

Ecological site R027XY090NV

DRY SALINE MEADOW

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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.

MLRA notes

Major Land Resource Area (MLRA): 027X–Fallon-Lovelock Area

Physiography Found in the Great Basin Section of the Basin and Range Province of the Intermontane Plateaus this area is characterized by isolated uplifted fault block mountain ranges trending north to south that are separated by broad, hydrologically closed basins. The entire area occurs in the rain-shadow of the Sierra Nevada mountains and is influenced by Pleistocene Lake Lahontan which reached its most recent high stand about 12,000 years ago. There is substantial evidence suggesting the western Great Basin has been the site of pluvial-interpluvial cycles for at least the past two million years. The mountains and valleys are dissected by the Humboldt, Truckee, Carson, and Walker Rivers and their tributaries, all of which terminate within MLRA 27. Extensive playas can be found throughout this area and are the result of drying of ancient Lake Lahontan. Elevation generally ranges from 3,300 to 5,900 feet (1,005 to 1,800 meters) in valleys, but on some mountain peaks it is more than 7,870 feet (2,400 meters). **Geology** Landforms and soils of this MLRA have been heavily influenced by fluctuating lake level over the last 40,000 years. There is a level line evident on the higher slopes marking the former extent of glacial Lake Lahontan. Almost half of this area has surface deposits of alluvial valley fill influenced by lacustrine sediment. The rest has andesite and basalt rocks of different ages. Mesozoic and Tertiary intrusives are concentrated along the western border of the area, and Lower Volcanic Rocks (17 to 43 million years old) are common on the eastern side of the area. Also, some scattered outcrops of Mesozoic sedimentary and volcanic rocks and tuffaceous sedimentary rocks are in the mountains within the interior of this MLRA. **Climate** The average annual precipitation is 5 to 10 inches (125 to 255 millimeters) in most of the area but is as much as 19 inches (485 millimeters) on high mountain slopes. Most of the rainfall occurs as high-intensity, convective thunderstorms during the growing season. The amount of precipitation is very low from summer to midautumn. The precipitation in winter occurs mainly as snow. The average annual temperature is 43 to 54 degrees F (6 to 12 degrees C). The freeze-free period averages 155 days and ranges from 110 to 195 days, decreasing in length with elevation. **Water** The amount of precipitation is very low, and water for irrigation is obtained principally from diversions on the four large rivers in the area and from water stored in the Lahontan, Rye Patch, and Weber Reservoirs. Pyramid Lake and Walker Lakes are terminal lakes for the Truckee and Walker Rivers, respectively. Much of the annual flow of both rivers is diverted for irrigation, causing lake levels to fall and levels of dissolved salts to increase causing problems for the native Lahontan cutthroat trout. **Soils** The dominant soil orders are Aridisols and Entisols. The soils in the area are predominantly a mesic temperature regime, aridic moisture regime, and have a mixed mineralogy. They are generally well drained, loamy or sandy, commonly skeletal, and shallow to very deep. Accumulation of salts, tufa deposits, and eolian sediments with soluble salts over lacustrine deposits influence most of the soils in the basin landforms of this MLRA. Soils on bedrock-controlled landforms are typically comprised of volcanic or tuffaceous sedimentary colluvium over residuum. **Biological Resources** This area supports extensive areas of salt-desert shrub vegetation. Shadscale and Bailey's greasewood are widespread, occurring both individually and together. Grasses are generally sparse, although Indian ricegrass is prominent, especially on the sandy soils. Fourwing saltbush, winterfat, spiny hopsage, wolfberry, ephedra, dalea, and bud sagebrush are common shrubs. Basin wildrye, creeping wildrye, alkali sacaton, saltgrass, black greasewood, rubber rabbitbrush, and big saltbush are important plants on saline bottom lands and terraces. A few marsh areas support cattail, bulrushes, sedges, and rushes. Big sagebrush, along with scattered Utah juniper and singleleaf pinyon, is associated with Thurber needlegrass, desert needlegrass, Sandberg bluegrass, and squirreltail on the higher elevation piedmont slopes and mountains.

Ecological site concept

The Dry Saline Meadow site occurs on stream terraces and axial-stream floodplains. Slopes are less than 2 percent. Elevations are 3700 to about 4300 feet. The soils are very deep and poorly to somewhat poorly drained. Soils are strongly salt and sodium affected. The water table is at or near the surface for short periods during the spring that usually stabilizes below 40 inches during the early summer.

Associated sites

R027XY089NV	SODIC BOTTOM Less productive site; less plant diversity
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Similar sites

R027XY005NV	SALINE MEADOW SPAI dominant grass; more productive site
R027XY069NV	WET MEADOW 4-8 P.Z. POJU dominant grass

Table 1. Dominant plant species

Tree	Not specified
Shrub	Not specified
Herbaceous	(1) <i>Distichlis spicata</i> (2) <i>Puccinellia</i>

Physiographic features

The Dry Saline Meadow site occurs on stream terraces and axial-stream floodplains. Slopes are less than 2 percent. Elevations are 3700 to about 4300 feet.

Table 2. Representative physiographic features

Landforms	(1) Flood plain (2) Stream terrace
Runoff class	Medium to high
Flooding duration	Long (7 to 30 days)
Flooding frequency	Frequent
Ponding duration	Long (7 to 30 days)
Ponding frequency	None to frequent
Elevation	1,130 – 1,310 m

Slope	0 %
Water table depth	60 – 120 cm
Aspect	Aspect is not a significant factor

Climatic features

The climate is arid with cool, moist winters and hot, dry summers. Average annual precipitation is 4 to 8 inches. Mean annual air temperature is 49 to 60 degrees F. The average growing season is about 100 to 190 days.

Table 3 Representative climatic features

Frost-free period (average)	190 days
Freeze-free period (average)	
Precipitation total (average)	200 mm

Influencing water features

This site is associated with axial-stream floodplains.

Soil features

The soils associated with this site are very deep and poorly to somewhat poorly drained. Soils are strongly salt and sodium affected. Available water capacity is very low to moderate. The water table is at or near the surface for short periods during the spring that usually stabilizes below 40 inches during the early summer. Capillary rise of this ground water enhances soil moisture through the mid-summer portion of the growing season. The soil series associated with this site includes: Carcity, Pelic, Stillwater, and Turupah.

Table 4. Representative soil features

Parent material	(1) Alluvium
Surface texture	(1) Gravelly sand (2) Silty clay loam (3) Sandy loam
Family particle size	(1) Loamy
Drainage class	Poorly drained to somewhat poorly drained
Permeability class	Very slow to rapid

Soil depth	180 – 210 cm
Surface fragment cover <=3"	0 – 10 %
Surface fragment cover >3"	Not specified
Available water capacity (0-101.6cm)	6.35 – 19.05 cm
Calcium carbonate equivalent (0-101.6cm)	0 – 10 %
Electrical conductivity (0-101.6cm)	0 – 30 mmhos/cm
Sodium adsorption ratio (0-101.6cm)	0 – 50
Soil reaction (1:1 water) (0-101.6cm)	7.4 – 9.6
Subsurface fragment volume <=3" (Depth not specified)	0 – 10 %
Subsurface fragment volume >3" (Depth not specified)	Not specified

Ecological dynamics

As ecological condition declines, saltgrass cover initially increases as other perennial grasses and grass-like plants decrease and the amount of salt-crusts, bare ground increases. Tamarisk, and annual forbs such as Kochia spp. and Russian thistle are species most likely to invade this site. Locations that are ponded for prolonged periods may be dominated by foxtail barley (*Hordeum jubatum*).

Fire Ecology:

There is very little fire frequency information available for saline meadow communities prior to presettlement times. It is estimated that fire may have occurred every 7-10 years.

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.

Lemmon's and Nuttall's alkaligrass have high fire tolerance due to their rhizomatous growth and infrequent fire.

State and transition model

Additional community tables

Table 5. Community 1.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production ()	Foliar Cover (%)
Grass/Grasslike					
1	Primary Perennial Grasses			2368-3129	
	saltgrass	DISP	<i>Distichlis spicata</i>	1429-1715	—
	Lemmon's alkaligrass	PULE	<i>Puccinellia lemmonii</i>	432-555	—
	Nuttall's alkaligrass	PUNU2	<i>Puccinellia nuttalliana</i>	432-555	—
	cosmopolitan bulrush	BOMA7	<i>Bolboschoenus maritimus</i>	38-152	—
2	Secondary Perennial Grasses			38-152	
	sedge	CAREX	<i>Carex</i>	10-57	—
	foxtail barley	HOJU	<i>Hordeum jubatum</i>	10-57	—
	basin wildrye	LECI4	<i>Leymus cinereus</i>	10-57	—
	western wheatgrass	PASM	<i>Pascopyrum smithii</i>	10-57	—
	common reed	PHAU7	<i>Phragmites australis</i>	10-57	—
	alkali sacaton	SPAI	<i>Sporobolus airoides</i>	10-57	—
	arrowgrass	TRIGL	<i>Triglochin</i>	10-57	—
Forb					
3	Perennial Forbs			0-95	
Shrub/Vine					
4	Secondary Shrubs			0-95	
	Torrey's saltbush	ATTO	<i>Atriplex torreyi</i>	10-19	—
	greasewood	SAVE4	<i>Sarcobatus vermiculatus</i>	10-19	—
	seepweed	SUAED	<i>Suaeda</i>	10-19	—

Table 6. Community 2.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production ()	Foliar Cover (%)
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Table 7. Community 2.2 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production ()	Foliar Cover (%)
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Table 8. Community 3.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production ()	Foliar Cover (%)
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Animal community

Livestock Interpretations: This site is suitable for livestock grazing. Grazing management should be keyed to inland saltgrass and alkaligrass. 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. Baltic rush is described as a fair to good forage species for cattle. On average, Baltic rush's 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. Alkaligrass has low palatability for livestock. Bulrush herbage production is high, but forage value is low. It is seldom grazed by livestock if other forage is available. If upland forage becomes limited and soil conditions dry, livestock may utilize bulrush. 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: 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. 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. Alkaligrass has low palatability for wildlife. The hard-coated seeds of bulrushes are one of the most important and most commonly used foods of ducks and of certain marshbirds and shorebirds. The stems and underground parts are eaten by muskrats and geese. Bulrushes also furnish important nesting cover for waterfowl as well as for marsh wrens and blackbirds and give concealing protection to muskrats, otters, raccoons and other animals.

Hydrological functions

Runoff is negligible to high. Permeability is very slow to rapid.

Other products

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

Other information

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. 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. Bulrush erosion control and short-term and long-term revegetation potential are rated as medium. Bulrush buffers wind and wave action on lakes and ponds, which may enhance the establishment of vegetation along shorelines.

Inventory data references

NASIS soil component data.

Type locality

Location 1: Churchill County, NV	
General legal description	This site also occurs in Lyon, Mineral and Pershing Counties, 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

TB/JG

Approval

Kendra Moseley, 6/03/2024

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	09/20/2026

Approved by	
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:
