

Ecological site R026XY036NV WET CLAY BASIN

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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): 026X–Carson Basin and Mountains

The area lies within western Nevada and eastern California, with about 69 percent being within Nevada, and 31 percent being within California. Almost all this area is in the Great Basin Section of the Basin and Range Province of the Intermontane Plateaus. Isolated north-south trending mountain ranges are separated by aggraded desert plains. The mountains are uplifted fault blocks with steep side slopes. Most of the valleys are drained by three major rivers flowing east across this MLRA. A narrow strip along the western border of the area is in the Sierra Nevada Section of the Cascade-Sierra Mountains Province of the Pacific Mountain System. The Sierra Nevada Mountains are primarily a large fault block that has been uplifted with a dominant tilt to the west. This structure leaves an impressive wall of mountains directly west of this area. This helps create a rain shadow affect to MLRA 26. Parts of this eastern face, but mostly just the foothills, mark the western boundary of this area. Elevations range from about 3,806 feet (1,160 meters) on the west shore of Pyramid Lake to 11,653 feet (3,552 meters) on the summit of Mount Patterson in the Sweetwater Mountains.

Valley areas are dominantly composed of Quaternary alluvial deposits with Quaternary playa or alluvial flat deposits often occupying the lowest valley bottoms in the internally drained valleys, and river deposited alluvium being dominant in externally drained valleys. Hills and mountains are dominantly Tertiary andesitic flows, breccias, ash flow tuffs, rhyolite tuffs or granodioritic rocks. Quaternary basalt flows are present in lesser amounts, and Jurassic and Triassic limestone and shale, and Precambrian limestone and dolomite are also present in very limited amounts. Also of limited extent are glacial till deposits along the east flank of the Sierra Nevada Mountains, the result of alpine glaciation.

The average annual precipitation in this area is 5 to 36 inches (125 to 915 millimeters), increasing with elevation. Most of the rainfall occurs as high-intensity, convective storms in spring and autumn. Precipitation is mostly snow in winter. Summers are dry. The average annual temperature is 37 to 54 degrees F (3 to 12 degrees C). The freeze-free period averages 115 days and ranges from 40 to 195 days, decreasing in length with elevation.

The dominant soil orders in this MLRA are Aridisols and Mollisols. The soils in the area dominantly have a mesic soil temperature regime, an aridic or xeric soil moisture regime, and mixed or smectitic mineralogy. They generally are well drained, are clayey or loamy and commonly skeletal, and are very shallow to moderately deep.

This area supports shrub-grass vegetation characterized by big sagebrush. Low sagebrush and Lahontan sagebrush occur on some soils. Antelope bitterbrush, squirreltail, desert needlegrass, Thurber needlegrass, and Indian ricegrass are important associated plants. Green ephedra, Sandberg bluegrass, Anderson peachbrush, and several forb species also are common. Juniper-pinyon woodland is typical on mountain slopes. Jeffrey pine, lodgepole pine, white fir, and manzanita grow on the highest mountain slopes. Shadscale is the typical plant in the drier parts of the area. Sedges, rushes, and moisture-loving grasses grow on the wettest parts of the wet flood plains and terraces. Basin wildrye, alkali sacaton, saltgrass, buffaloberry, black greasewood, and rubber rabbitbrush grow on the drier sites that have a high concentration of salts.

Some of the major wildlife species in this area are mule deer, coyote, beaver, muskrat, jackrabbit, cottontail, raptors, pheasant, chukar, blue grouse, mountain quail, and mourning dove. The species of fish in the area include trout and catfish. The Lahontan cutthroat trout in the Truckee River is a threatened and endangered species.

LRU notes

The "XY" LRU contains all the sites that cross other LRU boundaries. The sites are typically found along waterways.

Ecological site concept

This site occurs on nearly level lake plains. Slope gradients of 0 to 2 percent are most typical. Elevations are 5800 to 6000 feet. The soils associated with this site are derived from mixed alluvium. The soils in this site are very deep, dark colored and clayey. When dry, the soils are subject to extensive cracking that damages the root systems of many species of plants. The dry, cracked condition persists long enough in most years for appreciable surface sloughing to take place, and a hummocky (gilgai) relief is not produced. A seasonally high water table occurs within six feet of the surface in most years and the soils are typically ponded through most of the growing season. The dominant plant is povertyweed (*Iva axillaris*).

Associated sites

R026XY002NV	WET SODIC BOTTOM
R026XY037NV	CLAY BASIN
R026XY097NV	CHURNING CLAYPAN 8-10 P.Z.

Similar sites

R026XY037NV	CLAY BASIN A stable plant community, run-in water recedes yearly
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Table 1. Dominant plant species

Tree	Not specified
Shrub	Not specified
Herbaceous	(1) <i>Iva axillaris</i>

Physiographic features

This site occurs on nearly level lake plains. Slope gradients of 0 to 2 percent are most typical. Elevations are 5800 to 6000 feet.

Table 2. Representative physiographic features

Landforms	(1) Lake plain
Runoff class	High to very high
Flooding duration	Long (7 to 30 days)
Flooding frequency	None to occasional
Ponding duration	Very long (more than 30 days)
Ponding frequency	None to frequent
Elevation	5,800–6,000 ft
Slope	0–2%
Ponding depth	6–12 in
Water table depth	60–72 in

Aspect	Aspect is not a significant factor
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Climatic features

The climate associated with this site is semiarid, characterized by cool, moist winters and warm, dry summers. Average annual precipitation is 8 to 18 inches. Mean annual air temperature is 44 to 52 degrees F. The average growing season is about 60 to 140 days.

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).

Table 3. Representative climatic features

Frost-free period (characteristic range)	
Freeze-free period (characteristic range)	
Precipitation total (characteristic range)	8-18 in
Frost-free period (average)	100 days
Freeze-free period (average)	
Precipitation total (average)	13 in

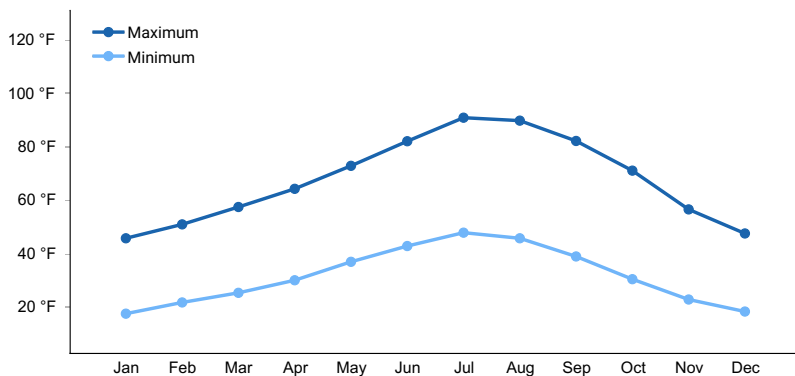


Figure 1. Monthly average minimum and maximum temperature

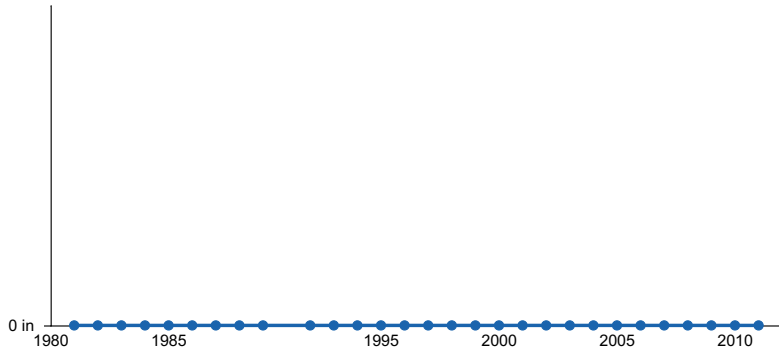


Figure 2. Annual precipitation pattern

Influencing water features

This site is associated with streams and playas and receives additional moisture during spring runoff and convective summer storms.

Soil features

The soils associated with this site are derived from mixed alluvium. The soils in this site are very deep, dark colored and clayey. When dry, the soils are subject to extensive cracking that damages the root systems of many species of plants. The dry, cracked condition persists long enough in most years for appreciable surface sloughing to take place, and a hummocky (gilgai) relief is not produced. A seasonally high water table occurs within six feet of the surface in most years and the soils are typically ponded through most of the growing season. Soil series associated with this site include Pit and Updike.

Table 4. Representative soil features

Parent material	(1) Alluvium
Surface texture	(1) Silty clay loam (2) Clay
Family particle size	(1) Clayey
Drainage class	Poorly drained to moderately well drained
Permeability class	Very slow to slow
Soil depth	72–84 in
Surface fragment cover <=3"	0%
Surface fragment cover >3"	0%
Available water capacity (0-40in)	6.3–7.1 in
Calcium carbonate equivalent (0-40in)	0–10%
Electrical conductivity (0-40in)	0–5 mmhos/cm
Sodium adsorption ratio (0-40in)	0–25
Soil reaction (1:1 water) (0-40in)	6.6–9
Subsurface fragment volume <=3" (Depth not specified)	0%
Subsurface fragment volume >3" (Depth not specified)	0%

Ecological dynamics

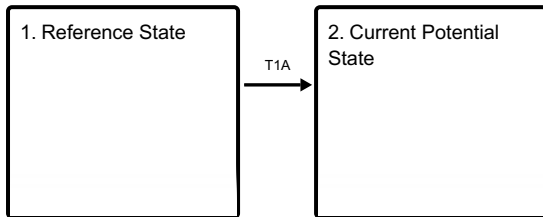
This is not a stable plant community. The site may be completely water covered during the growing season, or it can be a very productive site, dominated by annual forbs, in drier years.

Fire Ecology:

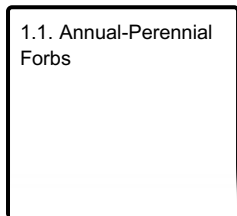
Spikerush is fire tolerant when dormant and usually top-killed during growing season. After fire spikerush will reestablish through seed or lateral spread of rhizomes. Baltic rush is fire tolerant when dormant and top-killed by fire during the growing season. It establishes after fire through seed and/or lateral spread by rhizomes.

State and transition model

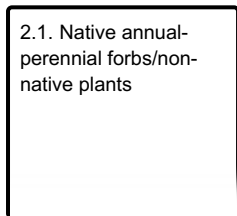
Ecosystem states



State 1 submodel, plant communities



State 2 submodel, plant communities



State 1 Reference State

The Reference State represent the site under natural disturbance regime. The water fluctuations can be variable on the site, which can make the vegetation communities vary from year to year.

Community 1.1 Annual-Perennial Forbs

The reference plant community is dominated by annual and perennial forbs, particularly poverty weed. These enclosed basins are generally flooded during much of the growing season. Potential vegetative composition is about 10 percent grasses, 85 percent forbs, and up to 5 percent shrubs. Approximate ground cover (basal and crown) is 0 to 80 percent.

Table 5. Annual production by plant type

Plant Type	Low (Lb/Acre)	Representative Value (Lb/Acre)	High (Lb/Acre)
Forb	0	680	2975
Grass/Grasslike	0	80	350
Shrub/Vine	0	40	175
Total	–	800	3500

State 2

Current Potential State

The Current Potential State is similar to the Reference State with the exception of non-native plants present in the plant community.

Community 2.1

Native annual-perennial forbs/non-native plants

Community is similar to 1.1, except non-native plants are established.

Transition T1A

State 1 to 2

Establishment of non-native plants.

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			48–120	
	sedge	CAREX	<i>Carex</i>	16–40	–
	spikerush	ELEOC	<i>Eleocharis</i>	16–40	–
2	Secondary Perennial Grasses			16–40	
	saltgrass	DISP	<i>Distichlis spicata</i>	4–24	–
	squirreltail	ELEL5	<i>Elymus elymoides</i>	4–24	–
	beardless wildrye	LETR5	<i>Leymus triticoides</i>	4–24	–
	mat muhly	MURI	<i>Muhlenbergia richardsonis</i>	4–24	–
	bluegrass	POA	<i>Poa</i>	4–24	–
Forb					
3	Primary Perennial Forbs			16–240	
	povertyweed	IVAX	<i>Iva axillaris</i>	16–240	–
	squirreltail	ELEL5	<i>Elymus elymoides</i>	4–24	–
	bluegrass	POA	<i>Poa</i>	4–24	–
4	Secondary Perennial Forbs			16–80	
	beardless wildrye	LETR5	<i>Leymus triticoides</i>	4–24	–
	mat muhly	MURI	<i>Muhlenbergia richardsonis</i>	4–24	–
	largeleaf pondweed	POAM5	<i>Potamogeton amplifolius</i>	4–24	–
	dock	RUMEX	<i>Rumex</i>	4–24	–
5	Annual Forbs			16–560	
	evening primrose	OENOT	<i>Oenothera</i>	4–24	–
Shrub/Vine					
6	Secondary Shrubs			24–72	
	silver sagebrush	ARCA13	<i>Artemisia cana</i>	8–24	–
	rubber rabbitbrush	ERNA10	<i>Ericameria nauseosa</i>	8–24	–
	currant	RIBES	<i>Ribes</i>	8–24	–

Animal community

Livestock Interpretations:

This site can be suitable for livestock grazing. Grazing management should be keyed towards Baltic rush. Baltic rush is described as a fair to good forage species for cattle. Spikerush has low palatability for livestock.

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:

Baltic rush has been identified in several studies as a source of food for several wildlife species. Mule deer utilize Baltic rush as a food source in the summer and fall throughout their range. Waterfowl eat the stems, roots, and achenes of spikerush.

Hydrological functions

Runoff is medium to very high. Premeability is very slow to slow.

Recreational uses

This site may offer opportunities for wildlife photographers when flooded.

Other products

The stems of Baltic rush were historically used by Native Americans for the construction of basketry. They may have also used the fine rootlets of Baltic rush to sew patterns on robes or other leather items.

Other information

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

Inventory data references

NASIS data from soil survey area NV773.

Type locality

Location 1: Storey County, NV	
Township/Range/Section	T18N R21E S27
UTM zone	N
UTM northing	436300
UTM easting	275500
General legal description	Virginia Range, Storey County, Nevada. This site also occurs in Washoe 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

DK/FR/GKB

Approval

Kendra Moseley, 4/10/2024

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	04/25/2024
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:**
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17. **Perennial plant reproductive capability:**
-