volcanic rocks are throughout the area. The average annual precipitation is 5 to 12 ins. in the valleys and is as much as 49 ins. in the mountains. Most of the rainfall occurs as high-intensity, convective thunderstorms during the growing season. The driest period is from midsummer to early autumn. Precipitation in winter typically occurs as snow. The average annual temperature is 39 to 53 °F. The freeze-free period averages 165 days and ranges from 110 to 215 days, decreasing in length with elevation. The dominant soil orders in this MLRA are Aridisols, Entisols, and Mollisols. The soils in the area dominantly have a mesic or frigid soil temperature regime, an aridic or xeric soil moisture regime, and mixed mineralogy. They generally are well drained, loamy or loamy-skeletal, and very deep.

Ecological site concept

This site occurs on lakeplain terraces. Slope ranges from 0 to 4 percent. Elevations are 5400 to 6000 feet.

The climate associated with this site is semiarid, characterized by cool, moist winters and warm, dry summers. Average annual precipitation is 6 to about 10 inches. Mean annual air temperature is to 45 to 50 degrees F. The average growing season is about 100 to 120 days.

The soils associated with this site are very deep and moderately well drained. These soils are strongly salt and sodium affected in the upper profile. The soils have a water table near 42 inches for short periods during the late winter or early spring that usually stabilizes below 60 inches during the summer.

The reference plant community is dominated by alkali cordgrass, alkaligrass, and King"s ivesia. Where Rocky Mountain juniper occurs on the site, tree canopy cover is less than 15 percent. Approximate ground cover (basal and crown) is 8 to 15 percent.

Associated sites

R028AY105NV	**SALINE MEADOW** Saline Meadow
R028AY106NV	**SALINE BOTTOM** Saline Bottom
R028BY020NV	**SODIC FLAT 5-8 P.Z.** Sodic Flat 5-8" PZ PLAYA

Similar sites

R028AY106NV	**SALINE BOTTOM** Saline Bottom. SPAI-LECI4 codominant; more productive site.
R028AY105NV	**SALINE MEADOW** Saline Meadow. SPAI dominant plant; more productive site.
R028BY002NV	**SALINE MEADOW** Saline Meadow. More productive site; JUSC2 absent.
R028AY046NV	**WET SODIC BOTTOM** Wet Sodic Bottom. DISP dominant plant; more productive site.

Table 1. Dominant plant species

Tree	Not specified
Shrub	Not specified

Herbaceous	(1) *Spartina gracilis* (2) *Puccinellia*

Physiographic features

This site occurs on lakeplain terraces. Slope ranges from 0 to 4 percent. Elevations are 5400 to 6000 feet.

Table 2. Representative physiographic features

Landforms	(1) Lake plain
Ponding duration	Long (7 to 30 days)
Ponding frequency	Rare to occasional
Elevation	1,646–1,829 m
Slope	0–4%
Ponding depth	0–15 cm
Water table depth	145–183 cm
Aspect	Aspect is not a significant factor

Climatic features

Nevada’s climate is predominantly arid, with large daily ranges of temperature, infrequent severe storms, heavy snowfall in the higher mountains, and great location variations with elevation. Three basic geographical factors largely influence Nevada’s climate: continentality, latitude, and elevation. Continentality is the most important factor. The strong continental effect is expressed in the form of both dryness and large temperature variations. Nevada lies on the eastern, lee side of the Sierra Nevada Range, a massive mountain barrier that markedly influences the climate of the State. The prevailing winds are from the west, and as the warm moist air from the Pacific Ocean ascend the western slopes of the Sierra Range, the air cools, condensation occurs and most of the moisture falls as precipitation. As the air descends the eastern slope, it is warmed by compression, and very little precipitation occurs. The effects of this mountain barrier are felt not only in the West but throughout the state, with the result that the lowlands of Nevada are largely desert or steppes. The temperature regime is also affected by the blocking of the inland-moving maritime air. Nevada sheltered from maritime winds, has a continental climate with well-developed seasons and the terrain responds quickly to changes in solar heating. Nevada lies within the mid-latitude belt of prevailing westerly winds which occur most of the year. These winds bring frequent changes in weather during the late fall, winter and spring months, when most of the precipitation occurs. To the south of the mid-latitude westerlies, lies a zone of high pressure in subtropical latitudes, with a center over the Pacific Ocean. In the summer, this high-pressure belt shifts northward over the latitudes of Nevada, blocking storms from the ocean. The resulting weather is mostly clear and dry

during the summer and early fall, with scattered thundershowers. The eastern portion of the state receives significant summer thunderstorms generated from monsoonal moisture pushed up from the Gulf of California, known as the North American monsoon. The monsoon system peaks in August and by October the monsoon high over the Western U.S. begins to weaken and the precipitation retreats southward towards the tropics (NOAA 2004).

The climate associated with this site is semiarid, characterized by cool, moist winters and warm, dry summers. Average annual precipitation is 6 to about 10 inches. Mean annual air temperature is to 45 to 50 degrees F. The average growing season is about 100 to 120 days.

Mean annual precipitaion at the LUND, NEVADA climate station (264745) is 10.04 inches.

January 0.78; February 0.85; March 1; April 0.98: May 0.95; June 0.82; July 0.69; August 0.87; September 0.77; October 0.92;
November 0.69; December 0.73.

Table 3. Representative climatic features

Frost-free period (average)	120 days
Freeze-free period (average)	
Precipitation total (average)	254 mm

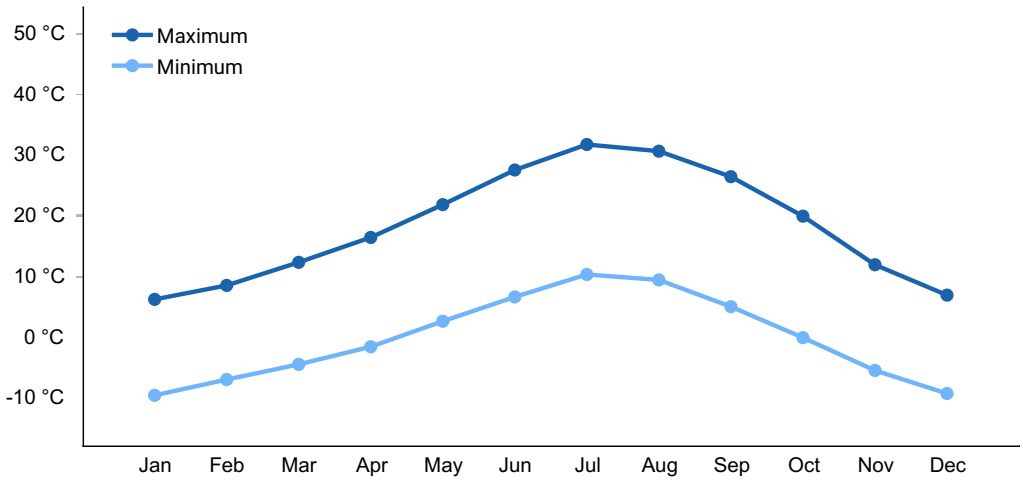


Figure 1. Monthly average minimum and maximum temperature

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 moderately well drained. These soils are strongly salt and sodium affected in the upper profile. The soils have a water table near 42 inches for short periods during the late winter or early spring that usually stabilizes below 60 inches during the summer. Capillary moisture from the shallow water table enhances soil moisture in that part of the soil profile below the surface layer. Runoff is high and water may pond in some areas for short periods. The soil series associated with this site include: Ewelac.

Table 4. Representative soil features

Surface texture	(1) Silty clay
Family particle size	(1) Clayey
Drainage class	Moderately well drained
Permeability class	Slow
Soil depth	152–213 cm
Surface fragment cover <=3"	0%
Surface fragment cover >3"	0%
Available water capacity (0-101.6cm)	15.75–16 cm
Calcium carbonate equivalent (0-101.6cm)	25–35%
Electrical conductivity (0-101.6cm)	0–16 mmhos/cm
Sodium adsorption ratio (0-101.6cm)	13–90
Soil reaction (1:1 water) (0-101.6cm)	9.1–9.6
Subsurface fragment volume <=3" (Depth not specified)	0%
Subsurface fragment volume >3" (Depth not specified)	0%

Ecological dynamics

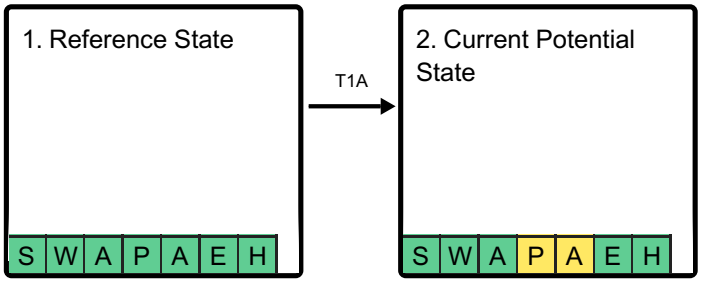
As ecological condition declines, ivesia and rabbitbrush increase. Rocky Mountain juniper often occurs on this site. In the absence of periodic, natural, wildfire, the tree canopy may exceed 30 percent. As juniper canopy increases, understory production decreases. Halogeton is the species most likely to invade this site.

Fire Ecology:

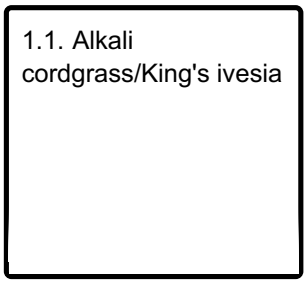
Alkali cordgrass has high fire tolerance. Alkali cordgrass grows in areas that do not burn regularly due to the high moisture content of the plant community. Baltic rush is fire tolerant when dormant and top-killed by fire during the growing season. It establishes after fire through seed and/or lateral spread by rhizomes.

State and transition model

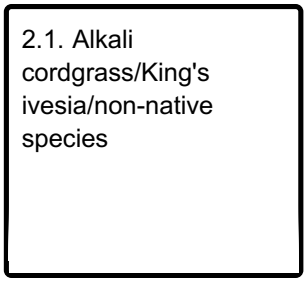
Ecosystem states



State 1 submodel, plant communities



State 2 submodel, plant communities



State 1
Reference State

This state is maintained by fires that occur regularly to reduce juniper invasion. The dominant herbaceous species are tolerant of fires and return readily in the community after a fire.

Community 1.1
Alkali cordgrass/King's ivesia

The reference plant community is dominated by alkali cordgrass, alkaligrass, and King's ivesia. Where Rocky Mountain juniper occurs on the site, tree canopy cover is less than 15 percent. Approximate ground cover (basal and crown) is 8 to 15 percent.

Table 5. Annual production by plant type

Plant Type	Low (Kg/Hectare)	Representative Value (Kg/Hectare)	High (Kg/Hectare)
Grass/Grasslike	211	336	504
Forb	41	67	101
Tree	13	22	34
Shrub/Vine	15	22	34
Total	**280**	**447**	**673**

State 2
Current Potential State

The Current Potential State is similar to the Reference State. This state includes non-natives species in the plant community.

Community 2.1
Alkali cordgrass/King's ivesia/non-native species

The 2.1 plant community is dominated by alkali cordgrass, alkaligrass, and King's ivesia. Where Rocky Mountain juniper occurs on the site, tree canopy cover is less than 15 percent. Approximate ground cover (basal and crown) is 8 to 15 percent. The plant community also includes non-native species.

Transition T1A
State 1 to 2

Introduction of non-native plant species.

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/Grasslikes**			121–215	
	alkali cordgrass	SPGR	*Spartina gracilis*	67–112	–
	alkaligrass	PUCCI	*Puccinellia*	45–67	–
2	**Secondary Perennial Grasses/Grasslikes**			22–67	
	sedge	CAREX	*Carex*	2–13	–

	saltgrass	DISP	*Distichlis spicata*	2–13	–
	basin wildrye	LECI4	*Leymus cinereus*	2–13	–
	scratchgrass	MUAS	*Muhlenbergia asperifolia*	2–13	–
	mat muhly	MURI	*Muhlenbergia richardsonis*	2–13	–
	western wheatgrass	PASM	*Pascopyrum smithii*	2–13	–
	alkali sacaton	SPAI	*Sporobolus airoides*	2–13	–
	arrowgrass	TRIGL	*Triglochin*	2–13	–
Forb					
3	**Primary Perennial Forbs**			22–45	
	King's mousetail	IVKI	*Ivesia kingii*	22–45	–
4	**Secondary Perennial Forbs**			9–36	
	milkvetch	ASTRA	*Astragalus*	2–9	–
	horsetail	EQUIS	*Equisetum*	2–9	–
	Rocky Mountain iris	IRMI	*Iris missouriensis*	2–9	–
Shrub/Vine					
5	**Primary Shrubs**			9–45	
	shadscale saltbush	ATCO	*Atriplex confertifolia*	4–13	–
	whiteflower rabbitbrush	CHAL9	*Chrysothamnus albidus*	4–13	–
	rubber rabbitbrush	ERNAO	*Ericameria nauseosa ssp. consimilis var. oreophila*	4–13	–
	rock willow	SAVE	*Salix vestita*	4–13	–
Tree					
6	**Evergreen**			1–36	
	Rocky Mountain juniper	JUSC2	*Juniperus scopulorum*	1–36	–

Animal community

Livestock Interpretations:
This site is suitable for livestock grazing. Grazing management should be keyed to perennial grass production. Palatability for alkali cordgrass is low for livestock. Baltic rush is described as a fair to good forage species for cattle. On average, Baltic rush palatability is considered medium to moderately low. Baltic rush is considered palatable early in the

growing season when plants are young and tender, but as stems mature and toughen palatability declines.
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:
Perennial grass species are important forage species for several wildlife species. Palatability for alkali cordgrass is low for wildlife. Baltic rush provides food for several wildlife species and waterfowl. Baltic rush is an important cover species for a variety of small birds, upland game birds, birds of prey, and waterfowl.

Hydrological functions

Runoff is high. Permeability is slow. Hydrologic soil group is 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 has potential for upland and big game hunting.

Other products

The stems of Baltic rush were historically used by Native Americans as a foundation for coiled basketry.

Other information

Baltic rush's production of deep and fibrous roots originating from a mass of coarse and creeping rhizomes makes it a valuable species for stabilizing streambanks and protecting against soil erosion.

Type locality

Location 1: White Pine County, NV	
Township/Range/Section	T15N R67E S29
UTM zone	N
UTM northing	718163
UTM easting	4334927

Latitude	39° 8′ 10″
Longitude	-114° 28′ 33″
General legal description	About 6 miles north of USHwy 50, South Bastion Spring area, Spring Valley, White Pine County, Nevada. This site also occurs in Elko and Nye Counties, Nevada.

Other references

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

Houghton, J.G., C.M. Sakamoto, and R.O. Gifford. 1975. Nevada's Weather and Climate, Special Publication 2. Nevada Bureau of Mines and Geology, Mackay School of Mines, University of Nevada, Reno, NV.

National Oceanic and Atmospheric Administration. 2004. The North American Monsoon. Reports to the Nation. National Weather Service, Climate Prediction Center. Available online: http://www.weather.gov/

USDA-NRCS Plants Database (Online; http://www.plants.usda.gov).

Contributors

DBP

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	05/15/2013
Approved by	Kendra Moseley
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:** Rare to numerous in areas where inflow occurs onto the lake plain.

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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 >60%

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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) only expected to move during run-in from adjacent landscapes. Persistent litter (large woody material) will remain in place excessive run-in.

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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 2 to 4. (This will be field tested.)

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9. **Soil surface structure and SOM content (include type of structure and A-horizon color and thickness):** Soil surface structure is subangular blocky. Soil surface colors are dark grayish browns and soils have an ochric epipedon. Organic matter is < 1 percent in the upper 10 inches.

10. **Effect of community phase composition (relative proportion of different functional groups) and spatial distribution on infiltration and runoff:** Deep-rooted perennial herbaceous grasses and grass-likes slow runoff and increase infiltration. Perennial grasses and associated litter break raindrop impact and slow overland flow.

11. **Presence and thickness of compaction layer (usually none; describe soil profile features which may be mistaken for compaction on this site):** None – Subsurface subangular blocky structure is 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: Reference State: Rhizomatous, warm season, perennial grasses

    Sub-dominant: warm season, perennial bunchgrasses > grass-like plants > deep-rooted, cool season, perennial forbs > shrubs

    Other: evergreen trees, tall deep-rooted cool-season grasses

    Additional:

13. **Amount of plant mortality and decadence (include which functional groups are expected to show mortality or decadence):** Herbaceous plant mortality or decadence uncommon. Shrubs may exhibit some mortality (<30%) with excessive ponding or drought.

14. **Average percent litter cover (%) and depth (in):** Within plant interspaces (10-20%) and depth < 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 July) ± 400 lbs/ac; Favorable years ±600 lbs/ac and unfavorable years 250 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 halogeton, Russian thistle, and salt cedar

17. **Perennial plant reproductive capability:** All functional groups should reproduce in most years. Reduced growth and reproduction will occur in drought years.